Scoping and Environmental Impact Assessment (S&EIA) Process for the Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

October 2025

Prepared for:
Genesis Eco-Energy Developments (Pty) Ltd

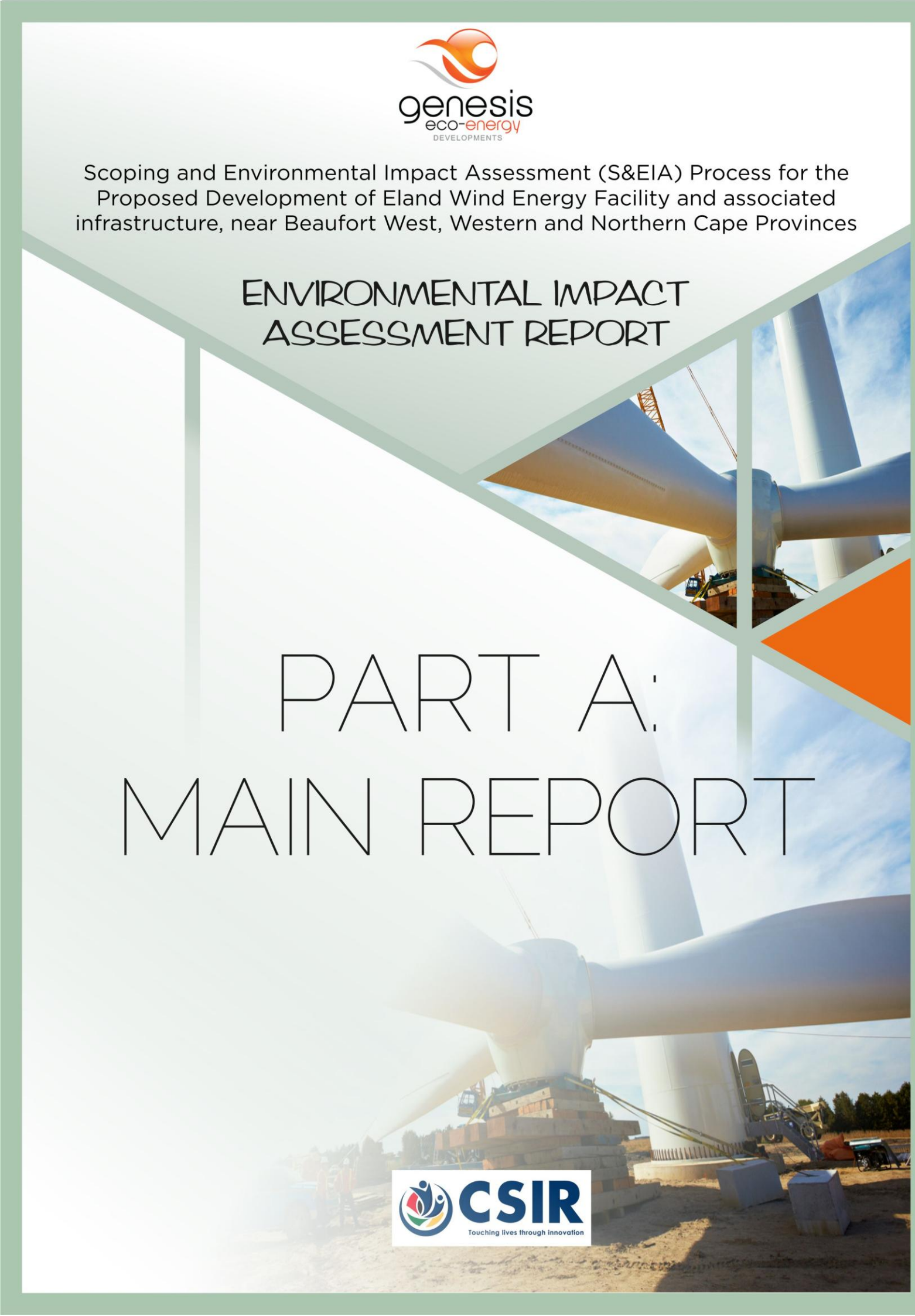
Prepared by:
Council for Scientific and Industrial Research (CSIR)

genesis eco-energy DEVELOPMENTS

Scoping and Environmental Impact Assessment (S&EIA) Process for the Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

PART A: MAIN REPORT



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SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT

for the

Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces

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October 2025

Prepared for:
Genesis Eco-Energy Developments (Pty) Ltd and Genesis Eland Wind Farm (Pty) Ltd

Prepared by:
Council for Scientific and Industrial Research (CSIR)

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REPORT DETAILS

Title:	Scoping and Environmental Impact Assessment (S&EIA) Process for the Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces: DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT
Purpose of this report:	The purpose of this Draft EIA Report is to: ▪ Present the details of and the need for the proposed project; ▪ Describe the affected environment at a sufficient level of detail based on specialist input to facilitate informed decision-making; ▪ Provide an overview of the EIA Process that has been followed, including public consultation; ▪ Provide an overview of 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 proposed project; and ▪ Provide an Environmental Management Programme (EMPr) for the relevant phases of the project. The Draft EIA Report is currently being released to all Interested and/or Affected Parties (I&APs), Organs of State and relevant stakeholders for a 30-day review period. All comments submitted during the 30-day review period will be incorporated and responded to in the Comments and Responses Report, which will be included as an appendix to the Final EIA Report, and addressed, as applicable and where relevant, in the Final EIA Report. The Final EIA Report will then be submitted to the National Department of Forestry, Fisheries and the Environment (DFFE) for decision-making.
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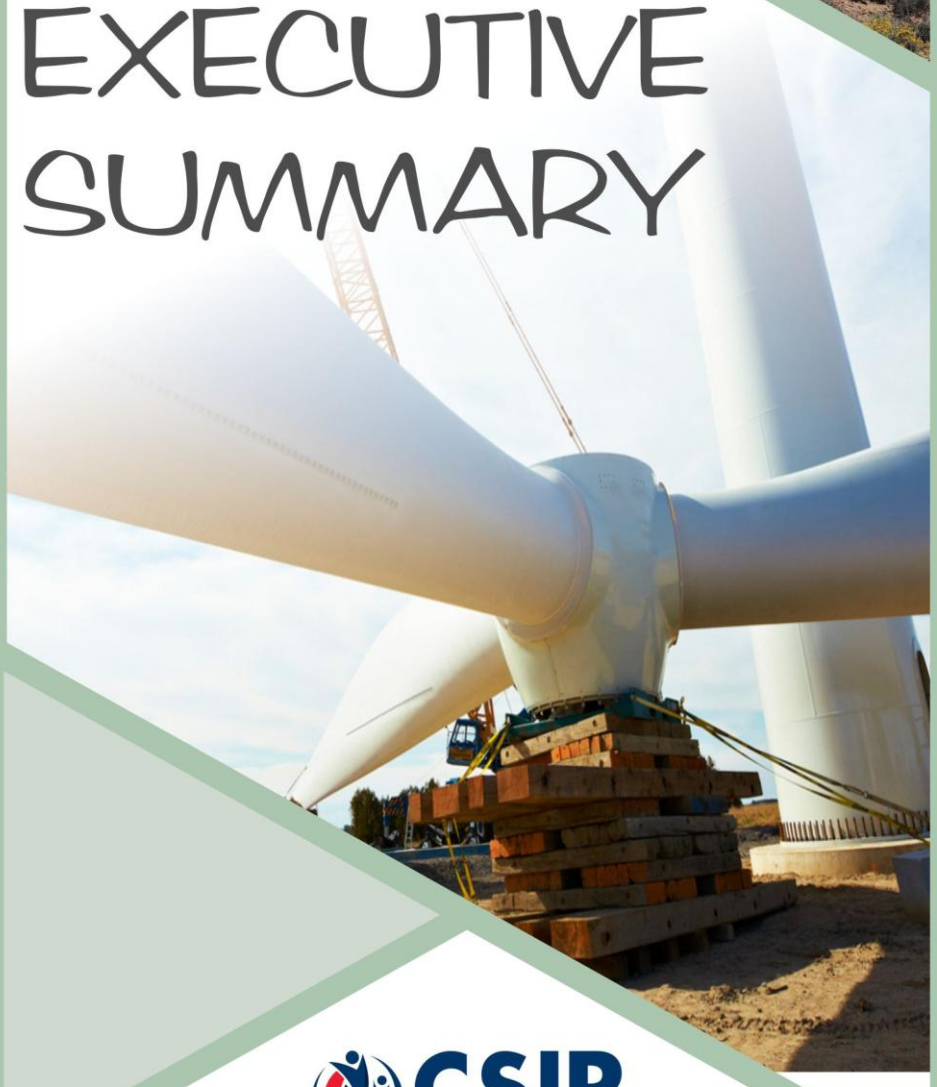
ENVIRONMENTAL IMPACT ASSESSMENT REPORT:

Scoping and Environmental Impact Assessment (S&EIA) Process for the Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces

EXECUTIVE SUMMARY



October 2025

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EXECUTIVE SUMMARY

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1. INTRODUCTION AND PROJECT LOCALITY

Genesis Eco-Energy Developments (Pty) Ltd (hereafter referred to as "GEED" or the "Project Developer") intends to develop a Renewable Energy Cluster consisting of two Solar Energy Facilities (SEFs) and various Wind Energy Facilities (WEFs), located near Beaufort West within the Beaufort West Local Municipality and the Central Karoo District Municipality in the Western Cape Province. The Renewable Energy Cluster comprises the Northern, Middle and Southern Clusters (Figure A and Table A). One of the WEFs within the Northern Cluster, namely the Eland WEF, also extends into the Karoo Hoogland and Ubuntu Local Municipalities in the Northern Cape Province.

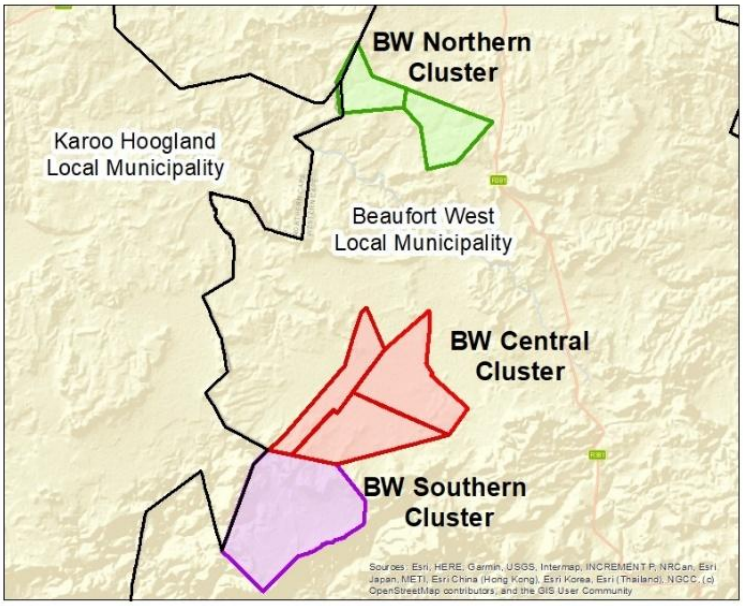


Figure A. GEED Renewable Energy Cluster, located predominantly in the Western Cape near Beaufort West.

The three clusters together with their respective project and applicant names, as well as the status of the relevant Environmental Assessment process, are denoted in Table A.

Table A. GEED Renewable Energy Cluster Proposed Projects, Applicants and Project Status

CLUSTER	PROJECT	APPLICANT	ENVIRONMENTAL ASSESSMENT PROJECT STATUS
Northern	Eland WEF, 132 kV EGI, BESS and associated infrastructure	Genesis Eland Wind Farm (Pty) Ltd	EIA currently underway
	Windy Plains WEF, BESS and associated infrastructure	Genesis Windy Plains Wind Farm (Pty) Ltd	EIA currently underway
Middle	Aloe WEF, 132 kV EGI, BESS and associated infrastructure	Genesis Aloe Wind Farm (Pty) Ltd	Pending (Pre-Application)
	Elegia WEF, 132 kV EGI, BESS and associated infrastructure	Genesis Elegia Wind Farm (Pty) Ltd	Pending (Pre-Application)
	Gazania WEF, 132 kV EGI, BESS and associated infrastructure	Genesis Gazania Wind Farm (Pty) Ltd	Pending (Pre-Application)
Southern	Beau Valley WEF, BESS and associated infrastructure	Genesis Beau Valley Wind Farm (Pty) Ltd	Pending (Pre-Application)
	Beau Valley SEF, 132 kV EGI, BESS and associated infrastructure	Genesis Beau Valley Solar Farm (Pty) Ltd	Authorised in December 2023
	DBF South WEF, 132 kV EGI, BESS and associated infrastructure	Genesis DBF South Wind Farm (Pty) Ltd	Will no longer be pursued
	DBF South SEF, 132 kV EGI, BESS and associated infrastructure	Genesis DBF South Solar Farm (Pty) Ltd	Authorised in November 2023
Supporting EGI	400 kV External Overhead Transmission Power Line and a 132/400 kV Collector Substation and Associated Infrastructure	Genesis Eco-Energy Developments (Pty) Ltd	Pending (Pre-Application)
	132 kV Windy Plains WEF External Overhead Transmission Power Line	Genesis Eco-Energy Developments (Pty) Ltd	Pending (Pre-Application)
	132 kV Beau Valley WEF Internal Overhead Transmission Power Line	Genesis Eco-Energy Developments (Pty) Ltd	Pending (Pre-Application)

Each of the SEF and WEF projects forming part of the GEED Renewable Energy Cluster require its own, separate Environmental Authorisation (EA) Application, and will undergo a separate Environmental Assessment process. As noted in Table A, the National Department of Forestry, Fisheries and the Environment (DFFE) granted EAs for the proposed Beau Valley SEF and DBF South SEF in 2023.

This Environmental Impact Assessment (EIA) Report only addresses the proposed **Genesis Eland WEF** (hereafter referred to as the "**Eland WEF**" or the "proposed project").

Note that the EIA Process for the proposed Windy Plains WEF is being undertaken concurrently with that of the Eland WEF, as both the WEFs form part of the Northern Cluster indicated in Figure A and Table A. The Windy Plains WEF is the subject of a separate EIA Report.

The proposed project is not located within any of the Renewable Energy Development Zones (REDZs) that were gazetted in GN 114 on 16 February 2018; and GN 144 on 26 February 2021. The proposed project is also not located within any of the Strategic Transmission Corridors that

were gazetted in GN 113 on 16 February 2018; and GN 1637 on 24 December 2021. Refer to Figure B for a locality map of the proposed Eland and Windy Plains WEFs.

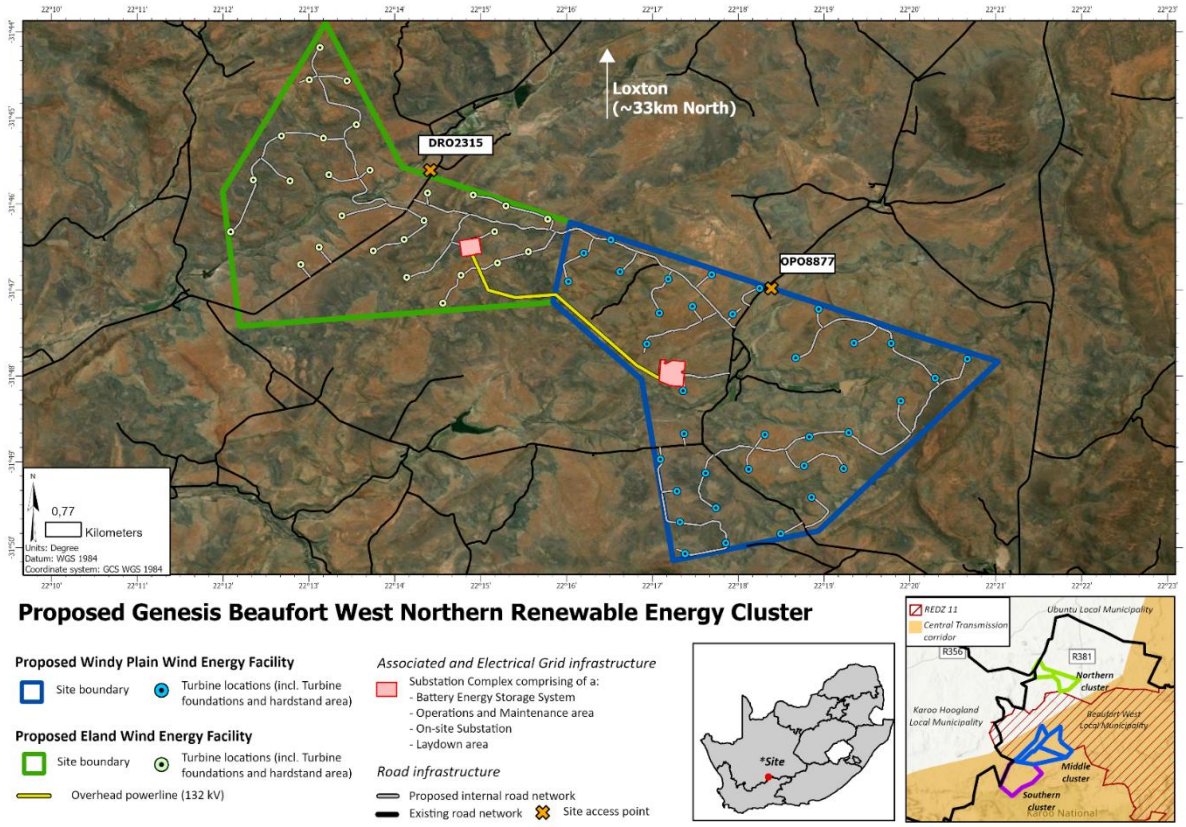


Figure B. Locality map of the GEED Northern Renewable Energy Cluster near Beaufort West in the Western and Northern Cape.

2. SUMMARY OF THE EA PROCESS TO DATE

The Final Scoping Reports for the Windy Plains and Eland WEFs (respective original DFFE Reference Numbers: 14/12/16/3/3/2/2424 and 14/12/16/3/3/2/2425) were accepted by the DFFE on 27 November 2023. The submission date of the Final EIA Reports for these WEFs was 08 April 2024. Based on various factors, the Final EIA Reports were not submitted by this date and therefore the original applications lapsed.

Regulation 21 of the 2014 National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) EIA Regulations (as amended), deals with the submission of Final Scoping Reports to the Competent Authority for consideration (i.e. acceptance or refusal). Specifically, Regulation 21 (2) of the 2014 NEMA EIA Regulations (as amended) states that subject to Regulation 46 and Regulation 21 (2) [(a) to (d)], and if the findings of the scoping report are still valid and the environmental context has not changed, the submission of a scoping report as contemplated in Regulation 21 (1) does not need to be complied with. In this regard, Regulation 46 is not relevant because the EA Applications for the Eland and Windy Plains WEFs were not refused, and no associated appeals were lodged. The applications only progressed until submission of the Final

Scoping Reports which were accepted by the DFFE. Regulation 21 (2) (a) to (d) of the 2014 NEMA EIA Regulations (as amended) are complied with, as described in detail in Chapter 1 of the EIA Report and the relevant specialist reports in Appendix G. As such, the Draft EIA Phase has been commenced with (without resubmitting the Draft and Final Scoping Reports), as also confirmed with the DFFE in September 2025.

It is important to note that a notification was sent via email on 16 September 2025 in terms of Regulation 21 (2) (b) of the 2014 NEMA EIA Regulations (as amended) to notify registered stakeholders of the intended resubmission of the applications for EA for the proposed Eland and Windy Plains WEFs, and the upcoming release of the Draft EIA Reports. A copy of this correspondence is included in Appendix E Part 3 of the EIA Report.

3. COMPETENT AUTHORITY AND APPLICANT

The Competent Authority for the proposed project is the DFFE, and the Project Applicant is Genesis Eland Wind Farm (Pty) Ltd.

4. NEED FOR THE EIA AND APPROACH

The proposed project triggers the need for an EA in terms of the 2014 NEMA EIA Regulations (as amended) published in GN R326, R327, R325 and R324 and further amended on 11 June 2021 in GN 517; and on 3 March 2022 in GN 1816. In terms of the 2014 NEMA EIA Regulations (as amended), a full Scoping and EIA Process is required for the proposed project.

Chapter 4 of the EIA Report contains a detailed list of activities, which are triggered by the proposed project and the various project components, and thus forms part of this Scoping and EIA Process. Listed below is the key listed activity that is triggered by the proposed project (Table B).

Table B. Key Listed Activity for the Eland WEF. Note that the remaining Listed Activities are included in Chapter 4 of the EIA Report.

Project	Listing Notice, Listed Activity and Description
Eland WEF	**GN R325 (Listing Notice 2), Activity 1:** The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facility or infrastructure is for photovoltaic installations and occurs (a) within an urban area; or (b) on existing infrastructure

The purpose of the Scoping and EIA Process is to identify, assess and report on any potential impacts the proposed project, if implemented, may have on the receiving environment. The Scoping and EIA therefore needs to show the Competent Authority and the Project Applicant 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.

5. PUBLIC PARTICIPATION PROCESS AND CURRENT EIA STAGE (I.E. RELEASE OF DRAFT EIA REPORT FOR 30-DAY COMMENT PERIOD)

The Public Participation Process (PPP) for this Scoping and EIA Process has been undertaken in compliance with Chapter 6 of the 2014 NEMA EIA Regulations (as amended). An integrated PPP is being undertaken for the proposed Eland and Windy Plains WEFs. The Draft Scoping Reports were made available to all Interested and/or Affected Parties (I&APs), Organs of State and relevant stakeholders for a 30-day comment period in September 2023 to October 2023, and the Final Scoping Reports were submitted to the DFFE in October 2023, and thereafter accepted in November 2023.

The Draft EIA Reports are currently being made available to all I&APs, Organs of State and relevant stakeholders for a 30-day review period. The Draft EIA Reports will be uploaded to the project website (i.e., https://www.csir.co.za/environmental-impact-assessment) and Google Drive for potential and registered I&APs to access it. Written notification of the availability of the Draft EIA Reports for comment will be sent to all stakeholders included on the project database via email, where email addresses were available. Various reminder emails will also be sent to the stakeholders during the comment period to seek comments.

Copies of all written comments received during the 30-day review period on the Draft EIA Report will be included as an appendix to the Final EIA Report. The comments will also be incorporated and responded to into a detailed Comments and Responses Report, which will also be appended to the Final EIA Report, and addressed, as applicable and where relevant, in the Final EIA Report. The Final EIA Report will thereafter be submitted to the DFFE, in accordance with Regulation 23 of the 2014 NEMA EIA Regulations (as amended), for decision-making.

6. PROJECT EIA TEAM

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), the Council for Scientific and Industrial Research (CSIR) was appointed by the Project Developer to undertake the required Scoping and EIA Process. The project team and the relevant specialists are indicated in Table C below.

Table C. Project Team for the Scoping and EIA Process

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
CSIR Environmental Management Services		
Paul Lochner *(Registered EAP (2019/745))*	CSIR	EAP, Technical Advisor and Quality Assurance
Rohaida Abed *(Pr.Sci.Nat. and Registered EAP (2021/4067))*	CSIR	Project Team Member
Helen Antonopoulos *(Cand.Sci.Nat.)*	CSIR	Project Manager
Dhiveshni Moodley *(Pr.Sci.Nat.)*	CSIR	GIS Specialist
Suvasha Ramcharan *(Cert.Sci.Nat.* and *Cand. EAP)*	CSIR	Project Officer
Sonto Mkize *(Cand. Planner)*	CSIR	Project Officer
Rinae Tsedu (*Cand. EAP)*	CSIR	Project Officer

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Kimara Moodley (*Cand. EAP)*	CSIR	Project Officer
Specialists		
Johann Lanz (*Pr.Sci.Nat.)* David Lakey	SoilZA	Agriculture Compliance Statement
Corné Niemandt[1] (*Pr.Sci.Nat.)*	Bios Diversitas Consultants	Terrestrial Biodiversity and Terrestrial Animal Species Impact Assessment and Terrestrial Plant Species Compliance Statement
Toni Belcher *(Pr.Sci.Nat.)*	Blue Science	Aquatic Biodiversity and Species Impact Assessment
Albert Froneman (*Pr.Sci.Nat.)*	AfriAvian Environmental	Avifauna Impact Assessment
Lourens Du Plessis *(GPr GISc)* Tosca de Villiers *(SACLAP and EAPASA Registered)*	LOGIS NuLeaf Planning and Environmental (Pty) Ltd	Visual Impact Assessment
John Gribble (*ASAPA Registered*)	TerraMare Archaeology	Heritage Impact Assessment (Archaeology and Cultural Landscape)
Elize Butler	BANZAI Environmental	Palaeontology Impact Assessment
Sue Reuther Duncan Keal	SLR Consulting	Socio-Economic Impact Assessment
Athol Schwarz (*Pr. Tech.*)	Private	Traffic Impact Assessment
Debbie Mitchell *(Pr Eng)*	Ishecon cc	Battery Storage High Level Safety, Health and Environment Risk Assessment
Louis Jonk (*Pr.Sci.Nat.)*	GEOSS South Africa	Desktop Geotechnical Assessment
Stephen Burton (*Pr.Sci.Nat.)* Dr Owen Davies (*Pr.Sci.Nat.)*	ERM Consulting	Bat Species Impact Assessment
Dr Brett Williams Jason Hutten	Safetech	Noise Impact Assessment
Helen Antonopoulos (*Cand.Sci.Nat.)* Lizande Kellerman[2] *(Pr.Sci.Nat.)*	CSIR	Civil Aviation Site Sensitivity Verification
Helen Antonopoulos (*Cand.Sci.Nat.)* Lizande Kellerman[2] *(Pr.Sci.Nat.)*	CSIR	Defence Site Sensitivity Verification

The specialist assessments comply with Appendix 6 of the 2014 NEMA EIA Regulations (as amended), or the Assessment Protocols published in GN 320 on March 2020; or the Assessment Protocols published in GN 1150 on October 2020 (as amended in GN 3717; July 2023). However, the Battery Energy Storage System (BESS) High Level Safety, Health and Environment (SHE) Risk Assessment serves as a technical report, and the aforementioned legislation is thus not applicable.

7. STUDY AREA

The study area or preferred site for the proposed WEF and associated infrastructure covers approximately 5 356 hectares (ha), which includes the full extent of the affected farm properties, and the Electricity Grid Infrastructure (EGI) corridor. These farm properties are listed in Table D.

[1] Based on resource availability, a new Terrestrial Biodiversity and Species specialist was appointed in May 2025 for the Eland WEF and Windy Plains WEF.
[2] This staff member resigned from the CSIR at the end of July 2025.

Table D. Farm portions and SG codes for the Study Area

FARM PORTION	21-DIGIT SURVEYOR GENERAL CODE	AREA (ha)
WEF, SUBSTATION COMPLEX, AND INTERNAL ROADS		
Elands Fontein Farm RE/24	C00900000000002400000	2 229
EGI CORRIDOR		
Elands Fontein Farm RE/24	C00900000000002400000	166
Drooge Onrust Farm RE/22	C00900000000002200000	

As part of the Scoping and EIA Process, the full extent of the study area was assessed by the specialists in order to identify environmental sensitivities and no-go areas. The preferred site serves as the study area for this Scoping and EIA Process. Therefore, the terms “site” and “study area” are used synonymously in the EIA Report.

8. PROJECT DESCRIPTION

A summary of the key components of the proposed project and technical information is described in Table E below.

Table E. Summary of the components and associated infrastructure of the Eland WEF[3]

COMPONENT	DESCRIPTION
Wind Turbines	
Type of Technology	▪ Onshore Wind Turbine Generators (WTGs)
Turbine Count	▪ Up to 27 WTGs
Capacity per WTG	▪ Up to 10 MW
Facility Generation Capacity	▪ Up to 270 MW
Hub height	▪ Up to 200 m
Tower	▪ Conical shaped either constructed of full steel, full concrete, or hybrid
Number of Blades per WTG	▪ 3
Length of blade	▪ Up to 100 m
Rotor (Blade) diameter	▪ 200 m (up to 100 m blade / radius)
Rotor Top Tip Height	▪ Up to 300 m (maximum based on 200 m hub + 100 m blade length)
Foundation Diameter per WTG	▪ Up to 64 m
Foundation Area per WTG	▪ 0.32 ha
Hardstand / Laydown per WTG	▪ Up to 2.22 ha ▪ The length and width of the hardstand / laydown area changes per WTG depending on the soil and topographic properties, e.g., 206 m x 108 m or 190 m x 117 m etc.
Disturbed Area per WTG (Foundation + Hardstand)	▪ Up to 2.54 ha

[3] The proposed project specifications were amended from the Scoping Phase to the EIA Phase. The main updates to the project specifications include:
- Turbine Count changed from 21 WTGs in the Scoping Phase to up to 27 WTGs in the EIA Phase.
- Facility Generation Capacity changed from 210 MW in the Scoping Phase to up to 270 MW in the EIA Phase.

COMPONENT	DESCRIPTION
Overhead Transmission Power Line (OHPL)	
Line capacity	▪ 132 kV
Line length	▪ Approximately 5 km
Pylon height	▪ 17.4 m – 31 m
Pylon type, span, working area and footprint	▪ Type: Monopole or steel lattice type pylons, or combination of both where required. ▪ Span: The pylons will have a span of 200 m to 350 m for monopole pylons and up to approximately 500 m for lattice structures. ▪ Working area: The working area required around a pylon position during the construction phase is approximately 30 m x 30 m (900 m^2). ▪ Footprint: The size of the final constructed pylon footprint depends on the type of structure used, which will typically range from approximately 0.5 m^2 to 8 m^2 for monopole pylons, and 36 m^2 to 173 m^2 for steel lattice pylons.
Tower type	▪ Self-supporting and Angle Strain towers
Registered servitude	▪ Up to 55 m wide (where multiple adjacent power lines occur), in line with the Eskom Distribution Guideline for OHPL. Note that the entire servitude will not be cleared of vegetation.
Assessment corridor	▪ Specialists assessed an approximately 300 m wide corridor (i.e., 150 m on either side of centreline) for the power line to identify sensitivities and features that need to be avoided.
Building Infrastructure and Substation	

Substation Complex	▪ Cumulative Footprint: ~13 ha in extent and includes:
	  ▪ 33/132kV on-site Substation (~1 ha)
	  ▪ BESS (~2.7 ha)
	  ▪ O&M Buildings (~0.25 ha)
	  ▪ Laydown area (~4.6 ha)

Auxiliary Buildings	▪ Type: These include, but are not limited to, O&M building / centre, site office, workshop, staff lockers, bathrooms / ablutions, warehouses, guard houses, etc. ▪ Cumulative Footprint: Approximately up to 0.25 ha / 2500 m^2 ▪ Height: Up to 10 m
Inverter / Transformer Stations	Several transformers will be installed with the following specifications: ▪ Height: Approximately 3 m ▪ Footprint: Approximately 220 m^2 each
On-site Substation	▪ Footprint: Approximately 1 ha ▪ Height of the on-site substation complex: Up to 10 m. However, the on-site substation will include switchgear portals up to 15 m and lightning masts up to 25 m in height. ▪ Capacity of the on-site substation: up to 132 kV ▪ Fence: Galvanized palisade fencing to be used at the substations ▪ Fence height: Up to 2.5 m
Associated Infrastructure	
Battery Energy Storage System (BESS)	▪ Preferred Technology: Lithium-Ion or Sodium-Ion (Solid state) ▪ Alternative Technology: Redox Flow ▪ Footprint: Up to 2.7 ha ▪ Height: Up to 10 m ▪ Capacity: Up to 1 200 MWh ▪ Fence: Galvanized palisade fencing

COMPONENT	DESCRIPTION
	▪ Fence height: Up to 2.5 m
On-site medium voltage internal cables	▪ Placement: Underground (above ground (or a combination of both) pending technical constraints) ▪ Capacity: 33 kV ▪ Depth: Maximum depth of underground cables 3 m ▪ Safety: Danger tape will be placed at appropriate intervals above the cable to alert contractors or workers post-construction that buried electrical cable is located in the area they are excavating.
Access roads	▪ Existing roads will be used as far as practically achievable. The proposed project site can be accessed via the following road: o Divisional Road 2315 (DR02315); ▪ Refer to the Traffic Impact Assessment for additional information on the route options per project. ▪ A separate Environmental Assessment Process will be undertaken should any road upgrades trigger listed activities in terms of the 2014 NEMA EIA Regulations (as amended).
Internal roads	▪ Internal roads: The proposed project will have a total internal service road network of up to approximately 35 km. Permanent roads will be up to 6 m wide and may require side drains on one or both sides. All roads may have underground cables running next to them. A 12 m wide road corridor may be temporarily impacted during construction and rehabilitated to 6 m wide after construction. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles, temporary passing lanes, side drains, and/or stormwater control measures. The network layout is designed to provide efficient access to all elements of the facility and effective accommodation of the anticipated internal traffic. ▪ Details: New internal service roads and storm water control measures will need to be established. The internal service roads will comprise of both existing and new roads. Existing unnamed roads will be used as far as possible and will be upgraded, expanded, and compacted. New roads will be constructed in the absence of existing roads. ▪ Width: Approximately 4 – 6 m
Storm water channels	▪ Details to be confirmed once the Engineering, Procurement and Construction (EPC) contractor has been selected and the design is finalised. Where necessary, a detailed storm water management plan would need to be developed.
Work area during the construction phase (i.e. laydown area, site camp and temporary concrete batching plant)	▪ Temporary Laydown: Up to 4.6 ha. ▪ Temporary concrete batching plant: A temporary site camp establishment and concrete batching plant of ± 100 m x 100 m (1 ha).
Fencing	▪ The proposed built infrastructure on site will be secured via the installation of appropriate fencing for reasons such as security, livestock/ wildlife safety, public protection and lawful requirements. Existing livestock or wildlife fencing on the affected farm portions may be erected or upgraded where deemed insufficiently secured, whereas permanent fencing will be required around the O&M area, substation complex, and BESS. Access points will be managed and monitored by an appointed security service provider, if deemed

COMPONENT	DESCRIPTION
	required. The type and height of fencing to be installed will be confirmed during the detailed design phase prior to construction. ▪ Fence height: Up to 3 m for wildlife fencing.
Water Requirements	▪ Approximately 50 000 m^3 of water is estimated to be required per year for the construction phase. ▪ Approximately 3 500 m^3 of water is estimated to be required per year for the operational phase. ▪ Water requirements during the decommissioning phase are unknown at this stage. Potential water sources: Local municipality, third-party water supplier, existing boreholes, newly drilled boreholes on site or a combination of existing and newly drilled boreholes on site. ▪ Potential water supply methods: Trucked to site from an external source, bulk supply pipeline, or on-site borehole piped via a temporary HDPE pipe. ▪ A separate Environmental Assessment Process will be undertaken should the water supply method trigger listed activities in terms of the 2014 NEMA EIA Regulations (as amended). Additionally, GA or WULA will be undertaken post-EA in terms of the 1998 NWA.
Workforce	▪ Exact employment numbers may vary however the following estimates are provided: o Construction Phase: 250 – 350 employment opportunities, including low-skilled, semi-skilled, and skilled. o Operational Phase: 35 – 45 employment opportunities, including low-skilled, semi-skilled, and skilled.
Construction Period	▪ 24 to 30 months
Operational Period	▪ Once the commercial operation date is achieved, the proposed facility will generate electricity for 20 to 25 years.

9. SUMMARY OF IMPACT ASSESSMENT FINDINGS AND RECOMMENDED MANAGEMENT ACTIONS

Based on the detailed specialist assessments, various potential impacts have been identified. A summary of the **main impacts** identified is provided in Table F. Note that several mitigation measures have also been provided by the specialists, however only selected key measures are noted in the table below. In general, some of the mitigation measures of the most significant impacts (post-mitigation) have been included in the table below. The specialist studies included in Appendix G of the EIA Report, and the overall impact assessment in Chapter 6 of the EIA Report, contain all the detailed mitigation measures. The recommended mitigation measures have also been included in the Environmental Management Programmes (EMPrs) in Appendix H of the EIA Report.

Table F. Summary of Key Impacts that were identified and assessed during the EIA Phase as part of the Specialist Assessments, including key recommended mitigation measures

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
Appendix G.1: Agriculture Compliance Statement	**Negative Impacts:** **Construction, Operational and Decommissioning Phases:** • Loss of agricultural production potential due to exclusion of agriculture from land directly occupied by development infrastructure. **Construction and Decommissioning Phases:** • Loss of agricultural production potential due to soil degradation, which includes soil erosion and loss of topsoil. **Positive Impacts:** **Operational Phase:** • Increase in agricultural production potential due to increased financial security for farming operations through rental income generation during the operational phase of the WEF. • Increase in agricultural production potential through an improved road network, with associated storm water handling system. **Negative Cumulative Impacts:** • Operational Phase: Regional loss (including by degradation) of future agricultural production potential.	**Planning Phase:** ▪ Design an effective storm water management control system, which will prevent erosion, at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points, and it must prevent any potential down slope erosion. **Construction Phase:** ▪ Implement an effective storm water management control system (as specified in the design phase). ▪ Any excavations done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 20 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it is at the surface. ▪ Topsoil should only be stripped in areas that are excavated. ▪ Across most of the site, including construction laydown areas, it will be much more effective for rehabilitation to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire cut surface. **Operational Phase:** ▪ Maintain the storm water run-off control system. Monitor erosion and remedy the storm water control system in the event of any erosion occurring. ▪ Facilitate re-vegetation of denuded areas throughout the site. **Decommissioning Phase:** ▪ 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.
Appendix G.2: Terrestrial Biodiversity and Terrestrial Animal Species Assessment,	**Negative Impacts:** **Construction Phase:** • Loss of natural habitat and sensitive features, and fragmentation of non-threatened ecosystem, terrestrial Critical Biodiversity Area (CBA) 2, Ecological Support Area (ESA) 2 and Other Natural Area (ONA) (Western Cape Biodiversity	***Note: The significance of all identified impacts in the Terrestrial Biodiversity and Species Assessment is rated as low significance post-mitigation. Therefore, only some mitigation measures have been highlighted below for each phase.*** **Construction Phase:** ▪ Within High and Very High sensitivity areas including their buffer zones, turbines and other non-linear infrastructure such as the BESS and substation must be excluded. ▪ Micrositing should be considered for non-linear infrastructure located in provincial CBAs.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
and Terrestrial Plant Species	Spatial Plan (WCBSP)), and terrestrial CBA 1 (Northern Cape Biodiversity Spatial Plan (NCBSP)). • Impacts on national and provincial protected plant species (SCC). • Disturbance, loss or displacement impacts on animal SCC, especially for Riverine Rabbits and Karoo Dwarf Tortoise. • Introduction and spread of alien invasive species. • Increased erosion and soil compaction. • Littering and general pollution. **Operational Phase:** • Direct and indirect faunal disturbance and mortality. • Increase in alien invasive species. • Loss of species composition and diversity. • Littering and general pollution. **Decommissioning Phase:** • Loss of habitat. • Direct and indirect disturbance and mortality of fauna. • Disposal of used parts – waste management. • Increased alien invasive species. **<u>Negative Cumulative Impacts:</u>** **Construction and Decommissioning Phases:** • Loss of CBAs, natural vegetation and sensitive features. **Construction, Operational and Decommissioning Phases:** • Loss and/or displacement of plant and animal SCC. • Increased alien invasive species.	▪ For non-linear infrastructure, the Watercourse habitat should be avoided as far as possible as per the sensitivity map compiled for Terrestrial Biodiversity. In addition, refer to the Aquatic Biodiversity Assessment where the watercourse is delineated, mapped and suitable buffers recommended by the Aquatic Biodiversity specialist. ▪ Rehabilitate disturbed areas that are no longer required for the operational phase of the development. ▪ A comprehensive Plant Search and Rescue must be undertaken for the approved layout by a suitably qualified botanical specialist prior to vegetation clearance and disturbance. ▪ Where the approved layout designs impact on provincially protected individuals, permit applications are required for either the relocation or destruction of provincially protected species (Western Cape Biodiversity Act, 2021 (Act 6 of 2021), in terms of section 62 of the Nature Conservation Ordinance (as amended), and the 2009 Northern Cape Nature Conservation Act). ▪ Search and rescue for sensitive animal species before areas of intact vegetation are cleared and ongoing during construction, as required. This should be conducted by relevant experts with experience in search and rescue of the faunal groups concerned. ▪ Speed restrictions (40 km/hour is recommended) should be in place to reduce the amount of dust caused by vehicle movement along the roads, and to reduce possible fauna fatalities with vehicle collisions. ▪ In areas where Riverine Rabbits and Karoo Dwarf Tortoise are likely active, reduce speed limits to 30 km/hour and place appropriate signage next to the road to indicate sensitive areas. ▪ Any overhead cabling with associated pylons within and near (within 1 km) areas of suitable habitat should be designed so as to discourage crows from nesting on the structures and preying on Karoo Dwarf Tortoise. ▪ No additional water sources should be provided: construction of dams or water storage must be prohibited or enclosed in a container without leaks. Artificial surfaces should be constructed in a manner to avoid the pooling of rainwater, with suitable drainage designs. Unused dams should be dismantled. ▪ Fences should be constructed in such a way so that burrowing animals can still gain access. Electrified fences must not have active wires below 20 cm from ground level and a guard wire set at 20 cm can be used to keep larger tortoises away from the fence. ▪ Ground clearing and the digging of trenches should ideally not take place during the dry season (typically June to September), in order to minimise the impacts of dust. Where this is not possible, the appropriate dust suppression measures must be implemented. ▪ Alien vegetation, within the development footprints, should be removed from the site and disposed of at a registered waste disposal site. ▪ Rehabilitate new vehicle tracks and areas where the soil has been compacted as soon as possible after use. ▪ The site camp must not be located in very high and high sensitivity areas and their buffer zones. ▪ Dangerous goods may not be stored within 100 m of a watercourse. ▪ Ablution facilities must be located outside sensitive areas and their buffer zones. **Operational Phase:** ▪ Reduce the presence of human activity on the project area as far as possible by only focusing on the areas where operational tasks are required.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		▪ Persecution of fauna species must be reduced through education and awareness campaigns. No physical harm, collection or hunting to any species may occur. ▪ Minimise use of infrastructure that could be used for nesting and making structures less suitable by selecting specific designs or using perch deterrents. ▪ Corvid (crows and ravens) censuses must be included in the avifauna operational monitoring programme, and if corvid populations show large increases, then additional measures such as nest removal and humane euthanising of corvids must be considered and implemented (this will require an ornithologist and possible permits). ▪ If trends or patterns emerge from the data (e.g., high incidence of tortoise mortality), appoint a suitably qualified specialist to develop and implement corrective actions. ▪ In areas where Riverine Rabbits and Karoo Dwarf Tortoise are likely active, reduce speed limits to 30 km/h and place appropriate signage next to the road to indicate sensitive areas. ▪ Movement barriers installed in the construction phase must be monitored and maintained weekly to ensure that they are accessible, clean and fully functional. This can be adapted to biweekly or monthly, depending on the outcomes of the construction phase data and recommendations made. ▪ Equipment with low noise emissions must be used to not disrupt ecological life cycles (breeding, migration, feeding) of animals. Do not unnecessarily disturb faunal species, especially during the breeding season. ▪ Implement appropriate rehabilitation measures to return all disturbed habitats to sustainable, productive use that was representative of the respective vegetation type prior to the commencement of construction. ▪ The site-specific alien and invasive species (AIS) Management Plan must be implemented for the first year of the operational phase. Thereafter, alien vegetation must continue to be monitored and eradicated annually throughout the life of the project. ▪ All waste must be disposed of properly and not stored or disposed of in open dumps where birds can forage. ▪ Vehicles must be in good working condition, with no oil, water or fuel leaks. ▪ All vehicles must be regularly inspected, and any problems corrected. **Decommissioning Phase:** ▪ The vegetation composition, especially within suitable rocky habitat and surroundings, must be rehabilitated to promote foraging habitat available for the Karoo Dwarf Tortoise. Accordingly, rehabilitation efforts cannot just focus on reseeding grasses but must also include replacement of forb and succulent diversity, appropriately. ▪ All infrastructure associated with the project must be dismantled and removed to reduce suitable nesting and perching habitat for corvids. ▪ Pending outcome of corvid censuses included in the avifauna operational monitoring, additional measures might be required. ▪ Decommissioning works should avoid sensitive breeding/migration periods where possible. ▪ Prepare a Waste Inventory during decommissioning to categorise materials into the various categories. ▪ Dismantled parts must be reused, repurposed or recycled where possible. ▪ Recover copper and aluminium wiring for recycling.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		▪ Where feasible, foundations should be partially removed (at least cut to 1 m below ground) to allow topsoil cover and vegetation re-establishment. ▪ Follow an alien and invasive species control and monitoring plan in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004, as amended) (NEMBA) by implementing appropriate control methods during and after decommissioning.
Appendix G.3: Aquatic Biodiversity and Species	**Negative Direct and Indirect Impacts:** **Construction Phase:** ▪ Direct Impact: Decrease in habitat integrity. ▪ Direct Impact: Decrease in aquatic ecosystem integrity (removal or loss of aquatic vegetation). ▪ Direct Impact: Reduced water quality, including increased sedimentation and risks of contamination of surface water runoff. ▪ Indirect Impact: Decrease in aquatic ecosystem integrity (alien vegetation infestation). ▪ Indirect Impact: Stress on a water resource. ▪ Indirect Impact: Road crossing structures may impede flow in the aquatic features. **Operational Phase:** ▪ Direct Impact: Decrease in aquatic ecosystem integrity (ongoing disturbance). ▪ Indirect Impact: Decrease in aquatic ecosystem integrity (disturbance of cover vegetation and soil). ▪ Indirect Impact: Modified hydraulics in the watercourses as a result of any structures associated with the proposed road crossings through the watercourses. ▪ Indirect Impact: Alien vegetation invasion in aquatic features. ▪ Indirect Impact: Stress on a water resource. **Decommissioning Phase:** ▪ Direct Impact: Increased disturbance of aquatic habitat due to the increased activity on the site. ▪ Indirect Impact: Increased sedimentation and risks of contamination of surface water runoff.	***Note: The significance of all identified impacts in the Aquatic Biodiversity and Species Assessment is rated as very low significance post-mitigation. Therefore, only some mitigation measures have been highlighted below for each phase.*** **Construction Phase:** ▪ Implement recommended development setbacks to minimise any works within and disturbance of aquatic ecosystems (and their buffers). ▪ Water use for construction should be minimised as much as possible. The water should be obtained from a lawful and existing water allocation or other viable water sources for construction purposes. ▪ The road crossing structures should be properly designed to not impede flow in watercourses, cause blockages or erosion - low water crossing is preferred. Use existing crossings, as best as possible and where allowable. ▪ Avoid disturbing aquatic habitats as far as possible. Rehabilitate disturbed aquatic habitats once construction works are complete and revegetate them with suitable local indigenous vegetation if required. ▪ Construction materials brought onto the site should be certified as free of alien plant seed. Sources of alien seed should be prevented from being brought onto the site with imported materials. ▪ Undertake monitoring for the growth of alien vegetation during the construction and post-construction phase. ▪ Any works within aquatic features should be undertaken in the dry season where possible. ▪ Sediment traps should be installed and maintained where necessary. ▪ Construction sites and laydown areas should be located within the assessed buildable areas, and should be placed at least 35 m away from the delineated aquatic features. ▪ Good housekeeping and site management measures must be implemented at the laydown areas and the construction site as per the project EMPr and monitored by the appointed Environmental Control Officer (ECO). **Operational Phase:** ▪ The areas of high aquatic sensitivity should be treated as no-go areas for the WEF footprint and hardened areas, whereas and the areas of medium sensitivity should be avoided but can be developed with mitigation (i.e. limit the placement of infrastructure in areas of medium aquatic sensitivity as far as possible). ▪ 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. ▪ Access project infrastructure using existing roads and access tracks established during the construction phase. ▪ Implement and adhere to a Stormwater Management Plan for the proposed development that addresses the stormwater runoff from the developed areas.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	Negative Cumulative Impacts: **Construction and Decommissioning Phases:** ▪ Increased disturbance of aquatic habitat due to the increased activity in the wider area. **Operational Phases:** ▪ Degradation of ecological condition of aquatic ecosystems.	▪ Any new structures within the watercourses associated with the proposed project must not impede flow, or fragment the aquatic habitats, in the watercourses. ▪ A sustainable water supply should be used. **Decommissioning Phase:** ▪ Minimise works within aquatic ecosystems. ▪ Laydown areas should be placed within approved WEF footprint and layout. ▪ Rehabilitate and revegetate disturbed areas, where required. ▪ Mitigation and follow-up monitoring of alien vegetation growth and erosion may be required. ▪ The road network should be returned to that resembling pre-construction, with all additional roads removed where possible.
Appendix G.4: Avifauna Impact Assessment	**Negative Impacts:** **Construction Phase:** ▪ Displacement of avifauna from the area due to disturbance as a result of noise and movement associated with the construction activities. ▪ Total or partial displacement of avifauna due to habitat loss/transformation associated with the construction and presence of the wind turbines, associated infrastructure, and 132 kV power line. **Operational Phase:** ▪ Bird mortality due to collisions with the wind turbines. ▪ Bird mortality due to electrocutions of priority species in the on-site substation complex and on the overhead sections of the internal 33 kV cables. ▪ Bird mortality of power line sensitive species due to collisions with the 33 kV overhead lines (if any) and the 132 kV overhead power line. **Decommissioning Phase:** ▪ Displacement of avifauna from the area due to disturbance (noise and movement) associated with the decommissioning activities.	**Construction Phase:** ▪ Vehicle and pedestrian access to the site should be controlled and restricted to the construction footprint to prevent unnecessary destruction of vegetation. ▪ Vegetation clearance must be limited to what is absolutely necessary and in adherence to rehabilitation measures. ▪ The mitigation measures put forward by the Aquatic, and Terrestrial Biodiversity Specialists must be strictly implemented, especially as far as limitation of the activity footprint is concerned. **Operational Phase:** ▪ No turbines are to be located in the buffer zones as indicated in the sensitivity map included in the Avifauna Impact Assessment. ▪ All wind turbines must have one or two blades patterned according to a South African Civil Aviation Authority (SACAA) approved pattern and the latest guidance on blade patterning as published by BirdLife South Africa (BLSA) to reduce the risk of avian collisions. The current guideline is included in Appendix I of the Avifauna Impact Assessment (which is included in Appendix G.4 of the EIA Report). ▪ The results of the pre-construction monitoring must guide the layout of the turbines, especially as far as proposed no-turbine zones are concerned. No turbines must be located in the buffer zones which were identified based on the results of the pre-construction monitoring, with a specific view to limit the risk of collisions to a variety of birds, including several Red Data species. Note that the current layout has taken these buffer zones into consideration. ▪ It is recommended that the minimum tip height of the turbine blades should be at least 25 m, preferably higher, as low flying birds are at greater risk of turbine collisions if the lower tip height is too low. The disturbance factor would be greater too, especially for ground nesting birds. ▪ Formal live-bird monitoring and carcass searches should be implemented in the operational phase, as per the most recent edition of the Best Practice Guidelines at the time (Jenkins et al. 2015) to assess collision rates. ▪ A Biodiversity Management Plan (BMP) must be compiled for the site prior to commercial operation, and potential biological removal (PBR) values for all priority avifaunal species on-site must be determined. The BMP must define acceptable mortality thresholds for species of conservation concern, using the best information on population estimates, trends, Red Data status and guidelines available at the time. If fatality numbers exceed annual thresholds, additional mitigation measures must be implemented as part of the adaptive management strategy. The choice of additional mitigation

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	Negative Cumulative Impacts: **Construction Phase:** ▪ Total or partial displacement of avifauna due to habitat loss/transformation associated with the construction and presence of the Renewable Energy Projects and their associated Grid Connections. **Construction and Decommissioning Phases:** ▪ Displacement of avifauna from the area due to disturbance as a result of noise and movement associated with the construction and decommissioning activities of the Renewable Energy Projects and their associated Grid Connections. **Operational Phase:** ▪ Mortality of avifauna due to collisions with the wind turbines. ▪ Mortality of avifauna due to electrocutions on the overhead sections of the internal medium voltage networks and in the substation yards. ▪ Mortality of avifauna due to collisions with the medium voltage overhead lines and/or high voltage overhead power lines (grid connections).	measures will be dependent on the measures in place at the time and could involve the implementation of Shutdown on Demand (SDoD) measures or selective curtailment of specific turbines during high-risk periods. ▪ Phosphorescent-type Bird Flight Diverters (BFDs) must be fitted in a staggered configuration (on the earth wire and conductor) to all overhead lines for the full length according to the applicable Eskom Engineering Instruction (5 m apart for medium voltage power lines and 15 m apart for high voltage power lines). These devices must be installed as soon as the conductors are strung. ▪ Conduct quarterly inspections of all overhead sections of the medium voltage power lines as well as the 132 kV overhead power line to look for bird carcasses and to ensure that BFDs are still intact and functioning correctly. ▪ Any bird fatalities should be recorded as part of the post-construction avifaunal monitoring reports. **Decommissioning Phase:** ▪ 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.
Appendix G.5: Visual Impact Assessment	**Negative Direct Impacts:** **Construction Phase:** ▪ Visual impact of construction activities on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF. ▪ Visual impact of construction activities on observers travelling along roads within 5 km of the proposed WEF. **Operational Phase:** ▪ Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF. ▪ Visual impact on observers travelling along the roads within 5 km of the proposed WEF.	**Planning Phase:** ▪ Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. ▪ Existing roads should be utilised wherever possible. New roads should be planned to take due cognisance of the topography to limit cut and fill requirements. Construction/upgrade of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. ▪ In terms of onsite ancillary buildings and structures, it is recommended that it be planned so that the clearing of vegetation is minimised. This implies consolidating this infrastructure as much as possible and making use of already disturbed areas rather than undisturbed sites wherever possible. ▪ It is recommended that no turbines should be placed within 1 km of any homesteads, unless otherwise agreed upon by the affected landowner, even if the landowner is located within the development site. Proof of such agreement is required. Note that such agreement has been obtained from the affected landowner and included as an appendix to the Visual Impact Assessment. ▪ Ensure the application of blade painting is undertaken during the manufacturing process and not as an after application during the construction phase.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	▪ Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5-10 km of the proposed WEF. ▪ Visual impact on observers travelling along roads within 5-10 km of the proposed WEF. ▪ Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 10-20 km of the proposed WEF. ▪ Visual impact on observers travelling along roads within 10 – 20 km of the proposed WEF. ▪ Visual impact on residents of homesteads and visitors to tourist accommodation (if present) located beyond the 20 km radius of the proposed WEF. ▪ Visual impact on visitors to the formally protected Karoo National Park located beyond 20 km of the proposed WEF. ▪ Visual impact of shadow flicker on sensitive visual receptors in close proximity to the proposed WEF. ▪ Visual impact of lighting at night on residents and visitors to homesteads and tourist accommodation within 10 km of the proposed WEF. ▪ Visual impact of lighting at night on observers travelling along roads within 10 km of the proposed WEF. ▪ Visual impact of the ancillary infrastructure on observers in close proximity to the structures. ▪ Visual impact of blade painting on the overall perception of the WEF by sensitive receptors especially within 0-5 km and potentially up to 10 km radius of the wind turbine structures. **Decommissioning Phase:** ▪ Visual impact of decommissioning activities on sensitive visual receptors within 5 km of the proposed WEF. **<u>Negative Indirect Impacts:</u>** **Operational Phase:** ▪ The potential impact on the sense of place of the region.	**Construction Phase:** ▪ Ensure that vegetation is not unnecessarily cleared or removed during the construction period. ▪ Reduce the construction period through careful logistical planning and productive implementation of resources. ▪ Ensure that the placement of laydown areas and any potential temporary construction camps are within the areas planned in order to minimise vegetation clearing (i.e. in already disturbed areas). ▪ Ensure that rubble, litter, and disused construction materials are appropriately stored and then disposed of regularly at licensed waste facilities. ▪ Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent). ▪ Restrict construction activities to daylight hours whenever possible in order to reduce the visual impacts associated with lighting. ▪ Rehabilitate all disturbed areas immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications. **Operational Phase:** ▪ Ensure that the maintenance of the turbines and ancillary structures and infrastructure must be undertaken to ensure that the facility does not degrade, therefore aggravating the visual impact. ▪ Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as and when required. ▪ Monitor rehabilitated areas for rehabilitation failure or concerns and implement remedial action as and when required. ▪ Implement post-construction monitoring to evaluate both avifaunal effectiveness and public perception of painted blades. It is suggested that this is implemented via two complementary monitoring programmes: (a) avifaunal collision monitoring to quantify mortality reduction (as specified by the avifaunal specialist), and (b) visual perception monitoring (stakeholder surveys/photo points) to assess community responses and any unforeseen visual intrusion. Use agreed metrics (e.g., raptor fatalities, local resident perception scores). **Planning and Operational Phase:** ▪ Implement needs-based night lighting if available and considered acceptable by the South African Civil Aviation Authority (SACAA). ▪ Limit aircraft warning lights to the turbines on the perimeter according to SACAA requirements, thereby reducing the overall impact. ▪ Shield the sources of light by physical barriers (walls, vegetation, or the structure itself). ▪ Limit mounting heights of lighting fixtures or alternatively use footlights or bollard level lights. ▪ Make use of minimum lumen or wattage in fixtures. ▪ Make use of down-lighters or shielded fixtures. ▪ Make use of Low-Pressure Sodium lighting or other types of low impact lighting. ▪ Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	Negative Cumulative Impacts: **Operational Phase:** ▪ The potential cumulative visual impact of wind farms, solar farms and EGI on the visual quality of the landscape.	**Decommissioning Phase:** ▪ Remove infrastructure not required for the post-decommissioning use. ▪ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.
Appendix G.6: Heritage Impact Assessment (Archaeology and Cultural Landscape)	***Note: The Heritage Impact Assessment is an integrated report that addresses Archaeology, Palaeontology, Cultural Landscape and Visual. The Palaeontology and Visual Impacts in the integrated Heritage Impact Assessment are based on the dedicated Palaeontology and Visual Impact Assessments undertaken for the proposed project, described separately in this table. These have not been repeated in this section.*** **Negative Direct Impacts:** **Construction Phase:** ▪ Loss of archaeological sites and material. ▪ Damage to or loss of packed stone structures and kraals. ▪ Impacts to the cultural landscape. **Operational Phase:** ▪ Impacts to the cultural landscape. **Decommissioning Phase:** ▪ Loss of archaeological sites and material. ▪ Impacts to the cultural landscape. *Note: It is important to note that even though the impacts on archaeological sites and material during construction are rated as negative, the avoidance of significant identified sites and, where this is not possible, the recording and/or recovery, and curation of such material in a suitable institution would represent positive outcomes and would enhance the regional archaeological database and contribute to the broader scientific understanding of South Africa's heritage.*	**Construction Phase:** ▪ A pre-construction archaeological walkover survey of the final WEF layout must be undertaken. ▪ Finds of archaeological material need to be reported to Heritage Western Cape (HWC) (and the South African Heritage Resources Agency (SAHRA) where applicable) and the project archaeologist. ▪ Historic walls to be demolished are to be photographically recorded before demolition. ▪ No-go areas must be implemented around certain stone features. These are listed below: o 30 m buffer around JG019 (large stone-walled enclosure). o 30 m buffer around JG001-JG003 (stockpost). o 50 m buffer around JG016-JG018 (corbelled huts). o 10 m buffer around GEB003 (stone cairn). o 10 m buffer around JG010 (stone cairn). **Operational Phase:** ▪ Implementation of recommendations of the Visual Impact Assessment to reduce impacts to the cultural landscape. **Decommissioning Phase:** ▪ Finds of archaeological material are reported to HWC (and SAHRA where applicable) and the project archaeologist. ▪ Implementation of recommendations of the Visual Impact Assessment to reduce impacts to the cultural landscape.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	Negative Cumulative Impacts: **Construction and Operational Phases:** ▪ Impacts to the archaeology and cultural heritage resources.	
Appendix G.7: Palaeontology Impact Assessment	**Negative Direct and Cumulative Impacts:** **Construction Phase:** ▪ Loss of fossil heritage. *Note: Any residual negative impacts from fossil loss would be partially offset by a positive outcome, as any newly discovered, well-recorded, and suitably curated fossil material recovered during construction would enhance the regional palaeontological database and contribute to the broader scientific understanding of South Africa's fossil heritage.*	**Construction Phase:** ▪ Implement the Chance Fossil Finds Protocol that has been incorporated into the project EMPrs (Appendix H of the EIA Report). ▪ Implement training of accountable supervisory personnel by a qualified palaeontologist.
Appendix G.8: Socio-Economic Impact Assessment	**Negative Impacts** **Construction Phase:** ▪ Indirect Impact: Social disruption and change in social dynamics. ▪ Indirect Impact: Reduced quality of life and increased risks due to construction near residences. **Decommissioning Phase:** ▪ Direct Impact: Reduced employment and funding. **Direct Positive Impacts** **Construction Phase:** ▪ Direct Impact: Capital investment (CapEx) contributing to the national, regional and local economy. ▪ Direct Impact: Generation of employment, income and skills. **Operational Phase:** ▪ Direct Impact: Operational investment (OpEx) contributing to the national, regional and local economy. ▪ Direct Impact: Generation of employment, income and skills.	***Note: Several mitigation and enhancement measures have been identified in the assessment. The list below is only a summary of some of the recommendations.*** **Positive Impacts – Enhancement Measures:** **Construction Phase:** ▪ Source as many goods and services as far as possible from the local and regional economy (e.g. use local contractors and accommodation and equipment suppliers as far as possible and purchase perishable goods locally). ▪ Consult with existing Independent Power Producer (IPP) projects that successfully procure from local Small, Micro and Medium Enterprises (SMMEs) to share learnings, where possible. ▪ Develop, communicate and implement a fair and transparent labour and recruitment policy. ▪ Ensure diversity and gender equality in recruitment, as far as possible. ▪ Provide training to staff and service providers before and/or during the construction phase; including training on how to position themselves for other employment opportunities once construction ends. **Operational Phase:** ▪ Develop and implement a fair and transparent procurement policy. ▪ Maximise use of local skills and resources through preferential employment of locals where practicable. ▪ Regularly engage with community stakeholders to develop meaningful strategies for community development. ▪ Define vision for economic development in consultation with communities. ▪ Develop a Governance Plan with clear governance rules for the Community Trust, including administration and trustee and beneficiary selection.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	▪ Direct Impact: Increased community prosperity through contributions and income from the WEF. **<u>Cumulative Positive Impacts</u>** ▪ Stimulation of economic and employment growth. ▪ Increased community prosperity through contributions and income from IPPs.	▪ Ensure that funding requirements for each project are considered in the future so that projects are viable and sustainable. ▪ Set clear goals for each project and phase out funding once these goals are achieved. ▪ Ensure regular external auditing of the Community Trust as well as supported projects. ▪ Consider auditing projects for several years after funding has ceased to ensure their benefits are sustained. **Negative Impacts – Mitigation Measures:** **Construction Phase:** ▪ Clearly publicise and implement a recruitment policy. ▪ Work together with impartial local representatives to identify local people during the recruitment process. ▪ Provide transport to site and other incentives to reduce the number of workers accommodated in Engineering, Procurement and Construction (EPC) accommodation to an absolute minimum. ▪ Consult with the municipalities regarding the capacity of existing services and infrastructure (e.g. provision of water, electricity, waste removal, sanitation and housing) to cope with additional workers brought into the area during the construction period. ▪ Consider supporting projects that improve local services and infrastructure and/or deal with social problems or conflicts through the social upliftment programme, if the need arises. ▪ Liaise with nearby residents before and during construction to inform them of construction status and discuss safety management measures to reduce security risks. ▪ Maintain a visible security presence on site. ▪ Implement a grievance mechanism during the construction phase. ▪ Communicate and implement a compensation procedure in the event of damages directly linked to the construction. ▪ Control site access. ▪ Provide transportation to site for unskilled workers. ▪ Declare areas outside of the construction site (that are on private land associated with the project) as no-go areas for construction staff. ▪ Erect and regularly inspect a boundary fence. ▪ Regularly inspect the project area and surrounding area for signs of illegal activity. ▪ Regularly clean any litter from the project area and surrounding area. **Decommissioning Phase:** ▪ Clearly communicate project duration to staff and communities. ▪ Prolong the operational life of the project as much as possible. ▪ Assist with the sustainable administration of funds throughout the project lifetime. ▪ Assist with recommendations and referrals where possible.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
Appendix G.9: Traffic Impact Assessment	**<u>Direct Negative Impacts</u>** **Construction Phase:** ▪ Increased road incidents. ▪ Road degradation. ▪ Dust. ▪ Exhaust emissions. ▪ Hydrocarbon spills. **Operational Phase:** ▪ Increased road incidents. **<u>Cumulative Negative Impacts</u>** **Construction and Operational Phases:** ▪ Construction Phase: Simultaneous construction of all renewable facilities in the Northern, Middle, Southern Clusters and associated Grid Connections (subject to an EA) as proposed by GEED, together with the operational phase of the three proposed Nuweveld Wind Farms. ▪ Operational Phase: Simultaneous operation of all renewable facilities in the Northern, Middle, Southern Clusters and associated Grid Connections (subject to an EA) as proposed by GEED, together with the operational phase of the three proposed Nuweveld Wind Farms.	**Construction Phase:** ▪ Post relevant road signage along affected routes. ▪ Create a local WhatsApp Group, notifying local road users of expected deliveries and associated routes; and for the local community and post notices of road conditions and proposed alternatives. ▪ Schedule deliveries to avoid local congestion. ▪ Identify alternative routes where possible. ▪ Request the assistance of local law enforcement, as required. ▪ A Traffic Management Plan (TMP) is to be compiled once the contractor has been appointed and all the relevant details of the construction process are known. A TMP framework has been compiled for the proposed Northern Cluster (i.e. Eland WEF and Windy Plains WEF) and has been included as an Appendix to the Traffic Impact Assessment. The contractor appointed to construct the proposed development is to use the cluster TMP as a guideline and platform for the compilation of a project specific TMP, once appointed. The TMP must consider all aspects and potential risks relating to the traffic to and on site, including motorised, non-motorised and pedestrians. ▪ Regular maintenance of the public road network must be undertaken. Specifically, contribute to the maintenance of the public roads in the area that are used by and impacted on by the proposed development/s during the construction phase of the development/s, provided this is agreed to by the relevant road authorities. The maintenance should be conducted over weekends to minimise the impact on the average construction period. Such maintenance must be undertaken with approval from the relevant local authorities. ▪ A photographic record of the road condition should be maintained throughout the various phases of the development/s. This provides an objective assessment and mitigates any subjective view from road users. ▪ Maintain continuous engagement with the Northern Cape Department of Roads and Public Works (NCDRPW) and Western Cape Department of Transport and Public Works (WCDTPW). ▪ Upgrade unpaved roads that are used by and impacted on by the proposed development/s to a suitable condition for proposed construction vehicles, provided this is agreed to by the relevant road authorities. ▪ Ensure that the roads that are used by and impacted on by the proposed development/s are left in the same or better condition, post-construction, based on approval and agreement by the relevant road authorities. ▪ Contractor to implement dust suppression in the immediate vicinity of the site where feasible. ▪ Contractor shall take into account dust impacts when activities on site are scheduled and executed. ▪ Contractor to have an emergency plan in place and spill kit available. **Operational Phase:** ▪ Reduce the number of vehicles on the roads when transporting staff during peak periods. ▪ Ensure that driver awareness and road safety training is provided. ▪ Ensure all vehicles are roadworthy, visible, adequately marked, and operated by an appropriately licenced operator. ▪ Drivers to adhere to the speed limit on the public road. ▪ Post the speed limits along the relevant roads as approved by the road authority. ▪ Drivers not complying with speed limits shall be subject to penalties.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
Appendix G.10: Battery Energy Storage System (BESS) High Level Safety, Health and Environment (SHE) Risk Assessment	Various risks were identified in terms of safety, health and the environment due to the proposed BESS. The BESS High Level SHE Risk Assessment identified risks, hazards, and consequences, such as, but not limited to: ▪ Human Health - chronic exposure to toxic chemical or biological agents. Causes - Construction materials such as cement, paints, solvents, welding fumes, truck fumes etc. Consequences - Employee / contractor illness. ▪ Human Health - exposure to noise. Causes - Drilling, piling, generators, air compressors. Consequences - Adverse impact on hearing of workers. Possible nuisance factor in nearby areas. ▪ Human and Equipment Safety - exposure to fire radiation. Causes – Involvement in an external fire. Fire involving fuels used in construction vehicles or vehicles themselves (e.g., tyre fire). Fire due to uncontrolled welding or other hot-work Consequences - Injuries due to radiation especially amongst first responders and bystanders. Fatalities unlikely from the heat radiation as not highly flammable nor massive fire. ▪ Human and Equipment Safety - exposure to fire radiation. Causes - Solid state battery containers damaged on route. Involvement in an external fire. Consequences – Injuries due to radiation especially amongst first responders and bystanders. Fatalities unlikely from the heat radiation as not highly flammable nor massive fire. ▪ Human and Equipment Safety - exposure to explosion over pressures. Causes - With solid state lithium containers, flammable gases generated by thermal run away reach explosive limits. Ignition on hot surfaces, static. Consequences - Potential fatalities amongst first responders. Damage to containers, transport trucks or other nearby items.	▪ There are numerous different BESS technologies but using one consistent technology system for the BESS installations associated with all the Genesis Beaufort West Renewable Energy Cluster Project developments would allow for ease of training, maintenance, emergency response and could significantly reduce risks. ▪ Where reasonably practicable, “state-of-the-art” battery technology should be used with all the necessary protective features, e.g., draining of cells during shutdown and standby-mode, full Battery Management System (BMS) with deviation monitoring and trips, leak detection systems. ▪ Ensure that the technical and system suggestions for managing and reducing risks, as specified in the Risk Assessment, specifically in terms of preventative and mitigative measures are included in the design. ▪ The overall design should be subject to a full Hazard and Operability Study (HAZOP) prior to finalization of the design. ▪ For the Vanadium Redox Flow BESS (VRFB) systems an end of life (and for possible periodic purging requirements) solution for the large quantities of hazardous electrolyte should be investigated, e.g., can it be returned to the supplier for re-conditioning. ▪ Prior to importing any solid-state battery containers into the country, the contractor should ensure that: o An Emergency Response Plan is in place that would be applicable for the full route from the ship to the site. This plan would include details of the most appropriate emergency response to fires both while the units are in transit and once they are installed and operating. o An End-of-Life plan is in place for the handling, repurposing or disposal of dysfunctional, severely damaged batteries, modules and containers. ▪ The site layout and spacing between Solid State BESS (SSB) containers should be such that it mitigates the risk of a fire or explosion event spreading from one container to another. ▪ In order to limit the possibility of domino failures from the BESS onto transformers and to limit direct impacts of any fire or explosion on the substation, the BESS should be separated from the substation by at least 20 m, or greater if specified in local or International Standards. ▪ In order to limit on-site risks, any office and maintenance buildings should be located at least 20 m, although preferably 50 m, from the BESS. ▪ A suitable separation distance (i.e. 500 m) between the BESS and occupied farmhouses / developments / public facilities / residences etc. needs to be implemented. Future developments in the area should take cognisance of the advised 500 m separation distance. ▪ From a high-level SHE Risk Assessment perspective, where there is a choice of alternative locations for the BESS, those that are further from water courses would be preferred. VRFB hazards are mostly related to possible loss of containment of electrolyte and solid-state systems may experience fires that may result in loss of containment of liquids or the use of large amounts of fire water which could be contaminated. The run-off should not enter watercourses directly. Ideally, the BESS should be placed at least 50 m away from known boreholes and water points, and outside of the sensitive areas identified by the Aquatic Biodiversity specialist. ▪ Once the technology has been chosen and more details of the actual design are available, all risk assessments required under the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHS Act) should be in place (prior to commencement, after EA and other necessary approvals are granted (should such be granted)).

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
Appendix G.11: Geotechnical Impact Assessment	**Direct Negative Impacts** **Construction Phase:** ▪ Displacement of geologic material. Removal of rocks and other geologic materials for site levelling and grading, resulting in loss of geologic materials. ▪ Contamination of geologic materials as a consequence of the construction activities by earthworks machinery and other apparatus. **Operational Phase:** ▪ Increased unnatural hard surfaces yielding increased runoff, potentially increasing erosion. ▪ Contamination of geologic materials as a consequence of typical maintenance activities, or spillages associated with the BESS. **Decommissioning Phase:** ▪ Increased unnatural hard surfaces yielding increased runoff, potentially increasing erosion. ▪ Contamination and disturbance of geologic materials as a consequence of typical decommissioning activities. **Cumulative Negative Impacts** The same impacts described above were identified in the cumulative impact assessment for the construction, operational and decommissioning phases.	***Note: The significance of all identified direct impacts in the Geotechnical Impact Assessment is rated as very low significance post-mitigation. Therefore, only some mitigation measures have been highlighted below for each phase.*** **Construction Phase:** ▪ Favour dolerite as an aggregate (as opposed to Karoo sandstones and mudstones). This is subject to investigation. ▪ Any road cuttings should be designed by an appropriately qualified professional. ▪ Drainage on site should be designed and managed appropriately. ▪ Investigate and confirm the geotechnical suitability of each structure (or other appropriate level of investigation) prior to construction (i.e. determine that soil with an adequate bearing capacity is obtained beneath each footing). Such investigations would not be required to fulfil the requirements of this EIA process. However, it would be necessary prior to construction. ▪ Only strip vegetation necessary for the next phase of construction. ▪ Install temporary drainage to divert stormwater away from active construction activities, where required. ▪ Effective stormwater management must include effective stabilisation (e.g. gabions and Reno mattresses) of exposed soil. ▪ Where impacted through construction-related activities, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled. ▪ During the execution of the works, appropriate measures to prevent pollution and contamination of the environment must be implemented, e.g. ensuring that construction equipment is well maintained. ▪ Provision must be made for refuelling at the storage area / site camp, and workshop by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained. ▪ A spill kit should be maintained on site. If spillages occur, they should be contained and removed as rapidly as possible, with correct disposal procedures of the spilled material, as reported. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes. **Operational Phase:** ▪ Install drainage to divert stormwater away from activities, roads/tracks, and structures, where required. ▪ Implement the Stormwater Management Plan. ▪ Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used. ▪ Ensure that the BESS is assembled in line with relevant product specifications and with the necessary measures to prevent potential contamination of the surrounding environment. ▪ For the BESS, it is recommended that any wastewater produced by fire hydrants should not be allowed to runoff into the environment, and any waste products produced from the BESS should be removed and disposed of appropriately. **Decommissioning Phase:** ▪ Only drive and park vehicles where necessary.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		▪ Land rehabilitation to near natural state, i.e. removal of foundations and backfilling of any resultant voids within the soil, as well as removal of hard surfaced areas. Replacement soil should be sourced locally to ensure homogeneity. Reseed with natural vegetation and grasses to further mitigate future displacement. ▪ Reinstate natural topography where cut-to-fill embankments have been constructed. ▪ Implement generic environmental management procedures for infrastructure.
Appendix G.12: Bat Impact Assessment	**<u>Direct Negative Impacts</u>** **Construction Phase:** ▪ Displacement of bats due to habitat loss / habitat transformation. ▪ Roost Disturbance. ▪ Roost Destruction. **Operational Phase:** ▪ Mortality of bats due to turbine collisions while commuting/foraging. ▪ Mortality of bats due to turbine collisions during migrations. ▪ Light pollution associated risks including loss of insect prey and increased collision risks for bats foraging closer to turbines. **Decommissioning Phase:** ▪ Displacement of bats due to disturbance associated with the decommissioning activities. **<u>Cumulative Negative Impacts</u>** **Operational Phase:** ▪ Cumulative Bat Mortality Impacts.	**Construction Phase:** ▪ During construction, laydown areas and temporary access roads should be kept to a minimum in order to limit direct vegetation loss and habitat fragmentation. Construction of the infrastructure should, where possible, be situated in areas that are already disturbed. ▪ Limit the removal of vegetation, particularly large mature trees within 50 m of turbine positions. ▪ Potential roosts, specifically buildings and rocky crevices, must be buffered by 200 m, inside which no turbine infrastructure may be placed. No turbines should be installed within 50 m of large mature trees. *Note that no roosts were identified in the study area during the site survey. Additionally, the current layout adheres to the high sensitivity buffer zones identified by the bat specialist, as no turbines fall within the high sensitivity areas.* ▪ The WEF must be designed and constructed in such a way as to avoid the destruction of potential and actual roosts, particularly large mature trees, buildings, and rocky crevices (if blasting is required). ▪ Large mature trees within 50 m of the turbine positions should be inspected for roosting bats, and appropriate mitigation should be undertaken as recommended by a bat specialist. **Operational Phase:** ▪ Designing the layout of the project to avoid areas that are more frequently used by bats will reduce the likelihood of mortality and should be the primary mitigation measure. These areas include key microhabitats such as water features, large mature trees, buildings, and rocky crevices. These areas have been buffered by 200 m. *Note: No turbines are currently located within the buffers in the layout*. ▪ The height of the lower blade swept area must be maximised, and should try to be kept above 50 m. If the minimum blade sweep is lower than 50 m from ground level, the facility runs the risk of reaching fatality thresholds sooner. *Note that the proposed hub height is up to 200 m, whilst the proposed blade length is approximately 100 m. As such, the proposed WEF's lower blade sweep height from ground level is approximately 100 m.* ▪ Operational monitoring should be done according to the guidelines for the first 2 years and every 5 years thereafter. During this monitoring, fatality estimations would need to be evaluated every 3 – 4 months against the South African Bat Assessment Association (SABAA) fatality threshold guidelines (i.e. if they exceed an estimated 24 bat fatalities per year as per current threshold) to determine escalation of mitigation options. ▪ Blade feathering should be implemented at the start of operation. ▪ Apply curtailment during spring, summer and autumn based on an appropriate curtailment plan and/or install acoustic deterrents (based on input from an appropriate bat specialist) if mortality occurs beyond threshold levels as determined based on applicable guidance (MacEwan et al. 2018). The threshold calculations must be done at a minimum of once a quarter (i.e. not only after the first year of operational monitoring) so that mitigation can be applied as quickly as possible should thresholds be reached.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		Decommissioning Phase: ▪ The impacts to bats during this phase are likely to be restricted to disturbance. Provided decommissioning activities are restricted to daylight hours, the impact to bats is predicted to be negligible.
Appendix G.13: Noise Impact Assessment	**Direct Negative Impacts** **Construction Phase:** ▪ Noise pollution due to construction activities (equipment and vehicle noise). **Operational Phase:** ▪ Daytime: Mechanical and aerodynamic noise from the operation of the wind turbine components. ▪ Nighttime: Mechanical and aerodynamic noise from the operation of the wind turbine components. **Decommissioning Phase:** ▪ Noise pollution due to decommissioning activities (equipment and vehicle noise). **Cumulative Negative Impacts** **Operational Phase:** ▪ Mechanical and aerodynamic noise from the operation of the wind turbine components.	**Construction Phase:** ▪ Staff to receive training on noise sensitivity. ▪ Comply with the Western Cape Noise Control Regulations published in Provincial Notice 200/2013. ▪ Monitor noise during the construction phase to confirm noise levels are within limits. ▪ Limit construction / piling to daytime. ▪ Regularly service equipment to ensure no unnecessary noise is emitted. **Operational Phase:** ▪ Conduct noise monitoring during the operational phase to determine actual noise impact and whether further mitigation measures need to be implemented. This may include operating the turbine in a low noise mode (i.e. reducing power output under certain operational conditions). ▪ Implement a 500 m buffer around all noise sensitive areas to ensure no future WTGs impact these noise sensitive areas. Note that the recommended 500 m no-go buffers have been applied and that no WTG are located within these Noise Sensitive Areas (NSAs). **Decommissioning Phase:** ▪ Staff to receive training on noise sensitivity. ▪ Monitoring of noise during the decommissioning phase to confirm noise levels are within limits. ▪ Limit decommissioning activities to daytime in order to take advantage of unstable weather conditions. ▪ Regularly service equipment to ensure no unnecessary noise is emitted.
Appendix G.16: Wake Effects	**Background:** A Wake Effects Study was undertaken with the overall objective of determining the potential impact of the energy production of the Eland WEF on the proposed surrounding WEFs within a 30 km radius; and the potential impact of the proposed surrounding WEFs on the energy production of the Eland WEF. Wake effects could directly influence energy yields and indirectly influence aspects such as the socio-economic and enterprise development initiatives that could be made available by the WEF projects for the surrounding communities if they were to be commercialised.	**Outcome of the Study:** WindPro™ calculated the theoretical reduction of yield of the Eland WEF caused by surrounding WEFs as shown in Table A below; and the theoretical reduction in yield caused by Eland WEF on surrounding projects as shown in Table B below. The wake loss calculation results in Table B show that while there could be a potential for Eland WEF to impact the other WEF projects through wake loss, this is expected to be by a low value. As shown in Table B, seven of the surrounding projects would experience a wake loss of zero to 0.5%. Conversely, as shown in Table A, the surrounding projects are predicted to have a wake loss effect on the Eland WEF of 3.0 to 3.5% for Hoogland 2, 0.5 to 1.0% for a further three projects, and zero to 0.5% for a further nine projects.

<table>
<tr><th>Specialist Assessment undertaken</th><th>Key Impacts Identified</th><th>Recommended Mitigation Measures</th></tr>
<tr>
<td></td>
<td>There are no operational WEFs within 30 km of the proposed Eland WEF. A total of 20 proposed WEF projects have received EA within 30 km of the Genesis Northern Cluster WEFs. Note that other Wind Energy Facilities proposed by GEED in the Beaufort West Renewable Energy Cluster have been excluded from the wake effects study (as this is an internal yield management issue for GEED and does not influence other IPPs). Refer to Table 1 and Figure 1 of the Wake Effects Study, which is included in Appendix G.16 of the EIA Report.

The wake loss assessment completed in the EIA Phase is subject to multiple high-level assumptions as various factors still need to be confirmed, such as the final turbine layouts and turbine models for the proposed surrounding WEF projects, including the latter for the proposed Eland and Windy Plains WEFs together with pending DFFE approval of the final layout plans.

The theoretical wake impact of the Eland WEF on the surrounding projects and the theoretical wake impact of the surrounding projects on the Eland WEF was undertaken using the industry accepted wind flow modelling software, WindPro™.</td>
<td>Although there is the potential for a small reduction in yield that could affect socio-economic and enterprise development funding per project, the net effect of all projects contributing to the local community is considered significantly more positive and beneficial.

Table A
<table><tr><th>Theoretical reduction in yield caused by wake loss from the following nearby authorised WEF projects ON the Eland WEF:</th><th>Wake Loss %</th></tr><tr><td>• Hoogland 2</td><td>3.0 ≥ 3.5</td></tr><tr><td>• Hoogland 1
• Mulilo Karoo Wind Power 1
• Mulilo Karoo Wind Power 2</td><td>0.5 ≥ 1.0</td></tr><tr><td>• Hoogland 3
• Hoogland 4
• Nuweveld North
• Nuweveld West
• Nuweveld East
• Mulilo Karoo Wind Power 3
• Loxton
• Taaibos North
• Taaibos South</td><td>0 ≥ 0.5</td></tr><tr><td>• Klipkraal 1
• Klipkraal 2
• Klipkraal 3
• Klipkraal 4
• Klipkraal 5
• Soutriver North
• Soutriver Central</td><td>0.0</td></tr></table>
Table B
<table><tr><th>Theoretical reduction in yield caused by wake loss from the Eland WEF ON the following nearby authorised WEF projects:</th><th>Wake Loss %</th></tr><tr><td>• Hoogland 2
• Hoogland 3
• Hoogland 4
• Nuweveld North
• Nuweveld West
• Nuweveld East
• Mulilo Karoo Wind Power 3</td><td>0 ≥ 0.5</td></tr><tr><td>• Hoogland 1
• Mulilo Karoo Wind Power 1
• Mulilo Karoo Wind Power 2
• Klipkraal 1
• Klipkraal 2
• Klipkraal 3
• Klipkraal 4
• Klipkraal 5
• Loxton
• Taaibos North
• Taaibos South
• Soutriver North
• Soutriver Central</td><td>0.0</td></tr></table>
The potential wake loss impacts on all proposed WEFs by Eland WEF and vice versa has been recognised, and the Applicant is committed to addressing wake loss if any or all facilities are commercialised. If the wake impact assessment is updated with final turbine layouts, turbine model, hub heights and other technical considerations, then the wake impact predictions will be significantly more accurate. Only at the point of more certainty around wind farm configurations and commercialisation is it fair, equitable and market standard to conclude a Wake Loss Compensation Agreement based on the outcome of a detailed wake loss assessment. The Wake Loss Impact Results at this stage are high-level and do not represent the actual wake loss impacts in the future sufficiently and fairly enough to be able to reach formal agreements. It is thus not reasonable and fair to conclude a Wake Loss Compensation Agreement at this stage. As the project progresses and is prepared for commercialisation, the Applicant is committed to further engagements with potentially affected WEFs to determine potential issues and impacts of wake loss as may be required.</td>
</tr>
</table>

10. SUMMARY OF THE KEY IMPACT ASSESSMENT FINDINGS

Table G below provides a summary of the impact assessment for the proposed project, post-mitigation for direct and indirect impacts. Table H provides the same information for the cumulative impacts. Some impacts were not identified, or are considered insignificant, or could not be measured empirically at the time of assessment.

Based on the findings of the detailed specialist impact assessments, which are included in Appendix G of the EIA Report, the following is concluded for the proposed project:

- With the implementation of mitigation measures, this project is considered to have an **overall Low to Very Low negative environmental impact, with certain moderate and high negative environmental impacts.** Specifically, **high significance** negative impacts (post-mitigation) have been identified in the Visual Impact Assessment and Traffic Impact Assessment for the construction and operational phases. Note that the relevant specialists have explained that this is not unacceptable or a fatal flaw. In addition, **moderate significance** negative impacts (post-mitigation), were identified in the Visual Impact Assessment and Heritage Impact Assessment for the construction and decommissioning phases, as well as in the Avifauna Impact Assessment and Heritage Impact Assessment for the operational phase. Refer to Table G.

- With the implementation of enhancement measures, this project is considered to have an **overall Low to High positive socio-economic impact**. Refer to Table G.

- The majority of the **cumulative negative impacts** were rated with a **Low and Very Low** post-mitigation impact significance for the construction, operational and decommissioning phases, with the exception of Avifauna impacts being rated as **Moderate** during the operational phase, and Visual impacts being rated as **Very High** also during the operational phase. The Visual Impact Assessment confirmed that the cumulative impact is not considered a fatal flaw as the addition of the proposed Eland WEF is not expected to contribute to the cumulative visual impact significantly. A few specialist studies found insignificant impacts or did not identify cumulative impacts for the various phases. Refer to Table H.

- In terms of **cumulative positive impacts**, the Socio-Economic impacts are considered **highly significant** (with enhancement) for the construction and operational phases, noting that if the timing of construction of different wind energy projects can smooth the employment levels and provide longer-term continuity of employment, this enhances the positive cumulative benefit. Furthermore, the socio-economic specialist notes that the projects considered in the cumulative impact assessment would cumulatively magnify the benefits and some impacts of the Eland WEF, and the risk of distorting effects is present as the area is sparsely populated and there are limited economic opportunities. Refer to Table H.

Table G. Overall Impact Significance with the Implementation of Mitigation Measures for Direct Negative and Positive Impacts

Specialist Study	Construction	Operational	Decommissioning
Direct Negative Impacts			
Agriculture	Low	Low	Low
Terrestrial Biodiversity and Terrestrial Animal and Plant Species	Low	Low	Low
Aquatic Biodiversity and Species	Very Low	Very Low	Very Low
Avifauna Impact Assessment	Low	Moderate / Low	Low
Visual Impact Assessment	Moderate / High	High	Moderate
Heritage Impact Assessment (Archaeology)	Very Low / Moderate	Moderate	Very Low / Moderate
Palaeontological Impact Assessment	Low	No impact	No impact
Socio-Economic Impact Assessment *Note: Construction phase socio-economic negative impacts are rated indirect.*	Very Low / Low	Insignificant and/or not identified and/or not applicable	Low
Traffic Impact Assessment	Low / High	High	TIA to be undertaken at decommissioning
Geotechnical Impact Assessment	Very Low	Very Low	Very Low
Bat Impact Assessment	Very Low	Very Low / Low	Very Low
Noise Impact Assessment	Very Low	Very Low	Very Low
Direct Positive Impacts			
Socio-Economic Impact Assessment	Moderate	Low / High	Insignificant and/or not identified and/or not applicable

Table H. Overall Impact Significance with the Implementation of Mitigation Measures for Cumulative Negative and Positive Impacts

Specialist Study	Construction	Operational	Decommissioning
Negative Impacts			
Agriculture	Low	Low	Low
Terrestrial Biodiversity and Terrestrial Animal and Plant Species	Low	Low	Low
Aquatic Biodiversity and Species	Very Low	Very Low	Very Low
Avifauna Impact Assessment	Low	Moderate / Low	Low
Visual Impact Assessment	Not Applicable	Very High	Not Applicable
Heritage Impact Assessment (Archaeology)	Low	Low	Insignificant and/or not identified and/or not applicable
Palaeontological Impact Assessment	Low	No impact	No impact
Socio-Economic Impact Assessment	Insignificant and/or not identified and/or not applicable	Insignificant and/or not identified and/or not applicable	Insignificant and/or not identified and/or not applicable
Traffic Impact Assessment	Not rated specifically, however the additional traffic volume does not compromise the level of service of the roads.	Not rated specifically, however the additional traffic volume does not compromise the level of service of the roads.	TIA to be undertaken at decommissioning
Geotechnical Impact Assessment	Low	Low	Low
Bat Impact Assessment	Insignificant and/or not identified and/or not applicable	Low	Insignificant and/or not identified and/or not applicable
Noise Impact Assessment	Insignificant and/or not identified and/or not applicable	Low	Insignificant and/or not identified and/or not applicable
Positive Impacts			
Socio-Economic Impact Assessment	High (depends on the timing of implementation)	High (depends on the timing of implementation)	Not identified

11. OVERALL ENVIRONMENTAL IMPACT ASSESSMENT AND REASONED OPINION FROM THE EAP

The information presented above contributes to this overall environmental impact statement and reasoned opinion from the EAP as to whether the proposed project should or should not be authorised, including any conditions that should be made in respect of the authorisation (should it be granted).

Based on the findings of the detailed specialist assessments and technical studies, which all recommend that the proposed project can proceed and should be authorised by the DFFE, the proposed project is considered to have an **overall Low to Very Low negative environmental impact, and an overall Low to High positive socio-economic impact** (with the effective implementation of respective mitigation and enhancement measures). The proposed project is considered to have an overall **Low to Very Low negative cumulative environmental impact, and an overall highly significant positive cumulative socio-economic impact** (with the implementation of respective mitigation and enhancement measures).

The proposed project will take place within the development footprint on the preferred and approved project site, as contemplated in the accepted Final Scoping Report. The development footprint and buildable areas largely avoid the “no-go” sensitive features identified and mapped by the respective specialists, where relevant and applicable, as discussed in Chapter 6 of the EIA Report. In some cases, linear infrastructure traverse areas of high or very high sensitivity, however the Aquatic Biodiversity, Terrestrial Biodiversity, and Avifauna specialists have confirmed that this is acceptable with recommended mitigation measures. In addition, from a terrestrial biodiversity and species perspective, there is minor encroachment of non-linear infrastructure into provincial CBAs, and High and Very High sensitivity areas identified by the Terrestrial Biodiversity specialist. To this end, the specialist recommended that micrositing should be considered for such non-linear infrastructure.

This EIA has considered the nature, scale and location of the development as well as the wise use of land. When considering the timing of this project, the IRP 2019 proposes to secure 17 800 MW of renewable energy capacity by 2030. It is the Project Applicant’s intention to bid this project in the future bidding rounds of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar tender process. The project would contribute in the order of 270 MW renewable energy generation capacity to national energy generation, which has direct and indirect benefits for national economic growth, especially when noting that wind and solar energy are the lowest cost options for new electricity generation in South Africa.

The proposed project will be in line with and will be supportive of the objective of the Beaufort West, Karoo Hoogland, and Ubuntu Local Municipalities Integrated Development Plans (IDPs) in terms of leveraging the competitive advantages of the significant renewable energy resources in the region and creating more job opportunities. If approved by DFFE, the proposed WEF will provide skills development opportunities, create contractual and permanent employment in the area, and consequently provide catalytic opportunities for downstream economic development.

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 EIA 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 EMPrs in Appendix H of the EIA Report).

The outcomes of this project therefore succeed in meeting the environmental management objectives of protecting the ecologically sensitive areas and supporting sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development in the towns nearest to the project site. The findings of this EIA show that all natural resources will be used in a sustainable manner (i.e., this project is a renewable energy project, and the majority of the negative site specific and cumulative environmental impacts are considered to be of low to very low significance with mitigation measures implemented), while the benefits from the project will promote justifiable economic and social development. Furthermore, all the specialists recommended that the proposed project receive EA.

Taking into consideration the findings of the Scoping and EIA Process and given the national and provincial strategic requirements for infrastructure development, particularly from an electricity generation perspective, and based on the fact that the no-go areas have been predominantly avoided, it is the opinion of the EAP, that the benefits of the project outweigh the costs and that the project will make a positive contribution to sustainable infrastructure development in the affected local and district municipalities.

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

It is understood that the information contained in the EIA Report and appendices is sufficient to make a decision in respect of the activities applied for.

It is recommended that the EAs (should they be granted) be **valid for a period of 10 years**.

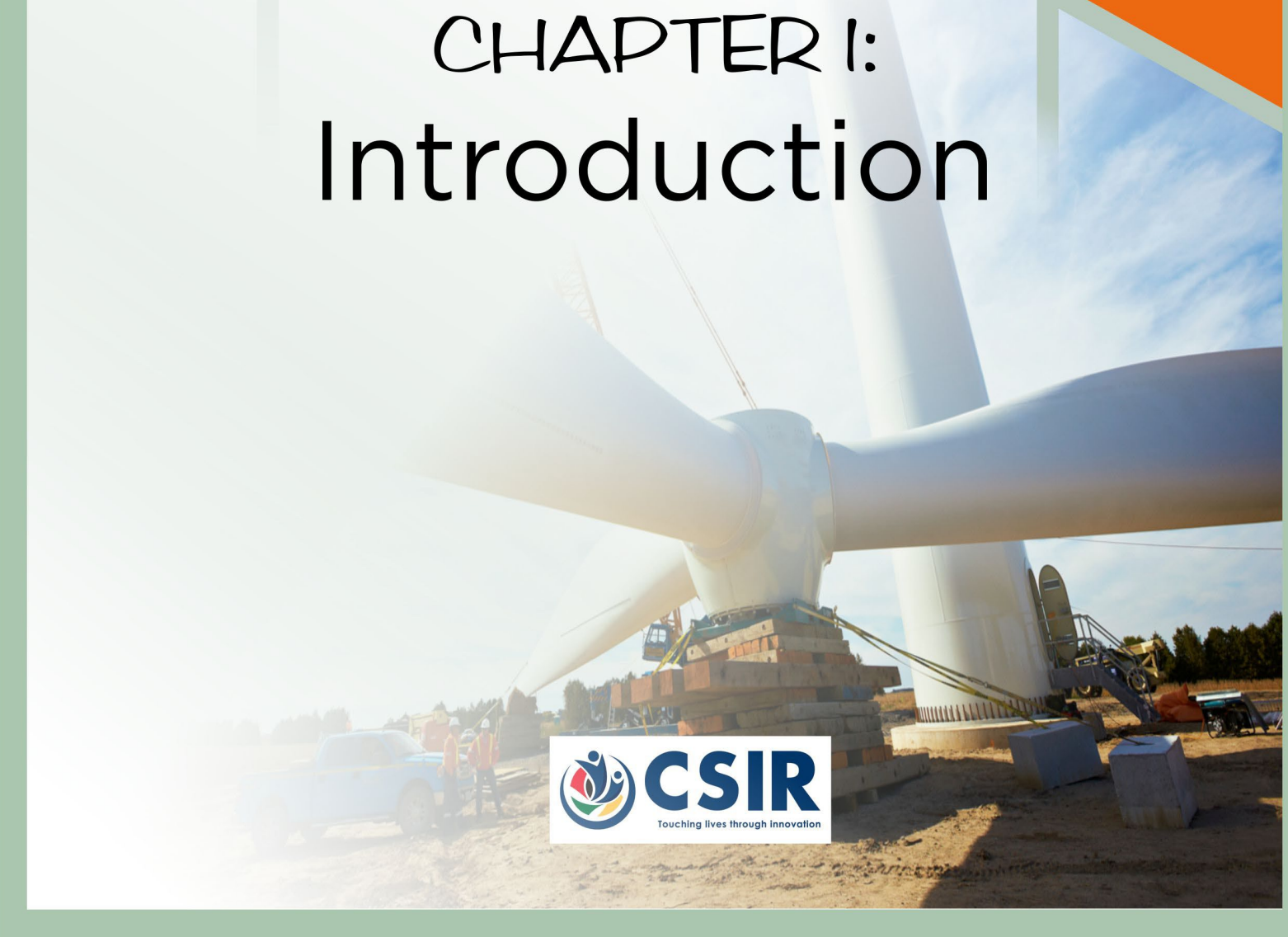
In addition, it is recommended that the EMPrs compiled as part of this EIA Process, included in Appendix H of the EIA Report, be approved concurrently in the EA (should it be granted). A detailed **final** layout of the WEF and associated infrastructure was identified during the EIA Phase and is included in Chapter 7 of the EIA Report, as well as Appendix C and the EMPrs.

Scoping and Environmental Impact Assessment (S&EIA) Process for the Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 1:

Introduction



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Touching lives through innovation

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1. INTRODUCTION

Genesis Eco-Energy Developments (Pty) Ltd (hereafter referred to as "GEED" or the "Project Developer") intends to develop a Renewable Energy Cluster located near Beaufort West within the Beaufort West Local Municipality and the Central Karoo District Municipality in the Western Cape Province (Figure 1.1). One of the Wind Energy Facilities (WEFs) within this cluster, namely the Eland WEF (i.e. this proposed project), extends into the Karoo Hoogland and Ubuntu Local Municipalities in the Northern Cape Province.

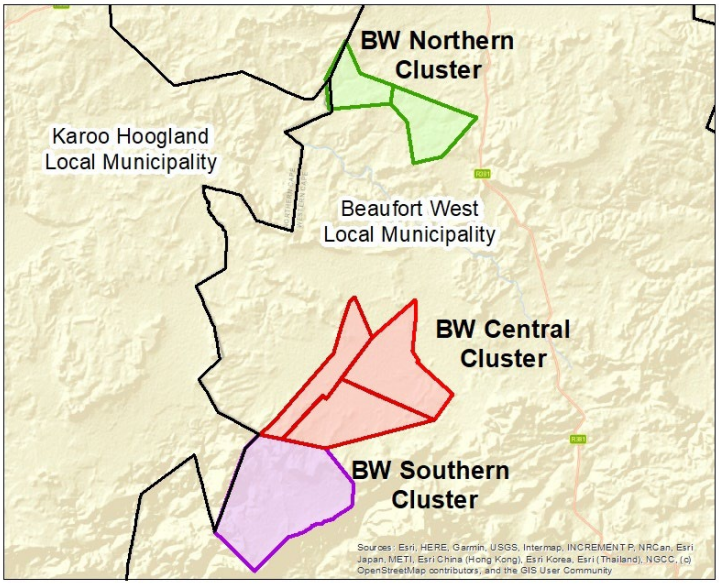

Figure 1.1: GEED Renewable Energy Cluster, located predominantly in the Western Cape near Beaufort West.

The three clusters together with their respective project and applicant names, as well as the status of the relevant Environmental Assessment process, are denoted in Table 1.1.

Table 1.1: GEED Renewable Energy Cluster Proposed Projects, Applicants and Project Status

CLUSTER	PROJECT	APPLICANT	ENVIRONMENTAL ASSESSMENT PROJECT STATUS
Northern	Eland WEF, 132 kV EGI, BESS and associated infrastructure	Genesis Eland Wind Farm (Pty) Ltd	EIA currently underway
	Windy Plains WEF, BESS and associated infrastructure	Genesis Windy Plains Wind Farm (Pty) Ltd	EIA currently underway
Middle	Aloe WEF, 132 kV EGI, BESS and associated infrastructure	Genesis Aloe Wind Farm (Pty) Ltd	Pending (Pre-Application)
	Elegia WEF, 132 kV EGI, BESS and associated infrastructure	Genesis Elegia Wind Farm (Pty) Ltd	Pending (Pre-Application)
	Gazania WEF, 132 kV EGI, BESS and associated infrastructure	Genesis Gazania Wind Farm (Pty) Ltd	Pending (Pre-Application)

CLUSTER	PROJECT	APPLICANT	ENVIRONMENTAL ASSESSMENT PROJECT STATUS
Southern	Beau Valley WEF, BESS and associated infrastructure	Genesis Beau Valley Wind Farm (Pty) Ltd	Pending (Pre-Application)
	Beau Valley SEF, 132 kV EGI, BESS and associated infrastructure	Genesis Beau Valley Solar Farm (Pty) Ltd	Authorised in December 2023
	DBF South WEF, 132 kV EGI, BESS and associated infrastructure	Genesis DBF South Wind Farm (Pty) Ltd	Will no longer be pursued
	DBF South SEF, 132 kV EGI, BESS and associated infrastructure	Genesis DBF South Solar Farm (Pty) Ltd	Authorised in November 2023
Supporting EGI	400 kV External Overhead Transmission Power Line and a 132/400 kV Collector Substation and Associated Infrastructure	Genesis Eco-Energy Developments (Pty) Ltd	Pending (Pre-Application)
	132 kV Windy Plains WEF External Overhead Transmission Power Line	Genesis Eco-Energy Developments (Pty) Ltd	Pending (Pre-Application)
	132 kV Beau Valley WEF Internal Overhead Transmission Power Line	Genesis Eco-Energy Developments (Pty) Ltd	Pending (Pre-Application)

Each of the above-mentioned projects require its own, separate Environmental Authorisation (EA) Applications and will undergo a separate environmental assessment process for decision-making. As noted in Table 1.1, the National Department of Forestry, Fisheries and the Environment (DFFE) granted EAs for the Beau Valley SEF and DBF South SEF in 2023.

This EIA Report only addresses the proposed Genesis Eland Wind Energy Facility (hereafter referred to as the "Eland WEF" or the "proposed project") which is proposed by Genesis Eland Wind Farm (Pty) Ltd, as the applicant.

The proposed WEF will comprise a maximum of 270 MW and will be located approximately 70 km northwest of Beaufort West (Figure 1.2 and Figure 1.3). The proposed project will make use of onshore wind turbine generator technology to generate electricity. The associated infrastructure on site includes *inter alia* various structures, buildings and internal electrical grid infrastructure (EGI), an on-site substation, and a battery energy storage system.

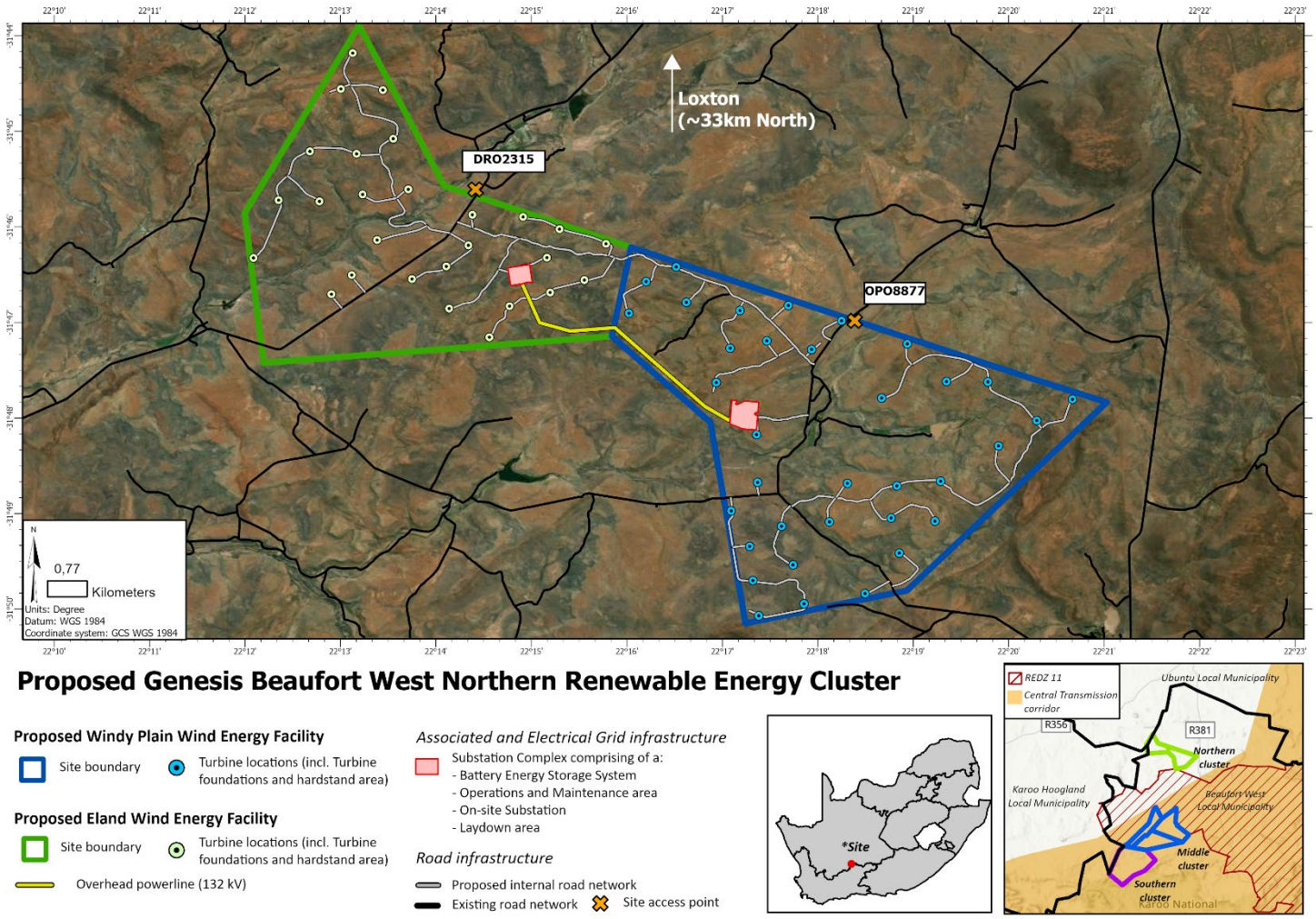

Figure 1.2: Locality map of the GEED Northern Renewable Energy Cluster near Beaufort West in the Western and Northern Cape.

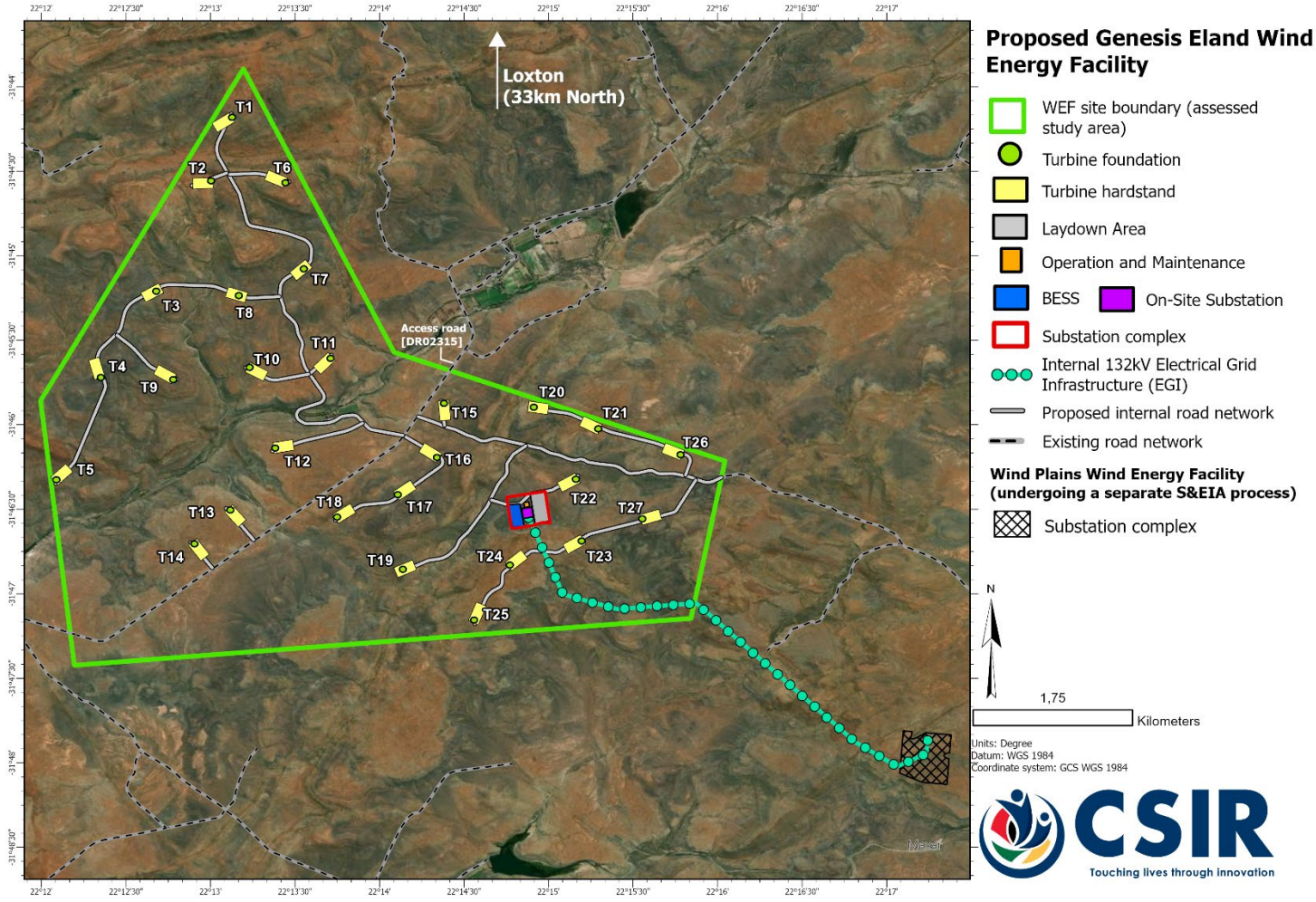

Figure 1.3: Locality map for the proposed Genesis Eland WEF and EGI near Beaufort West in the Western and Northern Cape. Note that the on-site substation and 132 kV power line to connect the proposed project to the Genesis Collector Substation form part of the current application and report.

1.1 Applicability of Regulation 21(2) of the 2014 NEMA EIA Regulations (as amended)

The Final Scoping Reports for the Windy Plains and Eland Wind Energy Facilities (WEFs) (respective original DFFE Reference Numbers: 14/12/16/3/3/2/2424 and 14/12/16/3/3/2/2425) were accepted by the DFFE on 27 November 2023. The CSIR confirmed with the DFFE that the submission date of the Final EIA Reports for the Windy Plains and Eland WEFs was 08 April 2024. Based on various factors, the Final EIA Reports were not submitted by 08 April 2024 and therefore the original applications have lapsed.

Regulation 21 of the 2014 NEMA EIA Regulations (as amended) deals with the submission of Final Scoping Reports to the Competent Authority for consideration (i.e. acceptance or refusal). Specifically, Regulation 21 (2) of the 2014 NEMA EIA Regulations (as amended) states the following:

"(2) Subject to regulation 46, and if the findings of the scoping report is still valid and the environmental context has not changed, the submission of a scoping report as contemplated in subregulation (1) need not be complied with-

- *(a) in cases where a scoping report was accepted as part of a previous application for environmental authorisation and the application has lapsed or was refused because of insufficient information;*
- *(b) on condition that regulation 16 is complied with and that such application is accompanied by proof that registered interested and affected parties, who participated in the public participation process conducted as part of the previous application, have been notified of this intended resubmission of the application prior to submission of such application;*
- *(c) if the application contemplated in paragraph (b) is submitted by the same applicant for the same development, as applied for and lapsed or refused as contemplated in paragraph (a); and*
- *(d) if an environmental impact assessment report and the documents contemplated in regulation 23(1)(a), which must have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority, is submitted within a period of two years from the date of the acceptance of the scoping report contemplated in paragraph (a)."*

Regulation 46 of the 2014 NEMA EIA Regulations (as amended) deals with resubmission of similar applications. It specifically states that "*no applicant may submit an application which is substantially similar to a previous application which has been refused unless the appeal on such refusal has been finalised or the time period for the submission of such appeal has lapsed*". Regulation 46 is not relevant to the Windy Plains and Eland WEF projects because the applications were not refused, and no associated appeals were lodged. The applications only progressed until submission of the Final Scoping Reports which were accepted by the DFFE.

The CSIR will commence with the Draft EIA Phase (without resubmitting the Draft and Final Scoping Reports), on the condition that Regulation 21(2)(a) to (d) noted above are complied with. Refer to Table 1.2 below with feedback on compliance with Regulation 21(2) of the 2014 NEMA EIA Regulations (as amended).

Table 1.2: Compliance with Regulation 21 (2) of the 2014 NEMA EIA Regulations (as amended)

Regulation	Feedback on how this has been complied with in the EIA Process
"(2) Subject to regulation 46, and if the findings of the scoping report is still valid and the environmental context has not changed, the submission of a scoping report as contemplated in subregulation (1) need not be complied with-	▪ Refer to the explanation above regarding Regulation 46, which does **not** apply to the proposed project. ▪ The findings of the Final Scoping Report are still valid, and the environmental context has not changed. Refer to the specialist studies and technical reports in Appendix G of this EIA Report, for additional information in this regard. ▪ Notwithstanding the above, the original DFFE Screening Tool Reports were generated in 2022 or 2023, which informed Site Sensitivity Verifications. To ensure best practice is adopted and to make use of the latest available data, new DFFE Screening Tool Reports were generated in 2025, and the specialists have discussed both the original and 2025 Screening Tool Reports in their studies, where relevant and applicable. ▪ It is important to note that based on resource availability, a new Terrestrial Biodiversity and Species specialist was appointed in May 2025 for the Eland WEF and Windy Plains WEF. <u>This does not change the overall findings of the Final Scoping Report or the environmental context.</u> Refer to additional details provided in the Terrestrial Biodiversity and Species Assessment, included in Appendix G.2 of this EIA Report.
(a) in cases where a scoping report was accepted as part of a previous application for environmental authorisation and the application has lapsed or was refused because of insufficient information;	▪ The Final Scoping Reports for the Windy Plains and Eland WEFs were accepted by the DFFE on 27 November 2023 as part of previous Applications for Environmental Authorisation (EA). The original/previous DFFE Reference Numbers are noted below: o Windy Plains WEF: 14/12/16/3/3/2/2424; and o Eland WEF: 14/12/16/3/3/2/2425. ▪ The above previous EA applications have lapsed.
(b) on condition that regulation 16 is complied with and that such application is accompanied by proof that registered interested and affected parties, who participated in the public participation process conducted as part of the previous application, have been notified of this intended resubmission of the application prior to submission of such application;	▪ Regulation 21 (2) applies to lapsed EA applications. ▪ Therefore, Interested and Affected Parties (I&APs) on the I&AP database for the previous Windy Plains and Eland WEFs Scoping Process (who participated in the Public Participation Process conducted as part of the previous applications) have been notified via email that the previous Applications for EA have lapsed and the Applicant

Regulation	Feedback on how this has been complied with in the EIA Process
	intends to and is ready to resubmit new Applications for EA. This email was sent on 16 September 2025, and proof of such correspondence is included in Appendix E.3 of this EIA Report. It was decided to send this email closer to the re-submission of the applications as a precaution and based on certainty of the application process. Therefore, the I&APs have been notified of the intended resubmission of the Applications for EA prior to the submission of such applications. The applications were submitted in October 2025 together with the Draft EIA Reports. ▪ Regulation 16 of the 2014 NEMA EIA Regulations (as amended) has been complied with; and proof of the above I&AP correspondence has been included with the re-submitted applications. ▪ The re-submitted applications in terms of Regulation 16 of the 2014 NEMA EIA Regulations (as amended) will be considered as "new" applications, with the Applicants being charged the standard application fee, per application, for a Scoping and EIA process. As such, each re-submitted application will receive a new DFFE Reference Number. Proof of the re-submission of the Applications for EA, along with DFFE acknowledgement of receipt, will be included in the Final EIA Reports. The new DFFE Reference Numbers will be communicated in the Final EIA Reports, and during reminder emails sent out to seek comments during the 30-day comment period on the Draft EIA Reports.
(c) if the application contemplated in paragraph (b) is submitted by the same applicant for the same development, as applied for and lapsed or refused as contemplated in paragraph (a); and	▪ The re-submitted Applications for EA are for the same developments as originally applied for (i.e. the Windy Plains and Eland WEFs), and they have the same Applicants. The original applications have lapsed as the Final EIA Reports were not submitted by the April 2024 due date.
(d) if an environmental impact assessment report and the documents contemplated in regulation 23(1)(a), which must have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority, is submitted within a period of two years from the date of the acceptance of the scoping report contemplated in paragraph (a)."	▪ It is intended that the Final EIA Reports for the Windy Plains and Eland WEFs will be submitted within a period of two years from the date of acceptance of the Final Scoping Reports (i.e., two years from 27 November 2023). ▪ Registered I&APs will be informed via email upon submission of the Final EIA Reports to the DFFE for decision-making, and a copy of the reports will be provided online for record purposes.

1.2 Chapter Overview

This chapter provides an introduction of the proposed project, and includes the following:

- An overview of the proposed project and associated infrastructure;
- Project Motivation;
- The legal requirements for an EIA;
- Information on the Project Developer and Project Applicant;
- The Competent Authority and EIA Project Team;
- Details and Expertise of the CSIR EIA Project Management Team;
- Need and Desirability;
- The objectives of the EIA Report; and
- Requirements for an EIA Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (as amended).

1.3 Overview of the Proposed Project

A detailed project description is provided in Chapter 2 of this EIA Report. The proposed project will consist of the following key components:

- Onshore Wind Turbine Generators (WTGs);
- Hardstand / Laydown areas per WTG;
- 132 kV overhead power line (OHPL) from the proposed on-site substation to the Windy Plains WEF on-site substation;
- Auxiliary buildings (including, but not limited to, Operations and Maintenance building (O&M), site office, workshop, staff lockers, bathrooms / ablutions, warehouses, guard houses, etc.);
- Inverter / transformer stations;
- On-site substation;
- On-site medium voltage internal cables;
- Battery Energy Storage System (BESS);
- Internal access roads; and
- Fencing.

The generation capacity for the WEF is up to 270 MW[1]. The construction period is estimated to extend 24 to 30 months. Once the commercial operation date is achieved, the proposed facility will generate electricity for a minimum period of 20 to 25 years.

1.4 Project Motivation

The need for renewable energy is clear, in both a local and international context, with South Africa becoming an integral part of the global transition towards renewable sources of electricity generation. South Africa is one of the highest per capita producers of carbon emissions in the world. These emissions are largely a result of an energy-intensive economy and high dependence on coal-based electricity generation to meet more than 90% of its energy needs. Consequently,

[1] Subject to engineering design and energy yield assessment to be undertaken by the applicant following the environmental authorization process.

the South African government is 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.

Commitment toward decarbonisation of the economy is clearly illustrated in South Africa's National Development Plan (NDP) Vision 2030 published in 2012. Chapters 4 and 5 of the NDP advocates for increased investment in an energy sector that is both economically inclusive and environmentally sustainable – with renewable energy at the core of enabling this transition. The plan identifies, as a priority, the production of sufficient energy to support industry at competitive prices, ensuring access for poor households, while reducing the carbon intensity of the economy.

In addition, due to the current constrained energy landscape and frequent loadshedding, the South African Government has articulated a plan to address the energy crisis. The President of South Africa delivered a speech on 25 July 2022 to inform the public of the plan towards achieving a reliable, affordable and sustainable energy supply (The Presidency, 2022[2]). In addition, the Minister of Forestry, Fisheries and the Environment also held a stakeholder engagement session on 21 July 2022 during which she highlighted proposed mechanisms for streamlining environmental approvals for solar energy development in low and medium sensitivity areas throughout the country; as well as power line and substation development within low and medium sensitivity areas within the gazetted EGI corridors (DFFE, 2022[3]). Some of these mechanisms have already been gazetted for implementation (i.e. the EGI Standard published in Government Gazette (GG) 47095; GN 2313, dated 27 July 2022; Solar Exclusion Norm published in GG 50388; GN 4558, dated 27 March 2024; and Battery Storage Exclusion Norm published in GG 50387; GN 4557, dated 27 March 2024).

Furthermore, on 19 May 2023, the Minister of Forestry, Fisheries and the Environment delivered feedback on the DFFE's Budget Vote 2023/24 (Vote 32) at the Good Hope Chamber in Parliament (DFFE, 2023[4]). The Minister reported that the DFFE IEA Directorate had a review project pipeline of 9 789 MW for renewable energy EA Applications. The Minister also reported that the DFFE had reduced decision-making timeframes for renewable energy EA applications from 107 days to 57 days, as best as possible (DFFE, 2023). The latter was also reiterated during the 2024/25 (Vote 32) DFFE's Budget Vote Speech (DFFE, 2024[5]).

[2] The Presidency (2022). *Address by President Cyril Ramaphosa on actions to address the electricity crisis, Union Buildings, Tshwane.* Accessed online: https://www.thepresidency.gov.za/speeches/address-president-cyril-ramaphosa-actions-address-electricity-crisis%2C-union-buildings%2C-tshwane [August 2022]

[3] DFFE (2022). *Minister Creecy announces improved environmental assessment processes for solar energy.* Accessed online: https://www.dffe.gov.za/creecy_environmentalassessmentprocesses_solarenergy [August 2022]

[4] DFFE (2023). Minister Barbara Creecy: Forestry, Fisheries and the Environment Dept Budget Vote 2023/24. Accessed online: https://www.gov.za/speeches/minister-barbara-creecy-forestry-fisheries-and-environment-dept-budget-vote-202324-19-may [November 2023]

5 DFFE (2024). Minister D George (Dr): 2024/25 Budget Vote Speech (Vote 32) for Forestry, Fisheries and the Environment. Accessed online: https://www.dffe.gov.za/speech/george_dffe2024.25budgetvote32 [July 2024]

Further, 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 an updated report was published in 2013, which proposed to secure 17 800 MW of renewable energy capacity by 2030 (including solar, wind and other energy sources). In August 2011, the then Department of Energy (DoE) (previously operating as the Department of Mineral Resources and Energy (DMRE)[6]) launched the Renewable Energy Independent Power Producer Programme (REIPPPP) and invited potential 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 GN 733, GG 39111. Of this, the additional target allocated for solar PV was 2 200 MW.

The IRP 2019[7] was gazetted by the then Minister of Mineral Resources and Energy, Gwede Mantashe, in October 2019. The update revised the energy forecast for South Africa to the year 2030. Provision has been made for new additional capacity by 2030 including in particular 14 400 MW of wind and 6 000 MW of solar PV. In terms of the REIPPPP, submitted proposals are then evaluated according to a Request for Proposal (RFP). The bidders whose responses rank the highest (according to stipulated criteria) generally have the greatest potential to be appointed as "Preferred Bidders" by the DMRE.

Bidding Window 5 was conducted during 2021 with an allocation of 2 600 MW for new wind and solar energy. The successful bidders were announced on 28 October 2021.

Bidding Window 6 was announced in April 2022 with an allocation of 4 200 MW of renewable energy of which solar comprises 1 000 MW. Six preferred bidders have been selected for Bidding Window 6 for solar PV projects.

Bidding Window 7 was announced in December 2023 and closed in August 2024. It aims to procure 5 000 MW (i.e. 3 200 MW from wind and 1 800 MW from Solar PV). Eight preferred bidders have been selected for Bidding Window 7 for solar PV projects. In July 2025, an additional six solar PV projects, totalling 1 290 MW, were allocated as preferred bidders in Bid Window 7. This involved a re-allocation of the MW from onshore wind to solar PV in this Bid Window (Department of Electricity and Energy, 2025[8]).

Should this proposed project be acceptable and authorised, it is considered viable that long-term benefits for the community and society in the Beaufort West area would be realised. The proposed project will provide an opportunity for additional employment in an area where job creation is identified as a key priority. Approximately 250-350 employment opportunities will be created during the construction phase, and approximately 35-45 during the operational phase of the proposed project. The proposed project will make use of local labour as much as possible.

[6] Following the announcement of the National Executive of the 7th Administration, it is understood that the Ministries of Electricity and Energy will be merged; and that there will be a separate Ministry of Mineral and Petroleum Resources. For purposes of this EIA Report, the term DMRE has been retained for simplicity.

[7] The IRP was updated in 2023 (2023 Draft IRP) and released for public comment in January 2024. It has not been gazetted for implementation yet.

[8] Department of Electricity and Energy (2025). REIPPPP Bid Window 7 List of Successful Bidders [Online]. Available at: https://www.ipp-projects.co.za/ [Accessed: September 2025].

The project is intended to address the current energy shortages in South Africa and assist in meeting the need for additional renewable energy generation capacity, as required by the IRP of 2019. The total generation capacity of the project is up to 270 MW.

The proposed project would also have international significance as it contributes 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.

It is intended that this project will be bid into a future bidding program of the REIPPPP [or another future process linked to the IRP]. To submit a Bid in terms of the REIPPPP, the Project Applicant is required to have obtained an EA in terms of the 2014 NEMA EIA Regulations (as amended), as well as several additional authorisations or consents. Alternatively, the project may be considered for private-offtake and/or any other viable commercial and industrial agreements.

1.5 Legal Requirements for an EIA

Section 24(1) of the NEMA, states that "*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 EA*". The reference to "listed activities" relates to the regulations promulgated in GN R982, R983, R984 and R985 in GG 38282, dated 4 December 2014, which came into effect on 8 December 2014. These were amended on 7 April 2017, specifically promulgated in GN R326, R327, R325 and R324 in GG 40772; and further amended on 11 June 2021 in GN 517; and on 3 March 2022 in GN 1816. GN R327 and GN R324 includes listed activities that trigger the need for a BA Process, whereas GN R325 includes listed activities that trigger the need for a full Scoping and EIA Process. Additional detail is provided in Chapter 4 of this EIA Report.

In terms of the NEMA and the 2014 NEMA EIA Regulations (as amended), a full Scoping and EIA Process is required for the proposed project.

The proposed project is not located within any of the Renewable Energy Development Zones (REDZs) that were gazetted in GG 41445, GN 114 on 16 February 2018; and GG 44191, GN 144 on 26 February 2021, hence it is subjected to a full Scoping and EIA Process, as opposed to a BA Process allowed for in the REDZs. It should be noted however that the proposed project falls within 8 km of the Beaufort West REDZ 11. In addition, the project is not located within any of the Strategic Transmission Corridors gazetted in GN 113 of 16 February 2018; however, it is located approximately 16 km outside of the Central Strategic Transmission Corridor.

The need for the full Scoping and EIA is triggered by, amongst others, the inclusion of Activity 1 listed in GN R325 (Listing Notice 2):

- ***"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facility or infrastructure is for photovoltaic installations and occurs (a) within an urban area; or (b) on existing infrastructure".***

Chapter 4 of this EIA Report contains the detailed list of activities contained in GN R327, R325, and R324, which may be triggered by the various project components and thus form part of the Scoping and EIA Process.

The Project Applicant has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the Scoping and EIA Process for this proposed project in order to determine the potential biophysical, social and economic impacts associated with undertaking the proposed activities. Given that energy related projects have been elevated to national strategic importance in terms of the Scoping and EIA Process, the proposed WEF requires EA from the National DFFE as the Competent Authority (CA), acting in consultation with other spheres of government.

The purpose of the Scoping and EIA Process is to identify, assess and report on any potential impacts the proposed project, if constructed and implemented, may have on the receiving environment. The environmental assessment, therefore, needs to show the CA what the potential biophysical and socio-economic impacts will be of the proposed project. It also needs to show the CA how such impacts can be avoided, remedied, mitigated, or managed, and how positive impacts can be enhanced.

1.6 Project Developer

Genesis Eco-Energy Developments (GEED) was established in 2001 and is one of South Africa's pioneering renewable energy companies providing project development, management and operations services across a range of renewable energy technologies. Their focus is on free fuel renewable energy (wind, solar PV and marine technologies), as well as bio-energy and BESS.

GEED employs a team of highly experienced people who have worked locally and internationally in areas ranging from energy strategy, policy formulation, energy trading, financial services, environmental, land, agriculture and rural development, through to project design, development, management and implementation. Their team has developed and implemented projects in a number of countries and bring this expertise and experience to bear when designing and implementing projects in South Africa and the SADC region.

Genesis has helped to develop a number of wind and solar PV projects with two 50 MW projects having been selected as Preferred Bidders in Round 1 of the REIPPPP.

The Droogfontein and De Aar projects have both completed construction and Genesis exited these projects through sale to incoming investors.

Currently Genesis is developing a number of wind, solar PV, and BESS projects across the country, which it will be submitting for future rounds of the REIPPPP.

1.7 Project Applicant

The Project Applicant for the proposed project is **Genesis Eland Wind Farm (Pty) Ltd,** a special purpose vehicle set up by the Project Developer to undertake the proposed project.

1.8 Competent Authority

The 2014 NEMA EIA Regulations, as amended in GN 517 on 11 June 2021 states that the Competent Authority (CA) in respect of the listed activities "*is the CA in the province in which the activity is to be undertaken, unless: (a) it is an application for an activity contemplated in Section 24C(2) of the Act, in which case the CA is the Minister or an organ of state with delegated powers in terms of Section 42(1) of the Act; or (b) the application is a mining application in which case the CA is the Minister responsible for mineral resources*".

With relevance to the proposed project, Section 24C (2) (a) (i) of NEMA states "*(2) the Minister must be identified as the competent authority in terms of subsection (1), unless otherwise agreed to in terms of section 24C (3), if the activity (a) has implications for international environmental commitments or relations, and where (i) it is identified by the Minister by notice in the Gazette*".

Related to this, GN 779 states that, in terms of Sections 24C(1), 24C(2)(a)(i) and 24D of the NEMA, the Minister of Environmental Affairs (now Forestry, Fisheries and the Environment) is the CA for activities which are identified as activities in terms of Section 24(2)(a) of NEMA, which may not commence without an EA, and which relates to the IRP 2010 - 2030 and any updates thereto. The proposed project triggers various listed activities and thus requires EA. As noted above, the proposed project will be bid into a future bidding program of REIPPPP.

Based on the above, the National DFFE serves as the CA for the proposed project.

1.9 S&EIA Project Team

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), the CSIR Environmental Management Services (EMS) group has been appointed to undertake the required Environmental Assessment Processes in order to determine the potential biophysical, social and economic impacts associated with the proposed developments, and to identify how such negative impacts can be avoided, remedied, mitigated or managed; and how positive impacts can be enhanced.

The project team, which is involved in this Scoping and EIA Process, is listed in Table 1.3 below. This team includes several specialists who have extensive experience in conducting specialist studies for renewable energy projects in South Africa.

Table 1.3: The S&EIA Project Team

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
CSIR Environmental Management Services		
Paul Lochner *(Registered EAP (2019/745))*	CSIR	EAP, Technical Advisor and Quality Assurance
Rohaida Abed *(Pr.Sci.Nat. and Registered EAP (2021/4067))*	CSIR	Project Team Member
Helen Antonopoulos *(Cand.Sci.Nat.)*	CSIR	Project Manager
Dhiveshni Moodley *(Pr.Sci.Nat.)*	CSIR	GIS Specialist
Suvasha Ramcharan *(Cert.Sci.Nat.* and *Cand. EAP)*	CSIR	Project Officer
Sonto Mkize *(Cand. Planner)*	CSIR	Project Officer
Rinae Tsedu (*Cand. EAP)*	CSIR	Project Officer
Kimara Moodley (*Cand. EAP)*	CSIR	Project Officer
Specialists		
Johann Lanz (*Pr.Sci.Nat.)* David Lakey	SoilZA	Agriculture Compliance Statement
Corné Niemandt[9] (*Pr.Sci.Nat.)*	Bios Diversitas Consultants	Terrestrial Biodiversity and Terrestrial Animal Species Impact Assessment and Terrestrial Plant Species Compliance Statement
Toni Belcher *(Pr.Sci.Nat.)*	Blue Science	Aquatic Biodiversity and Species Impact Assessment
Albert Froneman (*Pr.Sci.Nat.)*	AfriAvian Environmental	Avifauna Impact Assessment
Lourens du Plessis *(GPr GISc)* Tosca de Villiers *(SACLAP and EAPASA Registered)*	LOGIS NuLeaf Planning and Environmental (Pty) Ltd	Visual Impact Assessment
John Gribble (*ASAPA Registered*)	TerraMare Archaeology	Heritage Impact Assessment (Archaeology and Cultural Landscape)
Elize Butler	BANZAI Environmental	Palaeontology Impact Assessment
Sue Reuther Duncan Keal	SLR Consulting	Socio-Economic Impact Assessment
Athol Schwarz (*Pr. Tech.*)	Private	Traffic Impact Assessment
Debbie Mitchell *(Pr Eng)*	Ishecon cc	Battery Storage High Level Safety, Health and Environment Risk Assessment
Louis Jonk (*Pr.Sci.Nat.)*	GEOSS South Africa	Desktop Geotechnical Assessment
Stephen Burton (*Pr.Sci.Nat.)* Dr Owen Davies (*Pr.Sci.Nat.)*	ERM Consulting	Bat Species Impact Assessment
Dr Brett Williams Jason Hutten	Safetech	Noise Impact Assessment
Helen Antonopoulos (*Cand.Sci.Nat.)* Lizande Kellerman[10] *(Pr.Sci.Nat.)*	CSIR	Civil Aviation Site Sensitivity Verification
Helen Antonopoulos (*Cand.Sci.Nat.)*	CSIR	Defence Site Sensitivity Verification

[9] Based on resource availability, a new Terrestrial Biodiversity and Species specialist was appointed in May 2025 for the Eland WEF and Windy Plains WEF.
[10] This staff member resigned from the CSIR at the end of July 2025.

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Lizande Kellerman[2] *(Pr.Sci.Nat.)*		

Feedback on the specialist studies commissioned as part of this Scoping and EIA Process is also included in Chapter 3, Chapter 4, Chapter 6, and Chapter 7 of this EIA Report. Chapter 4 also includes motivation for not undertaking certain studies identified by the Screening Tool.

1.10 Details and Expertise of the CSIR S&EIA Project Management Team

This section provides information on the expertise of the CSIR S&EIA Project Management Team and Environmental Assessment Practitioner (EAP).

Paul Lochner (*Registered EAP*; Technical Advisor and Quality Assurance):
Paul Lochner is an EAP at the CSIR in Stellenbosch, with 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 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, EGI, desalination, oil and gas, wetlands and coastal zone management, and industrial and 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 and 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).

Rohaida Abed (*Registered EAP*; *Pr. Sci. Nat., Project Team Member*)
Rohaida Abed is a Senior EAP at the CSIR in Durban. She has 15 years of experience in the Environmental Management field. She has experience in conducting Environmental Assessments relating to Renewable Energy, Electricity Grid Infrastructure, Port infrastructure, and Bulk Liquid Storage facilities. She has also been involved in Screening Studies, Applications for Amendments to Environmental Authorisations, Environmental Management Programmes, Legislative Reviews and reviewing Specialist Studies. She was also the Project Manager for the national Gas Pipeline and Electricity Grid Infrastructure Expansion SEAs.

Helen Antonopoulos (*Cand. Sci. Nat.*, Project Manager):
Helen Antonopoulos is a Junior Environmental Consultant at the CSIR in Stellenbosch. Helen holds BSc, BSc Honours, and MSc degrees in Environmental and Geographical Science from the University of Cape Town. She has assisted with compiling EA Applications, Scoping and EIA Reports, BA Reports, and EMPrs for various renewable energy and associated EGI projects across

various provinces. Helen is a registered Candidate Natural Scientist (169440) with the South African Council for Natural Scientific Professions (SACNASP).

Dhiveshni Moodley (*Pr. Sci. Nat.*, GIS Specialist):
Dhiveshni Moodley is a Junior Environmental Scientist at the CSIR in Durban. Dhiveshni holds a BSc, BSc Honours (*cum laude*) and MSc (*cum laude*) degrees in Environmental Science from the University of KwaZulu-Natal. She has five years' work experience in flood risk, hydropedological- 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 a registered Professional Natural Scientist (1472997/19) with SACNASP.

Suvasha Ramcharan (*Cert. Sci. Nat.*, *Cand. EAP*, Project Officer):
Suvasha Ramcharan is a Junior Environmental Scientist at the CSIR in Durban. Suvasha holds a Bachelor of Science, Bachelor of Science Honours, and Master of Science (*cum laude*) degrees in Environmental Science from the University of KwaZulu-Natal. She has assisted with compiling numerous EA Applications, Scoping and EIA Reports, BA Reports and EMPrs for various renewable energy and associated electricity grid infrastructure projects in the Eastern Cape, Western Cape, Northern Cape, Free State and Mpumalanga. Suvasha is a registered Certificated Natural Scientist (159219) with SACNASP and is a registered Candidate EAP (2023/6896) with EAPASA.

Sonto Mkize (*Cand. Planner*, Project Officer):
Sonto holds a BSc and BSc Honours in Urban and Regional Planning from the University of the Witwatersrand, and a MSc in Sustainable Urban Planning and Design from KTH Royal Institute of Technology. She has assisted in compiling Basic Assessment and Scoping and Environmental Impact Assessment reports for wind and solar energy facilities in various provinces. Her key interests lie in maximising the opportunities presented by advancements in technological innovations to build inclusive smart cities and to enable a just energy transition using renewable resources. Sonto is a registered Candidate Planner (C/10241/2025) with the South African Council for Planners (SACPLAN).

Rinae Tsedu (*Cand. EAP*, Project Officer):
Rinae Tsedu is an Environmental Consultant at the CSIR in Durban. She has one year of experience in the environmental and management sector, specifically in SEAs for renewable energy, as well as EIAs and GIS for environmental, construction, and renewable energy projects. She has also been involved in Environmental Screening Studies and green hydrogen strategy implementation plans. Rinae is a registered Candidate EAP (2024/6210) with EAPASA.

Kimara Moodley (*Cand. EAP*, Project Officer):
Kimara Moodley is an Environmental Consultant at the CSIR in Durban. Kimara Moodley holds a Master of Science in Environmental Science and a Bachelor of Science Honours in Geography from the University of KwaZulu-Natal where she also completed a Bachelor of Social Science in Geography and Environmental Management. Kimara is a registered Candidate EAP (2024/9394) with EAPASA.

1.11 Need and Desirability

It is an important requirement in the EIA Process to review the need and desirability of the proposed project. Need and desirability requires an analysis of the effect that the proposed project may have on social, economic and ecological systems, and places emphasis on consideration of a project's justification in terms of the specific needs and interests of people. The consideration of need and desirability in EIA decision-making therefore requires the consideration of the strategic context of the project along with broader societal needs and the public interest.

Guidelines on Need and Desirability were published by the Department of Environmental Affairs (DEA) [now operating as the DFFE] in 2017[11]. 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 1.4 includes a list of questions based on the DEA's Guideline to determine the need and desirability of the proposed project. This table is informed by the outcomes of the Scoping and EIA Process, including the Specialist Assessments. Note that the Specialist Assessments are included in Appendix G of this EIA Report, and where relevant, the findings of these studies have been integrated into the table.

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

Table 1.4: 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?: 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 attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure, 1.1.3. Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"), 1.1.4. Conservation targets, 1.1.5. Ecological drivers of the ecosystem, 1.1.6. Environmental Management Framework, 1.1.7. Spatial Development Framework, and 1.1.8 Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).	The ecological sensitivities present within the study area have been assessed in detail in the Terrestrial Biodiversity and Plant and Animal Species, Aquatic Biodiversity, Bats, and Avifauna Impact Assessments. These Specialist Assessments are included in Appendix G of this EIA Report. Considering all fieldwork data, necessary and available biospatial data, relevant biodiversity policies and plans, as well as any Environmental Management Frameworks and Spatial Development Frameworks, if applicable and where available, the specialists have identified aquatic, terrestrial, avifaunal and bat sensitive areas within the study area[12] that should be avoided. The layout has been refined through an iterative design process to avoid the no-go areas identified by the specialists. In some areas linear infrastructure, such as access roads or the power line, traverse these very high or high sensitivity areas. The relevant specialists have permitted the linear infrastructure located within these areas, as adequate mitigation measures have been provided and incorporated into the relevant Environmental Management Programmes (EMPrs). The mitigation measures guide suitable development within these areas so that the ecological integrity is maintained. The Terrestrial Biodiversity and Plant and Animal Species Assessment (Appendix G.2 of this EIA Report) determined the following: ▪ The proposed WEF development is located in the Upper Karoo Key Biodiversity Area (KBA). It is not located within a Protected Area (PA), the closest being the Karoo National Park but a section is located in a NPAES focus areas.

[12] The study area or preferred site for the proposed Eland WEF and associated infrastructure is the full extent of the affected farm properties on which the proposed project and associated infrastructure is planned to be constructed. The terms "site" and "study area" are used synonymously in this report. Refer to Chapter 2 for additional information regarding the study area.

NEED	
Question	**Response**
	▪ The entire WEF site is broadly classified as falling within the Eastern Upper Karoo vegetation type listed as Least Concern. ▪ The WC BSP indicates that the majority of the study area is mainly located within Other Natural Areas (ONA) with ESA 2 terrestrial features interspersed throughout the landscape and some areas of terrestrial CBA 2, which differ from the 2017 WC BSP. There are no turbines located in the terrestrial CBA 2, but sections of two turbine hardstands (numbers 20 and 21) intersect with it. ▪ The NC BSP indicates that the western boundary of the study area is located within a CBA 1 with small sections of the site located in ONA (Figure 12). The NC BSP CBA 1 is owing to the presence of threatened mammal and threatened tortoise, whereas the WC BSP indicates this same area as only ONAs. The Aquatic Biodiversity and Species Assessment (Appendix G.3 of this EIA Report) determined the following: ▪ There are no mapped natural FEPA Wetlands and National Wetland Map areas within the site. ▪ The 2023 WCBSP indicates that the watercourses are all mapped as aquatic ESA1s, except for the mainstem of the Elandsfontein River that is mapped as Nama Karoo Ephemeral Upper Foothill CBA1. Some aquatic ESA2s occur where there is localised disturbance within the watercourses, such as at the dams and along roads on the watercourses. The Avifaunal Species Assessment (Appendix G.4 of this EIA Report) determined the following: ▪ The project site is located within the Upper Karoo KBA (KBA ID 100967). The avifaunal trigger species found in this KBA are Blue Crane (Vulnerable), Black Harrier (Endangered) and Ludwig's Bustard (Endangered). ▪ A total of 173 species could potentially occur within the Broader Area where the proposed project is located. Of these, 31 are classified as priority species for wind energy developments. Of the 31 WEF priority species, 15 were recorded at the Project Site during the pre-construction monitoring surveys. Nine Red Data species

NEED	
Question	**Response**
	(i.e., Species of Conservation Concern – SCC) were recorded during the pre-construction monitoring surveys. Refer to the Bats Assessment (Appendix G.12 of this EIA Report) for information on the ecological sensitivities present within the study area. The combined environmental feature map and the combined environmental sensitivity map (inclusive of no-go areas) are included in Chapter 6 and Appendix C of this EIA Report. These specialists concluded that the proposed project could proceed provided that the recommended mitigation measures and management actions provided are implemented. Therefore, the proposed development would not unacceptably compromise the ecological integrity of the context and associated conservation goals, and would be developed in support of responding to climate change and the South African energy crisis through development of a renewable energy facility.
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?	The ecological sensitivities present within the study area have been assessed in detail in the Terrestrial Biodiversity and Plant and Animal Species, Aquatic Biodiversity, Bats, and Avifauna Impact Assessments. These Specialist Assessments are included in Appendix G of this EIA Report. The Aquatic Biodiversity, Terrestrial Biodiversity, Avifauna, and Bats specialists have identified all ecological sensitive areas on site that should be avoided by the proposed development and have recommended mitigation measures, management actions and monitoring programmes to limit, reduce and/or minimise potential impacts to ensure that the ecological integrity and biodiversity of the areas is maintained. The combined environmental feature map and the combined environmental sensitivity map (inclusive of no-go areas) are included in Chapter 6 and Appendix C of this EIA Report.

NEED	
Question	**Response**
	Measures to avoid, remedy, mitigate and manage impacts are included in the Environmental Management Programmes (EMPrs) (Appendix H of this EIA 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?	Various Specialists Assessments have been compiled and are included in this EIA Report. These assessments have identified sensitivities within the study area that should be avoided, based on desktop assessments and field work. This has informed the identification of the Buildable Areas / development footprint, as well as the revised development footprint and layout plan. Note that the current proposed site layout plan has intentionally been designed to avoid and therefore remain well outside of environmentally sensitive areas identified during the EIA Phase, where practically possible. The assessments have identified various potential negative impacts that the proposed project may result in, such as degradation to the biophysical environment and potential pollution. The associated mitigation measures have also been identified. Refer to the detailed specialist assessments in Appendix G of this EIA Report. Measures to avoid, remedy, mitigate or manage biophysical impacts are included in the EMPrs (Appendix H of this EIA 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 proposed project. The following waste materials are expected during the construction phase: ▪ Packaging material, such as the cardboard, plastic and wooden packaging and off-cuts; ▪ Hazardous waste from empty tins, oils, soil containing oil and diesel (in the event of spills), and chemicals; ▪ Building rubble, discarded bricks, wood and concrete; ▪ Domestic waste generated by personnel; and ▪ Vegetation waste generated from the clearing of vegetation. Waste generated on site would be disposed of at a licenced landfill site or removed by a private contractor, depending on the availability of such services in the area. Measures to avoid, remedy, mitigate or manage waste are included in the EMPrs (Appendix H of this EIA Report).

NEED	
Question	**Response**
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?	The proposed site layout plan has been intentionally designed to avoid sensitive areas, including sensitive heritage features and visual receptors. A Heritage Impact Assessment (HIA) has been undertaken in the EIA Phase to assess potential archaeological and cultural impacts resulting from the proposed project. Refer to the HIA included in Appendix G.6 of this EIA Report for a list of potential impacts that have been identified from a heritage perspective. The Heritage Specialist has also recommended mitigation measures that should be implemented to mitigate negative impacts. These mitigation measures are included in the HIA (Appendix G.6 of this EIA Report) and have also been fully incorporated into the EMPrs, which are included in Appendix H of this EIA Report. The HIA will be sent to Heritage Western Cape and the South African Heritage Resources Agency (SAHRA) for comment during the 30-day comment period on the Draft EIA Report. A Palaeontology Impact Assessment (PIA) has been undertaken in the EIA Phase to assess potential palaeontological impacts resulting from the proposed project and is included in Appendix G.7 of this EIA Report. The PIA notes that both the South African Heritage Resources Information System (SAHRIS) Palaeontological Sensitivity Map and the 2023 and 2025 Screening Tool depicts a Very High Palaeontological Sensitivity for the study area. The specialist found that this provisional assessment is in agreement with the actual findings in the field due to the identified fossil sites found during the ten-day palaeontological site investigation. The specialist has recommended that the Chance Finds Protocol be immediately implemented if palaeontological heritage is uncovered during surface clearing or excavations. The Chance Finds Protocol has been fully incorporated into the EMPrs, which are included in Appendix H of this EIA Report, to ensure that it is fully implemented during the construction phase. The PIA confirms that there are no fatal flaws from a palaeontological perspective, and the specialist has recommended that the proposed project receive EA provided that the recommended mitigation measures are included in the EMPrs and implemented in full during the construction phase. Refer to Appendix G.7 of this EIA Report for the recommended mitigation measures. These mitigation measures have also been fully incorporated into the EMPrs, which are included in Appendix H of this EIA Report.

NEED	
Question	**Response**
	Also from a landscape perspective, a Visual Impact Assessment (VIA) was also undertaken during the EIA Phase to identify the important visual features and receptors within the surrounding landscape, particularly the features and characteristics contributing to scenic quality and how and to what degree the proposed projects will impact on these scenic values. The Visual specialist has indicated that the visual impacts associated with the proposed project are deemed to fall within acceptable limits, provided that the recommended mitigation measures are fully implemented and maintained. Refer to the VIA included in Appendix G.5 of this EIA Report for additional information.
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?	The proposed project aims to harness the wind resource available in the area for the generation of electricity, which is needed in South Africa given the backdrop of regular load-shedding. This project is seen as a source of 'clean energy' and reduces the dependence on non-renewable sources such a coal. Measures to avoid, remedy, mitigate or manage potential impacts on non-renewable natural resources that might be present in the study area are included in the EMPrs (Appendix H of this EIA 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 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? 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. de-materialised 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)	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 a need to identify alternative resources that could promote sustainable energy as well as cleaner energy production mechanisms. The proposed project aims to harness the wind resources available in the area for the generation of electricity. This project is seen as a source of 'clean energy' and reduces the dependence on non-renewable sources. The proposed project is intended to form part of the REIPPPP and therefore aims to contribute to the energy mix of South Africa, in line with the IRP. The need for renewable energy is clear, with South Africa becoming an integral part of the global transition towards renewable sources of electricity generation and it is integral to alleviating South Africa's energy insecurity. An assessment of the project alternatives including the site suitability for the proposed development is included in Chapter 5 of this EIA Report. The proposed project is a sustainable option for the area, and the footprint has as far as possible, avoided areas of very high and high environmental sensitivity, and has been designed to make use of

NEED	
Question	**Response**
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?) 1.7.3. Do the proposed location, type and scale of development promote a reduced dependency on resources?	existing roads, tracks, and disturbed areas as far as possible. Where impacts cannot be avoided, the footprint has been placed to minimise, mitigate, or manage potential impacts to the receiving environment. In this regard, in some areas, linear infrastructure such as internal roads and power lines traverse high sensitive areas, which is permitted by the relevant specialists as adequate mitigation measures have been provided and incorporated into the EIA Phase. Furthermore, no fatal flaws were identified that could prevent the proposed project from being realised, should such authorisation be granted. In addition, various Specialist Assessments have been compiled and are included in Appendix G of this EIA Report. These assessments have identified various potential negative impacts that the proposed project may result in. The associated mitigation measures have also been identified in these Specialist Assessments and included in the EMPrs, as relevant (Appendix H of this EIA Report). Furthermore, as mentioned above, the proposed development is not anticipated to result in unacceptable compromise of the ecological function of the context and as attested to the Agricultural Compliance Statement (Appendix G.1 of this EIA Report), the proposed development would also not compromise the current agricultural use of the site. Agricultural use would be able to continue alongside the proposed WEF, which would serve to diversify income for landowners with the proposed WEF being more stable over the long-term.
1.8. How were a risk-averse and cautious approach applied in terms of ecological impacts? 1.8.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)? 1.8.2. What is the level of risk associated with the limits of current knowledge? 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?	The precautionary approach has been adopted for this study, i.e., assuming the maximum development scenario will occur and then identifying ways to mitigate or manage these impacts. Current gaps in knowledge include, for example, confirmation on the preferred turbine type and model to be installed at this site. Ways in which these gaps are addressed are to consider the worst-case/maximum development scenarios as noted above in terms of turbine size and generation capacity. A range of specifications have been provided as new technology may also come onto the market closer to the construction period (should the proposed WEF be approved). Refer to Chapter 2 of this EIA Report for a description of the project specifications currently being considered for the proposed WEF project. It

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Question	**Response**
	is important to note at the outset that the exact specifications of the proposed project components will only be determined and confirmed during the detailed engineering design phase (subsequent to the issuing of an EA, should such an authorisation be granted) but that the information being provided is seen as the maximum proposed development footprint for the proposed project. In addition, the specialist assessments have provided detailed feedback on applicable uncertainties, assumptions, and risks associated with limits of current knowledge. These are captured in Appendix G of this EIA Report.
1.9. How will the ecological impacts resulting from this development impact on people's environmental right in terms following: 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? 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?	A detailed Socio-Economic Impact Assessment (SIA) was conducted for this proposed project and is included in Appendix G.8 of this EIA Report. A socio-economic profile is also included in Chapter 3 of this EIA Report. The SIA notes that the proposed projects will provide significant socio-economic benefits, related to economic growth, employment and financial contributions to the nearby communities. The study identifies various enhancement measures, which should be implemented to maximise the potential benefits. Such measures have been included in the EMPrs as relevant. The findings also indicate that the potential negative impacts associated with the construction phase are likely to be low to very low for the proposed project. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. Additionally, aspects relating to the potential negative impact of the proposed development water quality, nuisance (noise, odour, etc.) and visual aesthetics are not strictly socio-economic issues but have been addressed and are included as specialist assessments in Appendix G.6 (HIA), Appendix G.13 (Noise Impact Assessment), and Appendix G.5 (VIA) of this EIA Report. The SIA notes that there are no third parties using resources (including amenities) on the site. Also, note that in cases where there are no specific positive impacts identified, there also has not been an unacceptable negative impact identified. It is however important to note that access to clean energy would be significantly improved. Overall, the proposed development would not compromise on the general people's environmental rights.

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Question	**Response**
	Therefore, the proposed project and its associated infrastructure are thus supported by the findings of the SIA.
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.)?	Linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area have been considered in this Scoping and EIA Process. Based on the findings of the specialists, there would be no unacceptable adverse impacts across the themes. The SIA (Appendix G.8 of this EIA Report) explains that there are two significant factors that motivate these projects i.e. more secure power generation (reducing the probability of load shedding and the many socio-economic costs of such outages) and generation of renewable power (contributing to the reduction of social and economic risks from climate change). The provision of renewable energy will result in an improvement in human well-being as well as livelihoods both locally and regionally. There are no harmful emissions associated with renewable energy as compared to other energy sources such as coal. A shift towards renewable energy would help reduce South Africa's reliance on fossil fuels for energy, thus reducing carbon emissions. Therefore, renewable energy enhances human well-being. Refer to the SIA and BESS High Level Safety, Health and Environment Risk Assessment (Appendix G.10 of this EIA Report) for additional information.
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?	The impacts on ecological integrity objectives of the area are considered as part of the Terrestrial Biodiversity and Plant and Animal Species, Aquatic Biodiversity, Bat, and Avifauna Impact Assessments. These studies concluded that the proposed development will not pose any unacceptable adverse impacts on the ecological integrity objectives of the area as the proposed site layout plan has avoided all sensitive ecological features on site, as far as practically possible.
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	Chapter 5 of this EIA Report includes a full description of alternatives assessed during the S&EIA Process. The no-go alternative and technology alternatives (relating to the BESS) have been assessed. Note that the specialists have assessed Lithium-Ion, Sodium-Ion and Redox Flow BESS technologies and all three are deemed acceptable. The preferred

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in the selection of the "best practicable environmental option" in terms of ecological considerations?	technology is discussed in Chapter 7 of this EIA Report (Conclusions and Recommendations). The approach followed to identify the buildable areas was to use environmental and social constraints to avoid sensitive features, thus applying mitigation hierarchy thinking. This approach replaces the need to rank alternative sites and locations, as it leads to the selection of the least sensitive development footprint. As noted above, linear infrastructure is permitted to cross some of these areas as the specialists have provided adequate mitigation measures. The proposed development would not result in unacceptable compromise in any of the environmental themes assessed. Further, the proposed development would contribute to the generation of renewable energy in a province and country which requires electricity and reduced reliance on coal-based power (in terms of the country's IRP).
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 assessed the potential cumulative impacts of these proposed projects. Refer to Appendix G of this EIA Report where the potential cumulative impacts are discussed for these projects, where relevant. Chapter 6 of this EIA Report contains a list of all other renewable energy and EGI projects within the 30 km radius that have been considered in the cumulative impact assessment. The Visual, Bats, and Avifaunal Assessments have considered a 50 km radius. Note that no residual cumulative impacts of very high significance were rated by the specialists, and no fatal flaws are present.
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.	The proposed project is mainly located within the Beaufort West Local Municipality (BWLM) and Central Karoo District Municipality (CKDM) in the Western Cape Province. However, a portion of the project site and associated infrastructure extends into the Karoo Hoogland and Ubuntu Local Municipalities, located within the Namakwa and Pixley ka Seme District Municipalities of the Northern Cape Province.

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Question	**Response**
	The 2022-2027 BWLM Integrated Development Plan (IDP) (BWLM, 2025)[13] identified renewable energy as a key strategic economic sector. One of the Local Economic Development (LED) goals for the Karoo Hoogland Local Municipality (KHLM) is to assist with economic interventions in sector development, such as agricultural, tourism and renewable energy (KHLM, 2025)[14]. The proposed project is therefore well aligned with the BWLM and KHLM IDPs, as it is for renewable energy development, which will result in socio-economic benefits for the surrounding regions, and it will contribute to the national energy requirements. High unemployment, particularly youth unemployment, is a common challenge amongst all of the aforementioned municipalities. The development of the proposed WEF will therefore contribute to the municipalities' vision of creating employment opportunities and for supporting sustainable economic growth through increased investment and employment opportunities. Refer to Chapter 3 of this EIA Report for a detailed socio-economic profile of the various local and district municipalities. The proposed WEF project will create job opportunities and economic spin offs during the construction and operational phases (if an EA is granted by the DFFE). It is estimated that approximately 250 to 350 employment opportunities will be created during the construction phase and approximately 35 to 45 employment opportunities will be created during the operational phase. It should, however, be noted that employment opportunities during the construction phase will be temporary, whilst employment opportunities during the operational phase will be long-term. 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

[13] Beaufort West Local Municipality (2025). Final 2025/2026 IDP Review: 5th Generation Integrated Development Plan [2022/2027 IDP]. [Online]. Available at: https://www.beaufortwestmun.co.za/resource-category/integrated-development-plan?category=451. [Accessed: August 2025].
[14] Karoo Hoogland Local Municipality (2025). Final 2025/2026 IDP Review: 5th Generation Integrated Development Plan (IDP) of the Karoo Hoogland Municipality [2022/2027 IDP]. [Online]. Available at: https://www.karoohoogland.gov.za/wp-content/uploads/2025/04/IDP-2022-2027-NC066-To-Council-Draft-31-March-2025.pdf. [Accessed: August 2025].

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Question	**Response**
	proposed project will therefore be supportive of the affected municipalities' objective of facilitating job creation to address the high unemployment rates.
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.)	The land within the study area is currently being used for low density grazing. There are croplands in the study area, which have been avoided by the layout. Homesteads, livestock pens, windpumps, waterpoints, gravel farm roads, and fences are located within the study area. Furthermore, existing overhead powerlines run through the study area. An HIA was undertaken during the EIA Phase to assess potential archaeological and cultural impacts resulting from the proposed project. Refer to the HIA included in Appendix G.6 of this EIA Report for information on the impacts identified on Archaeology and Cultural Heritage as well as Appendix G.7 of this EIA Report for feedback on palaeontology. The HIA and PIA findings are also discussed in Chapters 3, 6 and 7 of this EIA Report. Should the proposed project proceed, it is not expected that the agricultural activities present on site will be significantly threatened. The Agricultural Compliance Statement Appendix (Appendix G.1 of this EIA Report) considers the impact of the proposed project in terms of the land capability and agricultural potential. The Compliance Statement states that since the proposed project will not occupy scarce, viable cropland and that the project's negative impact is offset by economic and other benefits to farming, the overall negative agricultural impact of the development (loss of future agricultural production potential) is assessed as being of low significance and as acceptable. As noted, EMPrs (Appendix H of this EIA Report) have been compiled for the proposed project to ensure that all potential negative impacts identified are suitably managed and mitigated, and potential positive impacts are enhanced.

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Question	**Response**
	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 WEF and its associated infrastructure in a rural landscape. The visual impact and considerations were assessed as part of the VIA undertaken during the EIA Phase. The VIA has provided more accurate mapping of landscape features at the detailed project scale, being a refinement of the Screening Tool Landscape Sensitivity Map. No significant landscape or scenic features would be affected by the proposed project. No fatal flaws have been identified from a sense of place perspective. Recommended mitigation measures have been included in the EMPrs, as required and where relevant. The combined environmental feature map and the combined environmental sensitivity map (inclusive of no-go areas) are included in Chapter 6 and Appendix C of this EIA Report. The sensitivities identified by the various specialists have been taken into consideration and avoided where possible in order to identify the Buildable Areas.
2.1.4. Municipal Economic Development Strategy ("LED Strategy").	Note that one of the thrusts in the National LED Strategy is focused on renewable energy development and enhancing efficiency in the energy sector. According to the CKDM Revised LED Strategy (2025)[15], wind power generation is listed as a strategic opportunity in the CKDM in terms of regional economic development. In the 2022-2027 BWLM IDP, LED is listed as Key Performance Area 2, and it is linked to the strategic objective of promoting broad-based growth and development (BWLM, 2025). The 2022-2027 BWLM IDP notes that it is of critical importance that the BWLM prioritises and leverages the REIPPPP as a critical LED driver in the municipality (BWLM, 2025). As South Africa works towards meeting its 2030 renewable energy targets, there is an increasing need for local value creation to ensure the sector contributes to the country's infrastructural needs; economic objectives, including the establishment of a local manufacturing base; and Just Transition objectives, including job creation in transition areas, which presents a significant opportunity for the BWLM (BWLM, 2025).

[15] Central Karoo District Municipality (2025). Revised LED Strategy Central Karoo District Municipality. [Online]. Available at: https://www.skdm.co.za/resource-category/local-economic-development [Accessed: October 2025].

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Question	**Response**
	In the 2022-2027 KHLM IDP, LED is listed as Key Performance Area 2, and it is linked to the strategic objective of creating economic centres that providing an enabling environment for business growth, job creation and Small Medium and Micro Enterprise (SMME) opportunities (KHLM, 2025). In the 2022-2027 Ubuntu Local Municipality (ULM) IDP, LED is listed as Key Performance Area 2, and it is linked to the strategic objective of investment acceleration and attraction (ULM, 2023)[16]. The proposed project aims to harness the wind resources available in the area for the generation of electricity, reducing the dependence on non-renewable sources such a coal. The proposed project will create job opportunities and economic spin offs during the construction and operational phases (should EA be granted). 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 supportive of the affected municipalities' overall strategic objective of facilitating job creation and promoting economic growth and development through increased investment and employment opportunities.
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? 2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	This has been addressed in the SIA (Appendix G.6 of this EIA Report). The assessment considers the impact of the proposed project from a socio-economic perspective. A socio-economic profile is also included in Chapter 3 of this EIA Report. The REIPPPP has contributed significantly towards meeting South Africa's Greenhouse Gas emission targets and, at the same time, supporting energy security, economic stability, and environmental sustainability. The establishment of renewable energy facilities, such as the proposed project, therefore, not only address the environmental issues associated with climate change and consumption of scarce water resources, but also creates significant socio-economic opportunities and benefits, specifically for historically disadvantaged, rural communities. The proposed development could be bid

[16] Ubuntu Local Municipality (2023). 2023/2024 Final IDP Document [2022/2027 IDP]. [Online]. Available at: https://ubuntu.gov.za/index.php/documents/category/135-ubuntu-idp-2023-2024 [Accessed: September 2025].

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Question	**Response**
	into the REIPPPP, or for any other available off-take programme (both of which would require socio-economic contributions).
2.3. How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	These needs and interests of the relevant communities have been addressed in the SIA included in Appendix G.8 of this EIA Report. Issues raised by Interested and Affected Parties (I&APs) to this effect are addressed in the relevant specialist assessments (i.e. summary of issues raised during the Scoping Phase, and adequate responses). Multiple Comments and Responses Trails are also included in Appendix E of this EIA Report, which includes all comments raised during the Scoping Phase, as well as comments received between the submission of the Final Scoping Report for consideration and the release of the Draft EIA Report for a 30-day comment period. Comments raised during the EIA Phase will be addressed, where relevant, and comments raised during the 30-day review of the Draft EIA Report will be captured and responded to in Appendix E of the Final EIA Report.
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?	This has been addressed in the SIA undertaken during the EIA Phase. The assessment has considered the impact of the proposed project from a socio-economic perspective, and the proposed project is deemed acceptable and desirable from a socio-economic perspective. This proposed development would, at a broad scale, assist in addressing climate change through the provision of renewable energy, and help to achieve the just energy transition from coal. From a positive socio-economic perspective, future generations would benefit from cleaner electricity and less reliance on coal, while current generations could get access to electricity, which is a crucial factor in the current energy crisis. The negative impacts associated with the proposed project can be effectively mitigated (and with mitigations being maintained for the life of the project, as required) to acceptable levels whereby the sustainability of the systems within which the proposed development is placed would not be compromised. Also, the positive socio-economic impacts are anticipated to be long-term for the operational phase i.e., for the lifespan (20 to 25 years) of the proposed project.

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Question	**Response**
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. Approximately 250 to 350 employment opportunities will be created during the construction phase, and approximately 35 to 45 will be created during the operational phase of the proposed project. It should, however, be noted that employment opportunities during the construction phase will be temporary, whilst the employment opportunities during the operational phase will be long-term. Residential opportunities would not be created by the proposed development as it is not the goal of a renewable energy facility.
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 site is zoned for agricultural use. This proposed project is a renewable energy project. Nevertheless, traffic related impacts of the proposed project have been addressed in the Traffic Impact Assessment, which is included in Appendix G.9 of this EIA Report. The Traffic Impact Assessment also includes key mitigation measures to mitigate negative impacts which have also been incorporated into the EMPrs (Appendix H of this EIA Report). A Traffic Management Plan has also been compiled and is included in the Traffic Impact Assessment.
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. This proposed project is a renewable energy project.
2.5.4. compliment other uses in the area	The land within the study area is currently being used for low density grazing. There are croplands in the study area, which have been avoided by the layout. The Agricultural Compliance Statement (Appendix G.1 of this EIA Report) provides feedback on the potential impact of the proposed project on agriculture. The proposed project will have wider societal benefits of generating additional income and employment in the local economy. The compliance statement explains that at the farm level, the proposed development will provide a positive economic impact. This is likely to increase financial security and may improve farming operations and productivity on other parts of the farm

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Question	**Response**
	or properties owned by the same farmer, through increased investment into farming. It will also potentially improve farm security. Based on the above, the proposed project is understood to compliment other uses in the area.
2.5.5. be in line with the planning for the area	As previously noted, the majority of the project infrastructure is located within the Central Karoo District Municipality (CKDM). The CKDM Spatial Development Framework (SDF)[17] has identified considerable opportunities for expanding renewable energy projects specifically related to solar and wind power generation in the CKDM, which encourages IPPs to locate in the region and to create downstream business- and employment opportunities. The development of the proposed WEF will therefore contribute to the municipality's vision of creating employment opportunities and for supporting sustainable economic growth.
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	The site is located within a well-established existing road network. Therefore, the need for development in undisturbed areas would be limited or avoided where possible as there are several existing roads on and within the vicinity of the proposed development area. Existing farm roads will be used for internal access as far as possible The connection of the cluster of the Genesis WEFs and SEFs to the national grid is the subject of separate Applications for EA. Refer to Chapter 2 of this EIA Report for details of the grid connection for the Genesis Southern, Middle, and Northern Clusters.
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)	The proposed project is a renewable energy project and is not related to bulk infrastructure expansion.
2.5.9. discourage "urban sprawl" and contribute to compaction/densification	This has been addressed in the SIA undertaken during the EIA Phase (Appendix G.8 of this EIA Report). The assessment considers impacts such as those associated with the

[17] Central Karoo District Municipal Spatial Development Framework (SDF). 2020. Available: https://www.skdm.co.za/resource-category/spatial-development-framework [online]. Accessed September 2025.

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Question	**Response**
	presence of construction workers on local communities; and the impacts related to the potential influx of job seekers (i.e. social disruption and change in social dynamics).
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	This is not applicable as the proposed project is located within a remote rural area, and the site is zoned for agricultural use.
2.5.11. encourage environmentally sustainable land development practices and processes	The development of a renewable energy facility is a sustainable land development practice provided it is constructed and operated in an environmentally conscious manner.
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.)	Refer to Chapter 5 of this EIA Report for a description of the process undertaken to identify the study area as the preferred site for the proposed WEF development. The TIA (Appendix G.9 of this EIA Report) also notes that delivery of components from the required port/s would be possible.
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)	The proposed development will result in increased job creation, and therefore also capital injection into the local community such as increased local household income and potential increases in LED. The SIA discusses the positive socio-economic impacts that will result from developing this project and the need for these benefits in the context of the local and regional municipalities, particularly regarding the lack of employment opportunities as well as the need for electricity as a whole and renewable energy (to shift reliance away from coal).
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	An HIA (Appendix G.6 of this EIA Report) and a PIA (Appendix G.7 of this EIA Report) have been undertaken to assess potential archaeological and cultural impacts, as well as potential palaeontological impacts resulting from the proposed project. The visual impact and considerations, including sense of place, have been further assessed as part of the VIA undertaken during the EIA Phase (Appendix G.5 of this EIA Report).
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?	Chapter 6 of this EIA Report includes a list of other renewable energy and electricity grid infrastructure (EGI) projects within a 30 km radius that have received EA or are currently going through an Environmental Assessment process. Although the proposed project site is not located within any of the gazetted REDZs, it is still in close proximity to the Beaufort West REDZ and will therefore significantly contribute to introducing renewable energy development into an area with optimal wind resource and a significant need for socio-economic growth.

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Question	**Response**
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)?	The approach adopted for this study was to assume the worst-case scenario will occur and then identify ways to mitigate or manage these impacts. In addition, the specialist assessments have provided detailed feedback on applicable uncertainties, assumptions, and risks associated with limits of current knowledge. These are captured in Appendix G of this EIA Report. The SIA (Appendix G.8 of this EIA Report) provides input on the assumptions and limitations considered in the assessment of socio-economic impacts.
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?	
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?	
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?	A detailed SIA has been undertaken (Appendix G.8 of this EIA Report), and it considers the impact of the proposed projects from a socio-economic perspective. A socio-economic profile is included in Chapter 3 of this EIA Report. In addition, measures to avoid, remedy, mitigate or manage negative socio-economic impacts and enhance positive socio-economic impacts have been included in the EMPrs.
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.)?	Linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area, as well as how the potential socio-economic impacts will result in ecological impacts are considered as part of the relevant specialist assessments.
2.9. What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	With regards to the best practicable environmental option, Chapter 5 of this EIA Report includes a description of alternatives. The proposed project has significant socio-economic benefits at the local and regional scale which outweigh the potential negative socio-economic impacts. Therefore, essentially the proposed development would result in greater socio-economic benefit than the status quo on site.
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,	

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Question	**Response**
allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	
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?	
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?	
2.13. What measures were taken to:	
2.13.1. ensure the participation of all interested and affected parties	The supporting documentation of the Public Participation Process (PPP) that was undertaken during the Scoping Phase is included as Appendix E of this EIA Report, and the PPP that is being undertaken during the EIA Phase is described in Chapter 4 of this EIA Report, with supporting documentation also provided in Appendix E. The PPP will comply with the 2014 NEMA EIA Regulations (as amended). Various methods are being employed to notify potential and registered I&APs of the proposed project, namely, through newspaper advertisements, site notices boards, notification letters and communication via email, as well as text messages, and telephonic discussions, where possible.
2.13.2. provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation	
2.13.3. ensure participation by vulnerable and disadvantaged persons	
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 S&EIA Process aims to take cognisance of all interests, needs, and values espoused by all I&APs. Opportunity for public participation will be provided to all potential and registered I&APs throughout the S&EIA Process in terms of the 2014 NEMA EIA Regulations (as amended), with additional steps being taken beyond the minimum legislative requirements.
2.13.5. ensure openness and transparency, and access to information in terms of the process	The supporting documentation of the PPP undertaken during the Scoping and EIA Phases are included in Appendix E of this EIA Report, and the PPP that is being undertaken during the EIA Phase is described in Chapter 4 of this EIA Report. Refer to the responses provided to Questions 2.13.1 – 2.13.3 above.
2.13.6. ensure that the interests, needs and values of all interested and affected parties were taken into account and that adequate	The EIA process takes cognisance of relevant interests, needs and values adopted by I&APs. Issues raised by I&APs to-date have been addressed in this report.

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Question	**Response**
recognition were given to all forms of knowledge, including traditional and ordinary knowledge	
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 will be promoted and opportunities for engagement will be provided during the EIA 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)?	This is addressed in the Socio-Economic Impact Assessment that is included Appendix G.8 of this EIA Report.
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?	EMPrs were developed in the EIA Phase to address environmental, health and safety concerns. An Environmental Control Officer (ECO) will be appointed to monitor compliance with the EMPrs and EA (should such authorisation be granted) during the construction and operational phases.
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	This is addressed in the Socio-Economic Impact Assessment that is included Appendix G.8 of this EIA Report.
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 jobs, but impact on 1000 agricultural jobs, etc.).	
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	Various government departments have been listed as I&APs and were given the opportunity to comment on the Draft Scoping Report and will be given the opportunity to comment on the Draft EIA Report during the 30-day public participation period. Refer to

NEED	
Question	**Response**
	Appendix E of this EIA Report for copies of comments received to date, as well as Comments and Responses Trails.
2.17.2. that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	No conflicts of interests between organs of state have been identified at this stage.
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 project will adhere to the principles of environmental management in NEMA. Measures taken to ensure adherence to the principles of NEMA are essentially addressed through the management actions and monitoring recommendations included in the EMPrs (Appendix H of this EIA Report). In addition, the outcomes of this Scoping and EIA Process and the associated conditions of the EA (should it be granted) will serve to address this question.
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 EMPrs were informed by the specialist assessments. This includes a detailed assessment of the environment as well as the impacts associated with the proposed project. Detailed specialist assessments have all concluded that the project can proceed, with no fatal flaws or unacceptable impacts identified as part of the proposed project. Therefore, the mitigation measures are deemed to be realistic and practical. The EMPrs are included in Appendix H of this EIA Report.
2.20. What measures were taken to ensure that the 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 EMPrs for the proposed project (included in Appendix H of this EIA Report) will form part of the contractual agreement and must be adhered to by the contractors, construction workers and the Project Applicant. The EMPrs include measures to ensure that the costs to potentially remedy pollution, environmental degradation and consequent adverse health effects will be paid for by those responsible for the relevant environmental impacts. The EMPrs accordingly include measures to ensure that the costs to potentially prevent, control or minimise further pollution, environmental damage or adverse health effects will be paid for by those responsible for the relevant environmental impacts. Roles and responsibilities for the implementation of management actions and monitoring thereof are included in the EMPrs.
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?	Renewable energy development is a suitable land use option for the site. The proposed project would be robust in terms of economic viability and profitability while also being largely uninfluenced by climate change variables. The proposed project 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 and other socio-economic benefits.

NEED	
Question	**Response**
	Chapter 5 of this EIA Report includes a full description of alternatives that have been assessed during the S&EIA Process.
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?	The potential cumulative impacts resulting from the proposed projects can only be objectively determined at the end of the EIA Process. These have been assessed during the EIA Phase. Chapter 6 of this EIA Report contains a list of all other renewable energy and projects within a 30 km radius that were considered in the cumulative impact assessment. Note that the Visual, Bats, and Avifaunal Assessments considered a 50 km radius. The Socio-Economic Specialist Assessment (Appendix G.8 of this EIA Report) identified the following cumulative impacts: ▪ Stimulation of Economic and Employment Growth during construction: the overall impact is considered to be of moderate (positive) significance. ▪ Increased Community Prosperity through Contributions and Income from IPPs during operation: the overall impact is considered to be of moderate (positive) significance.

1.12 Objectives and Structure of this EIA Report

This EIA Report was preceded by a comprehensive Scoping Process. During the Scoping Phase, the Scoping Report was made available to I&APs and stakeholders for a 30-day comment period, which extended from 4 September 2023 to 6 October 2023 (excluding public holidays). Issues raised in response to the Draft Scoping Report were captured in an Issues/Comments and Responses Trail. The Final Scoping Report was submitted to the DFFE in October 2023 for consideration in line with Regulation 21 (1) of GN R326. The DFFE accepted the Final Scoping Report and Plan of Study for EIA on 27 November 2023. Refer to Appendix E.4 of this EIA Report for a copy of this acceptance letter. This acceptance marked the end of the Scoping Phase after which the EIA Process moved into the impact assessment and reporting phase.

For the purpose of completeness and continuity, the documentation associated with the Public Participation Process undertaken in the Scoping Phase, and comments received from I&APs during the Scoping Phase, as well as the Issues/Comments and Responses Trail for the comments received during the review of the Draft Scoping Report are included in Appendix E.1 to E.3 of this EIA Report. For background on the Scoping Process, the reader is referred to the Final Scoping Report (CSIR, 2023).

The EIA Phase of this Scoping and EIA Process is shaped by the findings of the Scoping Phase. The 2014 NEMA EIA Regulations (as amended) stipulates that the EIA Process must be undertaken in line with the approved Plan of Study for the EIA[18], and that it must include a description of the potential environmental impacts, mitigation, and closure outcomes, as well as the residual risks of the proposed activity. In broad terms, the objectives of the EIA Process in terms of the 2014 NEMA EIA Regulations (as amended) are to:

- *"determine the policy and legislative context within which the activity is located and note how the proposed activity complies with and responds to the policy and legislative context;*
- *describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;*
- *identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;*
- *determine the nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and the degree to which these impacts (a) can be reversed; (b) may cause irreplaceable loss of resources, and (c) can be avoided, managed or mitigated;*
- *identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;*
- *identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;*

[18] The Plan of Study for the EIA was detailed in Chapter 7 of the Final Scoping Report, which was accepted by the DFFE in November 2023.

- *identify suitable measures to avoid, manage or mitigate identified impacts; and*
- *identify residual risks that need to be managed and monitored".*

In terms of legal requirements, a crucial objective of the EIA Report is to satisfy the requirements of Appendix 3 of the 2014 NEMA EIA Regulations (as amended). This section regulates and prescribes the content of the EIA Report and specifies the type of supporting information that must accompany the submission of the EIA Report to the Competent Authority. An overview of where the requirements of Appendix 3 of the 2014 NEMA EIA Regulations (as amended) are addressed in this EIA Report is presented in Table 1.5 below.

Furthermore, this process is designed to satisfy the requirements of Regulations 41, 42, 43 and 44 of the 2014 NEMA EIA Regulations (as amended) relating to the PPP and, specifically, the registration of and submissions from potential and registered I&APs.

This EIA Report is currently being made available to registered I&APs, Organs of State and key relevant stakeholders for a 30-day comment period. All comments received during the 30-day comment period on the Draft EIA Report will be incorporated into the Comments and Responses Report and addressed, as applicable and where relevant, and will be included with the Final EIA Report that will be submitted to the DFFE for decision-making (i.e. approval or refusal) in line with Regulation 24 of GN R326.

This EIA Report is structured as follows:

Part A

- Executive Summary
- Chapter 1: Introduction
- Chapter 2: Project Description
- Chapter 3: Description of the Affected Environment
- Chapter 4: Approach to EIA Process and Public Participation
- Chapter 5: Alternatives
- Chapter 6: Impact Assessment and Sensitivity Analysis
- Chapter 7: Conclusions and Recommendations

Part B (Supporting Documentation):

- Appendix A: Curriculum Vitae of the EAP and Project Team;
- Appendix B: Declaration of Independence of the EAP;
- Appendix C: Maps;
- Appendix D: Database of I&APs;
- Appendix E: Public Participation and Comments and Responses Reports;
- Appendix F: Pre-Application Consultation with the Competent Authority;
- Appendix G: Specialist Studies and Inputs;
- Appendix H: EMPrs; and
- Appendix I: Additional Information.

As required in Regulation 23 (4) of the 2014 NEMA EIA Regulations (as amended), the EMPrs that are required as part of the EIA Process are provided in Appendix H of this EIA Report. The EMPr for the WEF and associated infrastructure (Appendix H.1 of this EIA Report) has been structured to comply with the requirements outlined in Appendix 4 of the 2014 NEMA EIA Regulations (as amended). The EMPr for the WEF IPP Substation (Appendix H.2 of this EIA Report) complies with the Generic EMPr for substations published in GN 435 in March 2019. The EMPr for the 132 kV power line (Appendix H.3 of this EIA Report) complies with the Generic EMPr for power lines published in GN 435 in March 2019.

Table 1.5: Compliance with Appendix 3 of the 2014 NEMA EIA Regulations (as amended)

Section of the EIA Regulations	Requirements for an Environmental Impact Assessment Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326)	Chapter / Appendix
Appendix 3 - (3) (1) (a)	Details of - i. the EAP who prepared the report; and ii. the expertise of the EAP, including a curriculum vitae;	Chapter 1, Appendix A and Appendix B
Appendix 3 - (3) (1) (b)	The location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including - i. the 21-digit Surveyor General code of each cadastral land parcel; ii. where available, the physical address and farm name; iii. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Chapter 2, Chapter 3, Chapter 7, Appendix C
Appendix 3 - (3) (1) (c)	A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is - i. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Chapter 2, Chapter 3, Chapter 7, Appendix C
Appendix 3 - (3) (1) (d)	A description of the scope of the proposed activity, including – i. all listed and specified activities triggered and being applied for; ii. a description of the associated structures and infrastructure related to the development;	Chapter 2 and Chapter 4
Appendix 3 - (3) (1) (e)	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Chapter 4 and Appendix G
Appendix 3 - (3) (1) (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 development footprint within the approved site as contemplated in the accepted scoping report;	Chapter 1 and Chapter 5
Appendix 3 – (3) (1) (g)	A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Chapter 5
Appendix 3 – (3) (1) (h)	A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including - i. details of all the alternatives considered; ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; 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; iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; v. the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts (aa) can be reversed; (bb) may cause	Chapter 4, Chapter 5, Appendix E

Section of the EIA Regulations	Requirements for an Environmental Impact Assessment Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326)	Chapter / Appendix
	irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; vi. the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks; 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; viii. the possible mitigation measures that could be applied and level of residual risk; ix. if no alternative development footprints for the activity were investigated, the motivation for not considering such; and x. a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report;	
Appendix 3 - (3) (1) (i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report 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 i. 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;	Chapter 6 and Appendix G
Appendix 3 – (3) (1) (j)	An assessment of each identified potentially significant impact and risk, including (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be mitigated;	Chapter 6 and Appendix G
Appendix 3 – (3) (1) (k)	Where applicable, a summary of the findings and recommendations of 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 assessment report;	Chapter 6, Chapter 7, Appendix G
Appendix 3 – (3) (1) (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 development footprint on the approved site as contemplated in the accepted scoping report 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;	Chapter 6, Chapter 7, Appendix E, Appendix H
Appendix 3 – (3) (1) (m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;	Chapter 6, Chapter 7, Appendix G, Appendix H
Appendix 3 – (3) (1) (n)	The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Chapters 5, Chapter 7, Appendix G, Appendix H
Appendix 3 – (3) (1) (o)	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;	Chapter 6, Chapter 7, Appendix G
Appendix 3 – (3) (1) (p)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Chapter 6, Chapter 7, Appendix G

Section of the EIA Regulations	Requirements for an Environmental Impact Assessment Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326)	Chapter / Appendix
Appendix 3 – (3) (1) (q)	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;	Chapter 7
Appendix 3 – (3) (1) (r)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	Not Applicable
Appendix 3 - (3) (1) (s)	An undertaking under oath or affirmation by the EAP in relation to - ii. the correctness of the information provided in the reports; iii. the inclusion of comments and inputs from stakeholders and interested and affected parties; iv. the inclusion of inputs and recommendations from the specialist reports where relevant; and v. any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Appendix B
Appendix 3 – (3) (1) (u)	An indication of any deviation from the approved scoping report, including the plan of study, including - i. any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and ii. a motivation for the deviation;	Not applicable
Appendix 3 - (3) (1) (v)	Any specific information that may be required by the competent authority; and	Information requested by the DFFE during comment periods, and acceptance of the Final Scoping Report have been addressed throughout the report, as relevant
Appendix 3 - (3) (1) (w)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	Throughout the report
Appendix 3 - (3) (2)	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to an environmental impact assessment report the requirements as indicated in such notice will apply.	Not applicable in terms of the actual EIA Report, but various gazetted assessment and reporting protocols have been complied with for relevant specialist assessments. Refer to Chapter 4, Chapter 6. Chapter 7, and Appendix G of this EIA Report.

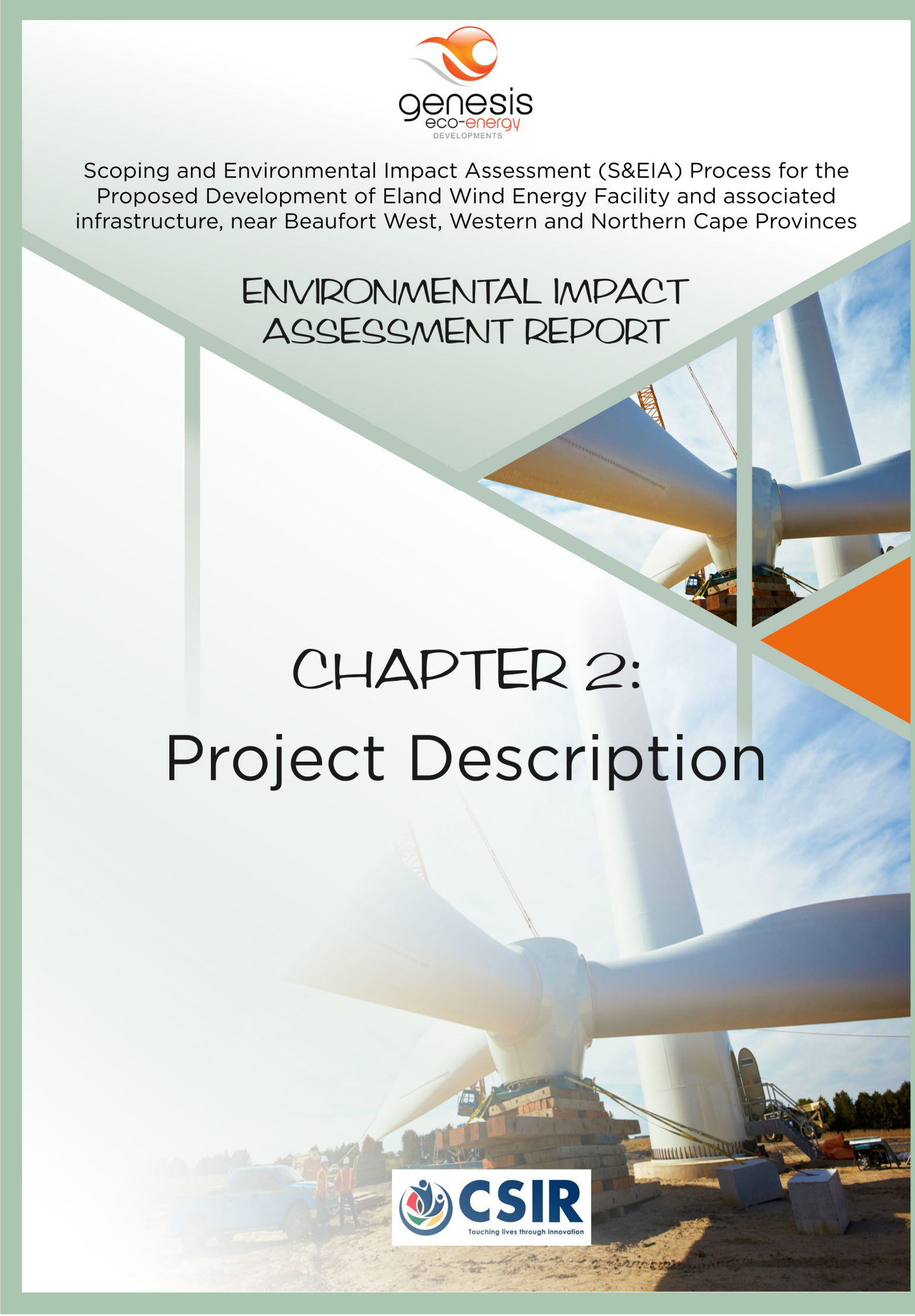
genesis eco-energy DEVELOPMENTS

Scoping and Environmental Impact Assessment (S&EIA) Process for the Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 2:

Project Description



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2. PROJECT DESCRIPTION

This chapter provides an overview of the conceptual project design and technology for the proposed Eland Wind Energy Facility (WEF) and associated infrastructure, as provided by the Genesis Eco-Energy Developments (Pty) Ltd (hereafter referred to as "GEED" or the "Project Developer").

The purpose of this chapter is to present sufficient project information on the proposed project to inform the Scoping and Environmental Impact Assessment (EIA) Process in terms of design parameters applicable to the project.

2.1 Definition of Project Study Area

The **study area or preferred site** for the proposed Eland WEF and associated infrastructure is the **full extent** of the **affected farm properties** on which the proposed project and associated infrastructure is planned to be constructed. The study area for the proposed 132 kV overhead power line is a 300 m wide assessment corridor, which covers an area of approximately 166 ha. The properties forming part of the study area are listed in Table 2.1. The full extent of Elands Fontein Farm RE/24 (i.e. 2 229 ha) and Drooge Onrust Farm RE/22 (i.e. 2 961 ha), as well as the full extent of the EGI assessment corridor (i.e. 166 ha) have been assessed by the specialists to identify environmental sensitivities and no-go areas. The preferred site serves as the study area for this Scoping and EIA Process. Therefore, the terms "site" and "study area" are used synonymously in this Report.

Table 2.1: Farm Properties forming the study area

FARM PORTION	21-DIGIT SURVEYOR GENERAL CODE	AREA (ha)
WEF, SUBSTATION COMPLEX, AND INTERNAL ROADS		
Elands Fontein Farm RE/24	C00900000000002400000	2 229
EGI CORRIDOR		
Elands Fontein Farm RE/24	C00900000000002400000	166
Drooge Onrust Farm RE/22	C00900000000002200000	

At the commencement of this Scoping and EIA Process, the **Original Scoping Buildable Area** which falls within the study area / preferred site, was identified by the Project Applicant following the completion of high-level environmental screening based on the Screening Tool.

As part of the Scoping Phase, the specialists assessed and considered the entire study area / preferred site, which includes the **Original Scoping Buildable Area**.

Based on the initial findings of the specialist assessments, a preliminary combined environmental sensitivity map was prepared. This map showed the environmental sensitivities (*inter alia* avifauna, bats, terrestrial biodiversity, watercourses, heritage features, etc.) within the larger study area that was assessed during the Scoping Phase.

Following the identification of sensitivities by the specialists and relevant specialist fieldwork during the Scoping Phase, the Project Developer took such sensitivities, and other considerations, into account and formulated the **Revised Scoping Buildable Area**. The Revised Scoping Buildable Area was used to inform the design of the layout and development footprint of the proposed project, which avoids (where possible) the most sensitive features that were identified by the specialists within the assessed study area. The preliminary layout proposed at the Scoping Phase was further refined and detailed during the EIA Phase and assessed by the specialists. The layout maps presented at the EIA Phase are final and deemed acceptable by the specialists.

The total physical development footprint of the proposed WEF (i.e., maximum 27 turbines and supporting infrastructure [excluding the power line]) is estimated to comprise approximately 124 ha. Therefore, the permanent development footprint of approximately 124 ha equates to roughly 6% of the total assessed study area.

Figure 2.1 provides an indication of the affected farm portions and the adjacent farm portions for the entire study area.

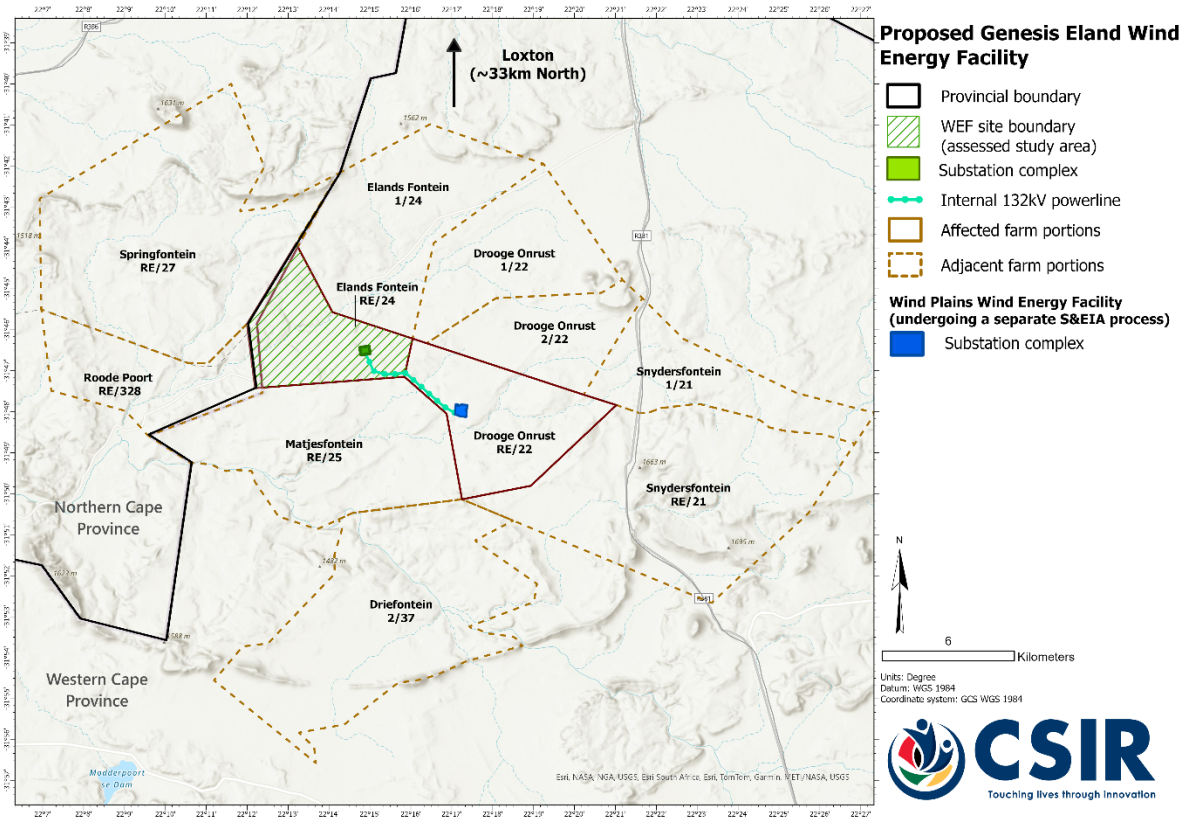


Figure 2.1: Affected and Adjacent Farm Portions for the study area.

2.2 Project Locality and Co-ordinates

Appendix 3 of the 2014 National Environmental Management Act, 1998 (Act 107 of 1998, as amended) (NEMA) EIA Regulations (as amended) states that an EIA Report must provide the location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including the 21-digit Surveyor General code of each cadastral land parcel; where available, the physical address and farm name; or the coordinates of the boundary of the property or properties if the aforementioned is not available. Appendix 3 of the 2014 NEMA EIA Regulations (as amended) also states that an EIA Report must include a plan which locates the proposed activity or activities applied for at an appropriate scale or, if it is a linear activity, then a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken.

In line with the above, refer to Chapter 1 for a locality map of the proposed Eland WEF and associated infrastructure. Refer to Appendix C of this Report for additional maps, including final layout maps, feature maps for the study area, sensitivity maps for the study area and projects, and final combined layout and sensitivity maps.

The proposed project and associated infrastructure will occur on the farm portion listed in Table 2.1 above, which also specifies the corresponding 21-digit Surveyor General code for each affected farm portion.

The approximate co-ordinates of the mid-point and corner points of the proposed WEF, wind turbine positions and corresponding numbers, associated infrastructure, and stormwater crossings, as well as the start, middle, and end point coordinates of the 132 kV overhead power line, access road and internal access roads are provided in Table 2.2. Maps corresponding to the aforementioned co-ordinate points are provided in Figure 2.2 to Figure 2.4.

Table 2.2: Co-ordinates of the proposed WEF and associated infrastructure

Point	Decimal Degrees		Degrees, Minutes, Seconds	
	Latitude (Y)	Longitude (X)	Latitude (S)	Longitude (E)
Proposed WEF				
Mid-Point	-31.769542	22.228195	31° 46' 10.35224541" S	022° 13' 41.50043027" E
Corner Point: E-WEF-1	-31.77024489	22.26739542	31° 46' 12.88160760" S	022° 16' 02.62352640" E
Corner Point: E-WEF-2	-31.78575532	22.26404643	31° 47' 08.71915200" S	022° 15' 50.56714080" E
Corner Point: E-WEF-3	-31.79038294	22.20324719	31° 47' 25.37858400" S	022° 12' 11.68987680" E
Corner Point: E-WEF-4	-31.76428503	22.1999167	31° 45' 51.42612240" S	022° 11' 59.70013440" E
Corner Point: E-WEF-5	-31.73157118	22.21991247	31° 43' 53.65626240" S	022° 13' 11.68489560" E
Corner Point: E-WEF-6	-31.75951388	22.23477608	31° 45' 34.24998600" S	022° 14' 05.19389520" E
Wind Turbine Positions				
Wind Turbine 1	-31.73635295	22.21879693	31° 44' 10.87061103" S	022° 13' 07.66893360" E
Wind Turbine 2	-31.74260644	22.21672529	31° 44' 33.38318558" S	022° 13' 00.21104040" E
Wind Turbine 3	-31.75349578	22.21132404	31° 45' 12.58481673" S	022° 12' 40.76654760" E
Wind Turbine 4	-31.76200631	22.20585014	31° 45' 43.22272470" S	022° 12' 21.06048960" E
Wind Turbine 5	-31.77208902	22.20147045	31° 46' 19.52048062" S	022° 12' 05.29362000" E
Wind Turbine 6	-31.74280688	22.22405417	31° 44' 34.10478382" S	022° 13' 26.59501560" E
Wind Turbine 7	-31.7512965	22.22586563	31° 45' 04.66741206" S	022° 13' 33.11627880" E
Wind Turbine 8	-31.75392903	22.21946005	31° 45' 14.14451699" S	022° 13' 10.05618360" E
Wind Turbine 9	-31.76221817	22.21299063	31° 45' 43.98542779" S	022° 12' 46.76626440" E

Point	Decimal Degrees		Degrees, Minutes, Seconds	
	Latitude (Y)	Longitude (X)	Latitude (S)	Longitude (E)
Wind Turbine 10	-31.76100953	22.22052429	31° 45' 39.63432407" S	022° 13' 13.88745840" E
Wind Turbine 11	-31.7601209	22.22850544	31° 45' 36.43524539" S	022° 13' 42.61957320" E
Wind Turbine 12	-31.76896107	22.2230477	31° 46' 08.25985743" S	022° 13' 22.97170920" E
Wind Turbine 13	-31.77506935	22.21862393	31° 46' 30.24964368" S	022° 13' 07.04613000" E
Wind Turbine 14	-31.7784087	22.21508358	31° 46' 42.27131435" S	022° 12' 54.30089160" E
Wind Turbine 15	-31.76455388	22.23968878	31° 45' 52.39395846" S	022° 14' 22.87961880" E
Wind Turbine 16	-31.76988891	22.23898874	31° 46' 11.60006343" S	022° 14' 20.35944600" E
Wind Turbine 17	-31.77356211	22.23513618	31° 46' 24.82358659" S	022° 14' 06.49025160" E
Wind Turbine 18	-31.7757679	22.22914911	31° 46' 32.76442355" S	022° 13' 44.93681040" E
Wind Turbine 19	-31.78091644	22.23563183	31° 46' 51.29920032" S	022° 14' 08.27457360" E
Wind Turbine 20	-31.76493577	22.2485409	31° 45' 53.76878034" S	022° 14' 54.74724720" E
Wind Turbine 21	-31.76706449	22.25490293	31° 46' 01.43215851" S	022° 15' 17.65054440" E
Wind Turbine 22	-31.77203276	22.25269547	31° 46' 19.31795170" S	022° 15' 09.70367760" E
Wind Turbine 23	-31.77812295	22.25326483	31° 46' 41.24262884" S	022° 15' 11.75337000" E
Wind Turbine 24	-31.78049948	22.24617904	31° 46' 49.79812223" S	022° 14' 46.24454040" E
Wind Turbine 25	-31.78592256	22.2426602	31° 47' 09.32121020" S	022° 14' 33.57672000" E
Wind Turbine 26	-31.76962552	22.263013	31° 46' 10.65185579" S	022° 15' 46.84681080" E
Wind Turbine 27	-31.77594469	22.25924168	31° 46' 33.40088564" S	022° 15' 33.27005160" E
Stormwater Crossings				
Water Crossing 1	-31.75214571	22.22426764	31° 45' 07.72456320" S	022° 13' 27.36350760" E
Water Crossing 2	-31.75296206	22.21629843	31° 45' 10.66340880" S	022° 12' 58.67434080" E
Water Crossing 3	-31.75289892	22.21451151	31° 45' 10.43610840" S	022° 12' 52.24144320" E
Water Crossing 4	-31.7542755	22.20945615	31° 45' 15.39180000" S	022° 12' 34.04212200" E
Water Crossing 5	-31.75537105	22.20832061	31° 45' 19.33577280" S	022° 12' 29.95419240" E
Water Crossing 6	-31.75916322	22.20590677	31° 45' 32.98760280" S	022° 12' 21.26436840" E
Water Crossing 7	-31.76421846	22.2058142	31° 45' 51.18644160" S	022° 12' 20.93110200" E
Water Crossing 8	-31.76520875	22.20543344	31° 45' 54.75150360" S	022° 12' 19.56039840" E
Water Crossing 9	-31.76879969	22.2039038	31° 46' 07.67888040" S	022° 12' 14.05368360" E
Water Crossing 10	-31.76965644	22.20354735	31° 46' 10.76318400" S	022° 12' 12.77044200" E
Water Crossing 11	-31.76569893	22.2251558	31° 45' 56.51614440" S	022° 13' 30.56086920" E
Water Crossing 12	-31.76808453	22.24511331	31° 46' 05.10432240" S	022° 14' 42.40790520" E
Water Crossing 13	-31.76864721	22.2476697	31° 46' 07.12997400" S	022° 14' 51.61093440" E
Water Crossing 14	-31.76977896	22.24638416	31° 46' 11.20426320" S	022° 14' 46.98297240" E
Water Crossing 15	-31.77012214	22.25346934	31° 46' 12.43970760" S	022° 15' 12.48963480" E
Water Crossing 16	-31.77196245	22.26434545	31° 46' 19.06480920" S	022° 15' 51.64362720" E
Water Crossing 17	-31.77285444	22.26404943	31° 46' 22.27598760" S	022° 15' 50.57794440" E
Water Crossing 18	-31.77553164	22.26158144	31° 46' 31.91390400" S	022° 15' 41.69316960" E
Water Crossing 19	-31.77731939	22.24198274	31° 46' 38.34978960" S	022° 14' 31.13786400" E
Water Crossing 20	-31.77960117	22.24000047	31° 46' 46.56422280" S	022° 14' 24.00167400" E
Water Crossing 21	-31.78040843	22.23733535	31° 46' 49.47035160" S	022° 14' 14.40727440" E
Substation Complex				
Corner Point: E-1	-31.77380629	22.24587362	31° 46' 25.70262960" S	022° 14' 45.14503560" E
Corner Point: E-2	-31.77323214	22.24967241	31° 46' 23.63569320" S	022° 14' 58.82067240" E
Corner Point: E-3	-31.77635145	22.2501506	31° 46' 34.86522360" S	022° 15' 00.54214560" E
Corner Point: E-4	-31.77637125	22.25001959	31° 46' 34.93650720" S	022° 15' 00.07053840" E
Corner Point: E-5	-31.77631512	22.24959757	31° 46' 34.73445000" S	022° 14' 58.55126640" E
Corner Point: E-6	-31.77631597	22.24936989	31° 46' 34.73748480" S	022° 14' 57.73158600" E
Corner Point: E-7	-31.77662308	22.24835343	31° 46' 35.84310600" S	022° 14' 54.07233000" E
Corner Point: E-8	-31.77688599	22.24661402	31° 46' 36.78955320" S	022° 14' 47.81046840" E
Corner Point: E-9	-31.77684621	22.24647455	31° 46' 36.64636320" S	022° 14' 47.30836920" E
Corner Point: E-10	-31.77684218	22.24633901	31° 46' 36.63183720" S	022° 14' 46.82044320" E

Point	Decimal Degrees		Degrees, Minutes, Seconds	
	Latitude (Y)	Longitude (X)	Latitude (S)	Longitude (E)
On-Site Substation				
Corner Point: D-1	-31.77495454	22.24735706	31° 46' 29.83634400" S	022° 14' 50.48542680" E
Corner Point: D-2	-31.7747899	22.2483253	31° 46' 29.24365080" S	022° 14' 53.97109080" E
Corner Point: D-3	-31.77574629	22.2484844	31° 46' 32.68663320" S	022° 14' 54.54384360" E
Corner Point: D-4	-31.77591092	22.24751616	31° 46' 33.27931560" S	022° 14' 51.05818680" E
BESS				
Corner Point: C-1	-31.77667468	22.24760261	31° 46' 36.02885880" S	022° 14' 51.36938160" E
Corner Point: C-2	-31.77678622	22.24645265	31° 46' 36.43037760" S	022° 14' 47.22954360" E
Corner Point: C-3	-31.7745758	22.24601393	31° 46' 28.47288720" S	022° 14' 45.65014440" E
Corner Point: C-4	-31.77446428	22.24716389	31° 46' 28.07142240" S	022° 14' 49.79000040" E
O&M Buildings				
Corner Point: B-1	-31.7742596	22.24804637	31° 46' 27.33456360" S	022° 14' 52.96692480" E
Corner Point: B-2	-31.77473874	22.24812575	31° 46' 29.05944960" S	022° 14' 53.25268920" E
Corner Point: B-3	-31.77482031	22.24764248	31° 46' 29.35310160" S	022° 14' 51.51291720" E
Corner Point: B-4	-31.77434117	22.2475631	31° 46' 27.62821560" S	022° 14' 51.22714920" E
Laydown Area				
Corner Point: A-1	-31.77323214	22.24967241	31° 46' 23.63569320" S	022° 14' 58.82067240" E
Corner Point: A-2	-31.77614494	22.25011894	31° 46' 34.12179480" S	022° 15' 00.42818040" E
Corner Point: A-3	-31.77643679	22.2486775	31° 46' 35.17246200" S	022° 14' 55.23900000" E
Corner Point: A-4	-31.77350832	22.24818581	31° 46' 24.62997000" S	022° 14' 53.46890880" E
Eland WEF 132 kV Power Line				
Start Point	-31.77582419	22.24802622	31° 46' 32.96709480" S	022° 14' 52.89439560" E
Middle Point	-31.7870196	22.26771842	31° 47' 13.27057800" S	022° 16' 03.78630120" E
End Point	-31.79781744	22.2873778	31° 47' 52.14277680" S	022° 17' 14.56008360" E
Main Access Road (DR02315)				
Start Point	-31.761359	22.240207	31° 45' 40.89087360" S	022° 14' 24.74424600" E
Middle Point	-31.776631	22.223167	31° 46' 35.87212920" S	022° 13' 23.40100920" E
End Point	-31.787388	22.203476	31° 47' 14.59498560" S	022° 12' 12.51535320" E
Internal Access Roads				
Start Point	-31.736002	22.218732	31° 44' 09.60720000" S	022° 13' 07.43520000" E
Middle Point	-31.767802	22.235818	31° 46' 04.08720000" S	022° 14' 08.94480000" E
End Point	-31.771857	22.267045	31° 46' 18.68520000" S	022° 16' 01.36200000" E

**Note that the Main Access Road (DR02315) Start Point is the northern most point, whereas the Internal Access Roads Start Point is the northwestern most point as indicated in Figure 2.3 below.*

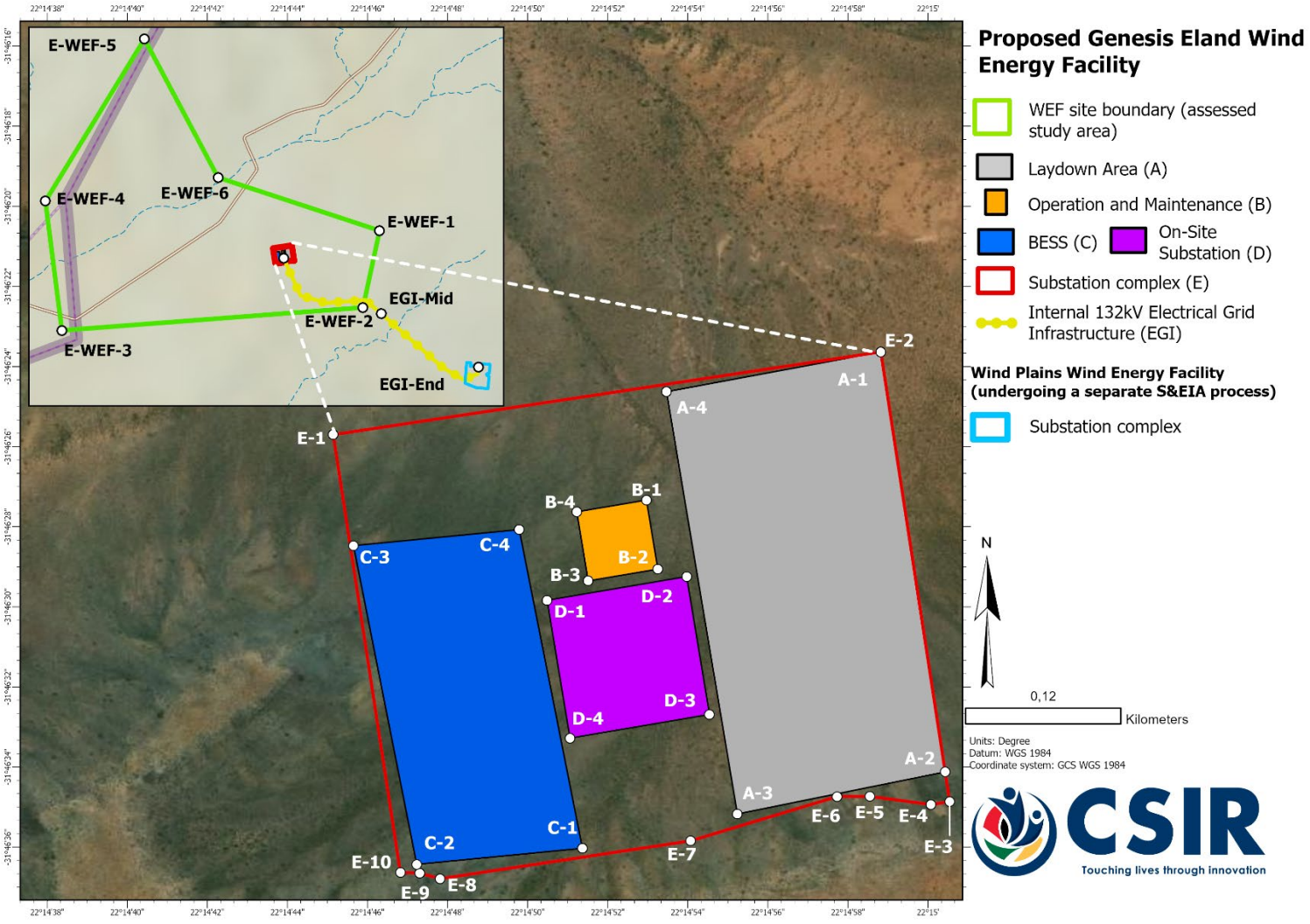


Figure 2.2: Coordinate points of the proposed WEF (i.e. the assessed study area) and its associated power line and substation complex.

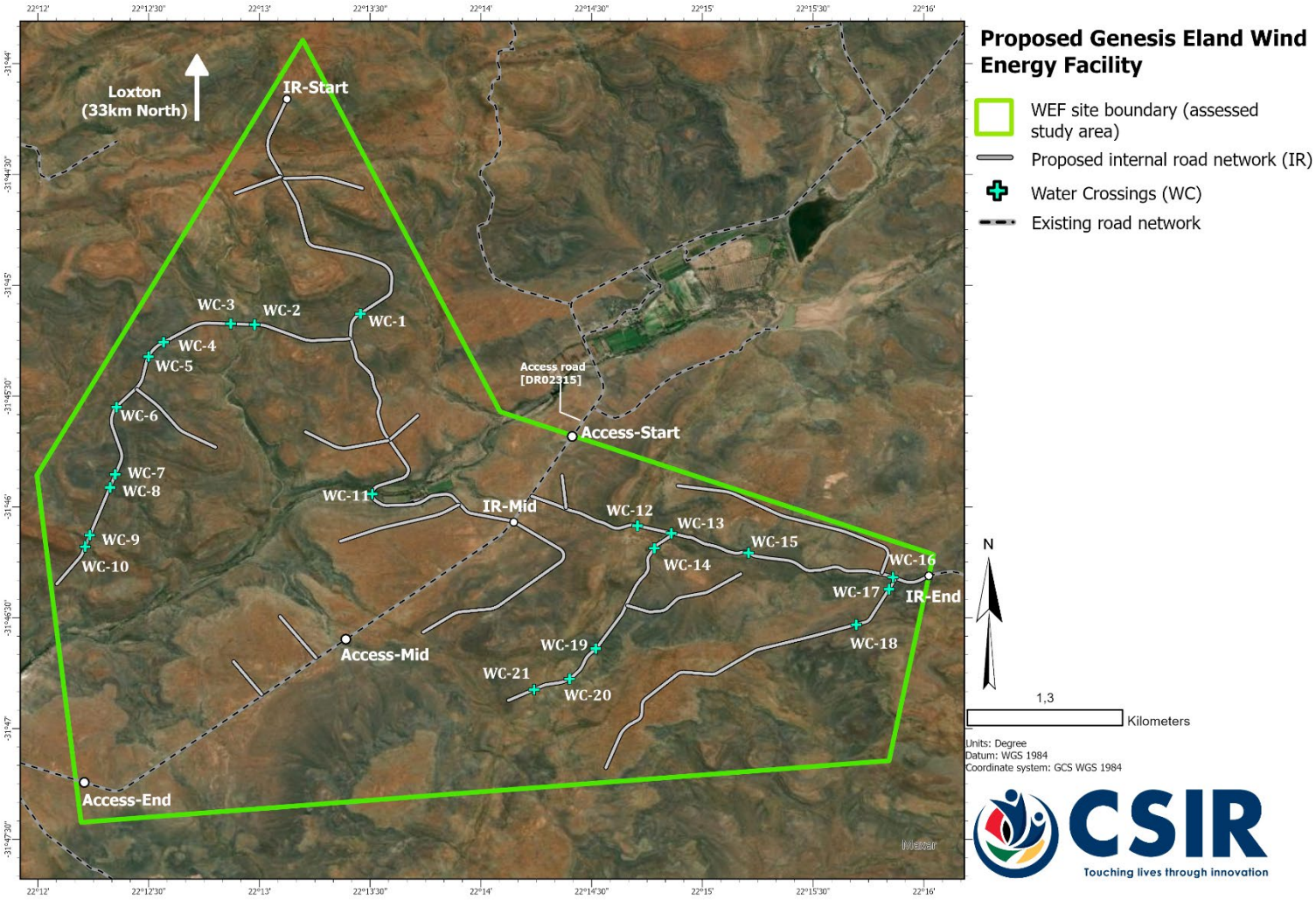


Figure 2.3: Coordinate points of the stormwater crossings, main access road (DR02315), and internal access roads for the proposed WEF.

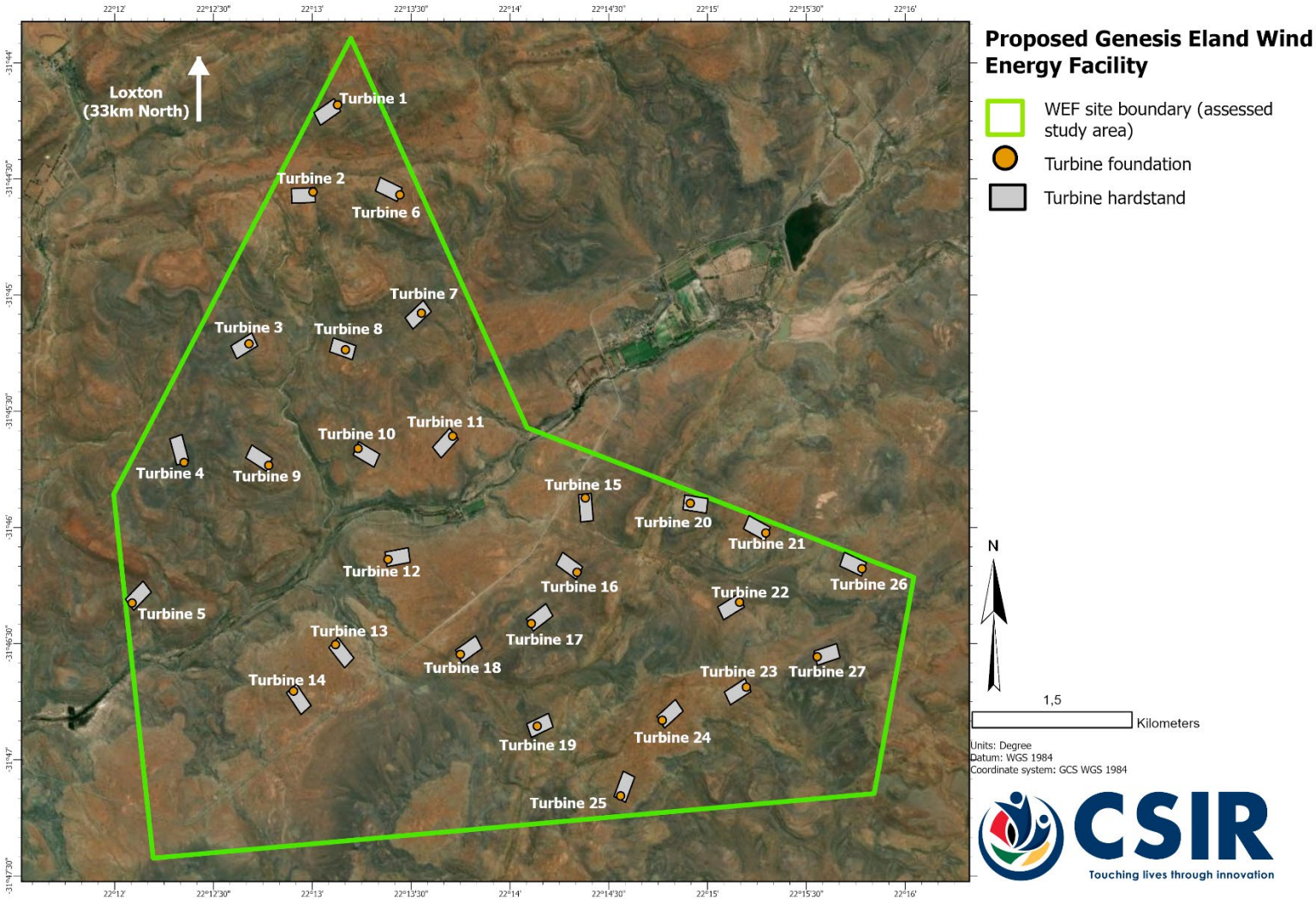


Figure 2.4: Coordinate points of the wind turbine positions for the proposed WEF.

2.3 Key components of the proposed project

A summary of the key components of the proposed project and technical information is described in this section.

The WEF will typically consist of some of the illustrated components shown in Figure 2.5 below.

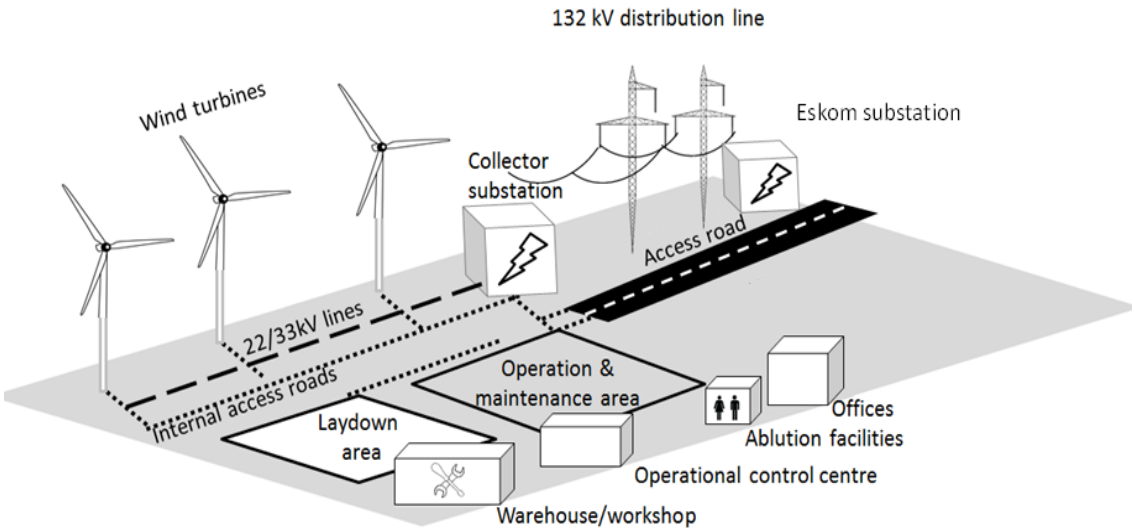


Figure 2.5: Typical components of a Wind Energy Facility (*Source*: Tennessee Valley Authority, Wikimedia)

The proposed project will consist of the key components listed below in Table 2.3.

Table 2.3: Description of the components of the proposed project[1]

COMPONENT	DESCRIPTION
Wind Turbines	
Type of Technology	▪ Onshore Wind Turbine Generators (WTGs)
Turbine Count	▪ Up to 27 WTGs
Capacity per WTG	▪ Up to 10 MW
Facility Generation Capacity	▪ Up to 270 MW
Hub height	▪ Up to 200 m
Tower	▪ Conical shaped either constructed of full steel, full concrete, or hybrid
Number of Blades per WTG	▪ 3
Length of blade	▪ Up to 100 m

[1] The proposed project specifications were amended from the Scoping Phase to the EIA Phase. The main updates to the project specifications include:

- Turbine Count changed from 21 WTGs in the Scoping Phase to up to 27 WTGs in the EIA Phase.
- Facility Generation Capacity changed from 210 MW in the Scoping Phase to up to 270 MW in the EIA Phase.

COMPONENT	DESCRIPTION
Rotor (Blade) diameter	▪ 200 m (up to 100 m blade / radius)
Rotor Top Tip Height	▪ Up to 300 m (maximum based on 200 m hub + 100 m blade length)
Foundation Diameter per WTG	▪ Up to 64 m
Foundation Area per WTG	▪ 0.32 ha
Hardstand / Laydown per WTG	▪ Up to 2.22 ha ▪ The length and width of the hardstand / laydown area changes per WTG depending on the soil and topographic properties, e.g., 206 m x 108 m or 190 m x 117 m etc.
Disturbed Area per WTG (Foundation + Hardstand)	▪ Up to 2.54 ha
Overhead Transmission Power Line (OHPL)	
Line capacity	▪ 132 kV
Line length	▪ Approximately 5 km
Pylon height	▪ 17.4 m – 31 m
Pylon type, span, working area and footprint	▪ Type: Monopole or steel lattice type pylons, or combination of both where required. ▪ Span: The pylons will have a span of 200 m to 350 m for monopole pylons and up to approximately 500 m for lattice structures. ▪ Working area: The working area required around a pylon position during the construction phase is approximately 30 m x 30 m (900 m^2). ▪ Footprint: The size of the final constructed pylon footprint depends on the type of structure used, which will typically range from approximately 0.5 m^2 to 8 m^2 for monopole pylons, and 36 m^2 to 173 m^2 for steel lattice pylons.
Tower type	▪ Self-supporting and Angle Strain towers
Registered servitude	▪ Up to 55 m wide (where multiple adjacent power lines occur), in line with the Eskom Distribution Guideline for OHPL. Note that the entire servitude will not be cleared of vegetation.
Assessment corridor	▪ Specialists assessed an approximately 300 m wide corridor (i.e., 150 m on either side of centreline) for the power line to identify sensitivities and features that need to be avoided.
Building Infrastructure and Substation	

Substation Complex	▪ Cumulative Footprint: ~13 ha in extent and includes:
	  ▪ 33/132kV on-site Substation (~1 ha)
	  ▪ BESS (~2.7 ha)
	  ▪ O&M Buildings (~0.25 ha)
	  ▪ Laydown area (~4.6 ha)

Auxiliary Buildings	▪ Type: These include, but are not limited to, O&M building / centre, site office, workshop, staff lockers, bathrooms / ablutions, warehouses, guard houses, etc. ▪ Cumulative Footprint: Approximately up to 0.25 ha / 2500 m^2 ▪ Height: Up to 10 m
Inverter / Transformer Stations	Several transformers will be installed with the following specifications: ▪ Height: Approximately 3 m ▪ Footprint: Approximately 220 m^2 each

COMPONENT	DESCRIPTION
On-site Substation	▪ Footprint: Approximately 1 ha ▪ Height of the on-site substation complex: Up to 10 m. However, the on-site substation will include switchgear portals up to 15 m and lightning masts up to 25 m in height. ▪ Capacity of the on-site substation: up to 132 kV ▪ Fence: Galvanized palisade fencing to be used at the substations ▪ Fence height: Up to 2.5 m
Associated Infrastructure	
Battery Energy Storage System (BESS)	▪ Preferred Technology: Lithium-Ion or Sodium-Ion (Solid state) ▪ Alternative Technology: Redox Flow ▪ Footprint: Up to 2.7 ha ▪ Height: Up to 10 m ▪ Capacity: Up to 1 200 MWh ▪ Fence: Galvanized palisade fencing ▪ Fence height: Up to 2.5 m
On-site medium voltage internal cables	▪ Placement: Underground (above ground (or a combination of both) pending technical constraints) ▪ Capacity: 33 kV ▪ Depth: Maximum depth of underground cables 3 m ▪ Safety: Danger tape will be placed at appropriate intervals above the cable to alert contractors or workers post-construction that buried electrical cable is located in the area they are excavating.
Access roads	▪ Existing roads will be used as far as practically achievable. The proposed project site can be accessed via the following road: o Divisional Road 2315 (DR02315); ▪ Refer to the Traffic Impact Assessment for additional information on the route options per project. ▪ A separate Environmental Assessment Process will be undertaken should any road upgrades trigger listed activities in terms of the 2014 NEMA EIA Regulations (as amended).
Internal roads	▪ Internal roads: The proposed project will have a total internal service road network of up to approximately 35 km. Permanent roads will be up to 6 m wide and may require side drains on one or both sides. All roads may have underground cables running next to them. A 12 m wide road corridor may be temporarily impacted during construction and rehabilitated to 6 m wide after construction. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles, temporary passing lanes, side drains, and/or stormwater control measures. The network layout is designed to provide efficient access to all elements of the facility and effective accommodation of the anticipated internal traffic. ▪ Details: New internal service roads and storm water control measures will need to be established. The internal service roads will comprise of both existing and new roads. Existing unnamed roads will be used as far as possible and will be upgraded, expanded, and compacted. New roads will be constructed in the absence of existing roads. ▪ Width: Approximately 4 – 6 m
Storm water channels	▪ Details to be confirmed once the Engineering, Procurement and Construction (EPC) contractor has been selected and the design is

COMPONENT	DESCRIPTION
	finalised. Where necessary, a detailed storm water management plan would need to be developed.
Work area during the construction phase (i.e. laydown area, site camp and temporary concrete batching plant)	▪ Temporary Laydown: Up to 4.6 ha. ▪ Temporary concrete batching plant: A temporary site camp establishment and concrete batching plant of ± 100 m x 100 m (1 ha).
Fencing	▪ The proposed built infrastructure on site will be secured via the installation of appropriate fencing for reasons such as security, livestock/ wildlife safety, public protection and lawful requirements. Existing livestock or wildlife fencing on the affected farm portions may be erected or upgraded where deemed insufficiently secured, whereas permanent fencing will be required around the O&M area, substation complex, and BESS. Access points will be managed and monitored by an appointed security service provider, if deemed required. The type and height of fencing to be installed will be confirmed during the detailed design phase prior to construction. ▪ Fence height: Up to 3 m for wildlife fencing.
Water Requirements	▪ Approximately 50 000 m^3 of water is estimated to be required per year for the construction phase. ▪ Approximately 3 500 m^3 of water is estimated to be required per year for the operational phase. ▪ Water requirements during the decommissioning phase are unknown at this stage. Potential water sources: Local municipality, third-party water supplier, existing boreholes, newly drilled boreholes on site or a combination of existing and newly drilled boreholes on site. ▪ Potential water supply methods: Trucked to site from an external source, bulk supply pipeline, or on-site borehole piped via a temporary HDPE pipe. ▪ A separate Environmental Assessment Process will be undertaken should the water supply method trigger listed activities in terms of the 2014 NEMA EIA Regulations (as amended). Additionally, GA or WULA will be undertaken post-EA in terms of the 1998 NWA.
Workforce	▪ Exact employment numbers may vary however the following estimates are provided: o Construction Phase: 250 – 350 employment opportunities, including low-skilled, semi-skilled, and skilled. o Operational Phase: 35 – 45 employment opportunities, including low-skilled, semi-skilled, and skilled.
Construction Period	▪ 24 to 30 months
Operational Period	▪ Once the commercial operation date is achieved, the proposed facility will generate electricity for 20 to 25 years.

Figure 2.6 is a schematic representation of the proposed WEF including its key project components and grid connection.

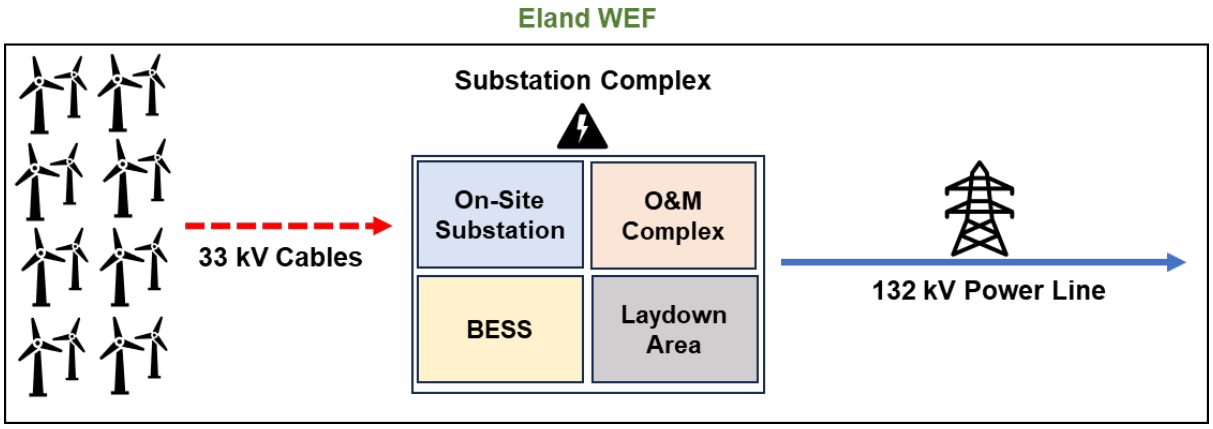


Figure 2.6: Schematic diagram of the proposed WEF and grid connection

2.3.1 General Description of a Wind Turbine and Wind Turbine Technology

Wind turbines generate electricity by converting movement or kinetic energy produced by the wind into electricity. Different turbine technologies achieve this through slightly different means. A typical horizontal-axis wind turbine consists of several components, which work together to generate electricity as depicted in Figure 2.7 below. When the rotor spins the shaft, the shaft spins the assembly of magnets, which generate voltage in the coil of wire. This voltage provides alternating electrical current, which could then be distributed through power lines. The wind turbine tower supports the rotor and nacelle and provides the height for the rotor blades to clear the ground safely, and to capitalise on atmospheric wind resources, which occur approximately 80 - 200 m above the earth's surface.

The proposed WEF will consist of a maximum of 27 individual turbines, which will be positioned at strategic locations on site which has been informed by the specialist assessment inputs. While the exact type of turbine technology is yet to be finalised, the WEF is expected to have a total generating output capacity of up to 270 MW.

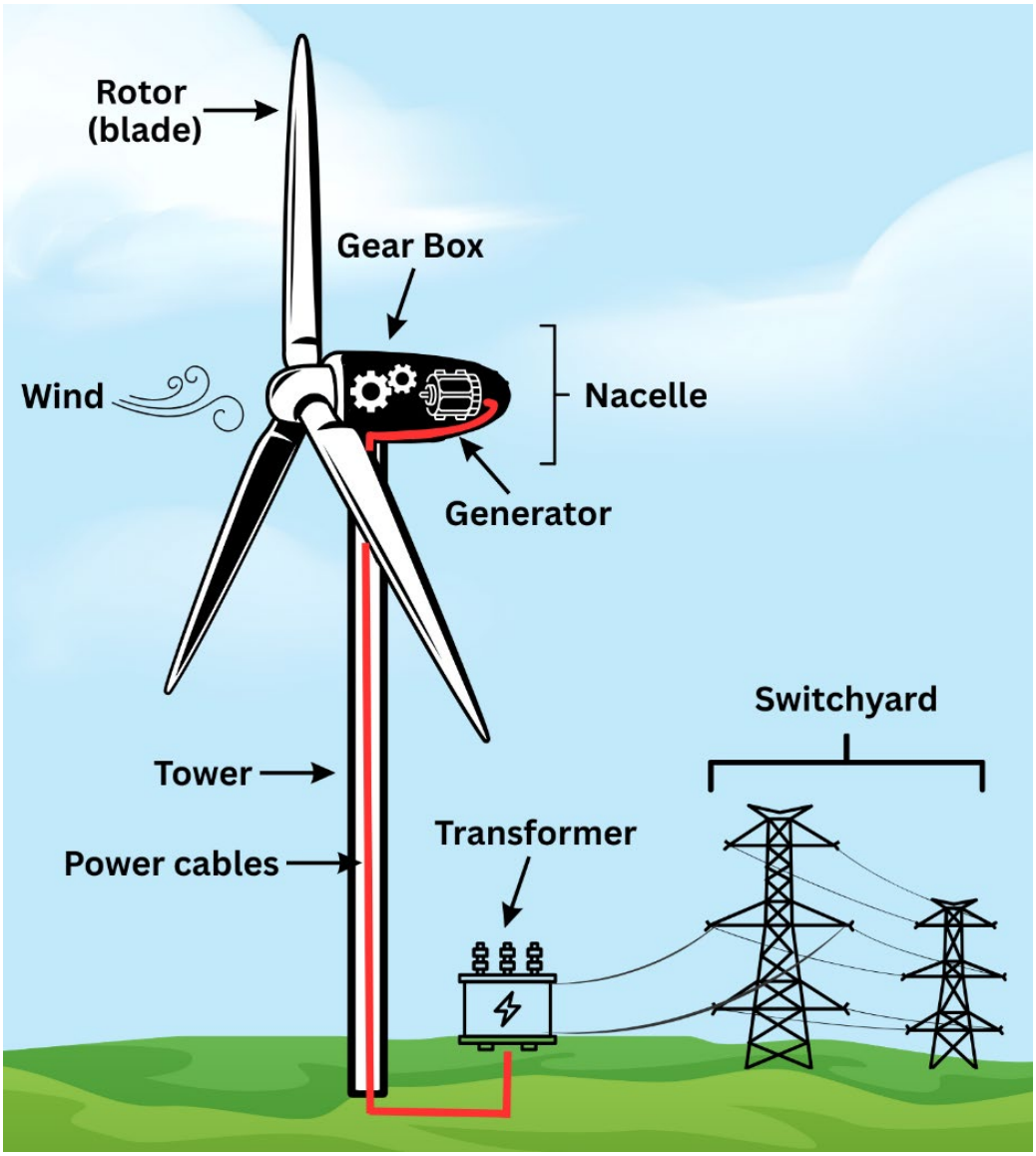


Figure 2.7: Generic design for a wind turbine (*Source*: CSIR, based on Tennessee Valley Authority, Wikimedia)

The energy output of a wind turbine ultimately depends on the size of the generator, velocity of the wind, the height of the hub, and the length of the rotor blades. Wind turbines operate at a range of wind speeds and have a start-up speed, which is the speed at which the blades and rotor start to rotate, and a cut-in speed, which reflects the minimum wind speed at which usable power is generated. This is typically about 3 - 4 m/s with full power output occurring at higher wind speeds of approximately 10 to 12 m/s. Wind turbines are also equipped with a cut-out speed or pitch control system as a safety feature to prevent mechanical damage at high or turbulent wind speeds. The cut-out speed is the highest wind speed after which a wind turbine will stop producing power, and a braking system will be activated. This is typically between 25 and 28 m/s depending on the manufacturer and type of turbine selected for implementation. The pitch control system will turn the rotor out of the mean wind direction and change the orientation of the blades so the rotor will capture lower wind speeds, and the output power of the generator stays within the allowed range. Once the wind drops below the cut-out speed back to a safe level, the turbine can resume normal operation.

Even though wind turbines are relatively tall they do not require extensive land space. Each turbine will have a circular foundation with a diameter of up to 64 m (resulting in a foundation area of 0.32 ha), and this will be placed alongside a hardstand area of up to 2.22 ha. The combined permanent footprint for each turbine hardstand and foundation (i.e. disturbed area per WTG) will be approximately 2.54 ha. It is important to note that the length and width of the hardstand / laydown area will change per WTG depending on the soil and topographic properties.

The comparatively small base of the turbine allows other activities to continue uninterrupted in the space underneath and around the turbine. Conventional large-scale development footprints often lead to habitat fragmentation and interference with fauna. As such, the micro-siting of the wind turbines will be in an optimum position that minimises the possibility of habitat fragmentation and interference with movement of fauna on the ground.

In terms of wind turbine technology to be used as part of the proposed development, the Project Developer is currently considering a range of wind turbine designs and generation capacity. The exact turbine specifications have not yet been confirmed. Some turbine specifications will only be finalised during the detailed design phase closer to construction. However, the “maximum development scenario” is presented and has been assessed by the specialists. The turbine technology selection process shall be subjected to further wind analysis and is also dependent on technical, commercial and site suitability assessment that will, in part, be informed by the findings of this S&EIA Process and confirmed at a later stage.

2.3.1.1 Blade Patterning

The South African Civil Aviation Technical Standard (SA-CATS) for Obstacle Limitations and Markings Outside of Aerodromes or Heliports[2] (i.e. SACATS 139) (effective from 1 August 2012) states the following:

> *Wind turbines shall be painted bright white to provide the maximum daytime conspicuousness. The colours grey, blue and darker shades of white should be avoided*

[2] SACAA (2012). SA-CATS 139 Aerodromes and Heliports. https://www.ellipsis.co.za/wp-content/uploads/2016/05/Obstacle_Limitations__Markings_Outside_Aerodrome_or_Heliport.pdf [online]. Accessed: September 2025

altogether. If such colours have been used, the wind turbines shall be supplemented with daytime lighting, as required.

South African Wind Energy Association (SAWEA) submitted an Alternative Means of Compliance (AMoC) application to the South African Civil Aviation Authority (SACAA) requesting deviation from the standard requirement of uniformly white blades. SACAA approved the request on 18 January 2024, thus allowing Independent Power Producers (IPPs) to adopt high-contrast designs to mitigate bird strikes.

This is in line with recent advances in turbine blade patterning research, both internationally and within South Africa, which have demonstrated that high-contrast blade markings applied to white turbine blades can substantially reduce avian collisions, particularly for raptors. Field trials in Norway illustrated a 72% reduction in all bird fatalities when two-thirds of a single blade was painted solid black, while preliminary results from the Umoya Wind Farm in the Western Cape suggest that a patterned blade design (i.e. two stripes) may also be effective[3].

Blade Patterning Guidelines published by the SAWEA, Birdlife South Africa (BLSA), and the Birds and Renewable Energy Specialist Group (BARESG) specify that the turbine blades should be painted red to comply with the SACAA regulations, and provides the following allowances for patterning turbine blades as per Figure 2.8:

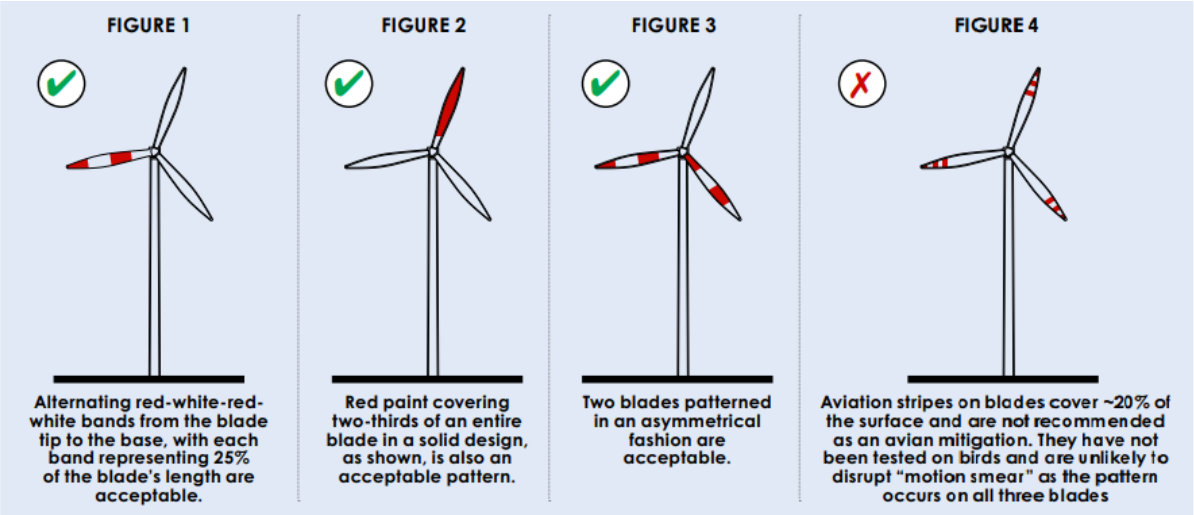


Figure 2.8: Visual illustration of turbine blade patterning recommendations (*Source*: BLSA, Blade Patterning Guidelines[2])

The guidelines also make provision for patterning all turbines to minimise conservation concerns, where patterning should be complemented with additional mitigation measures until there is robust statistical evidence to confirm that blade patterning is an effective standalone mitigation. The Avifaunal Specialist Report (Appendix G.4 of this Report) has recommended that all wind turbines must have one or two blades patterned according to the guidelines in conjunction with various additional mitigation.

[3] SAWEA, BLSA, and BARESG (2024). Blade Patterning Guidelines. https://sawea.org.za/sites/default/files/content-files/Documents/SAWEA%20BLSA%20Blade%20Patterning%20Guidelines%202024.pdf [online]. Accessed: September 2025.

In order to achieve the purpose of the AMoC approval, the final designs of the alternative markings must be submitted to the SACAA for consideration (prior to implementation). Additionally, the final designs must be accompanied by a full motivation of such markings from a South African Council for Natural Scientific Professions (SACNASP) registered avifaunal specialist.

2.3.2 Associated Infrastructure

2.3.2.1 Hardstand Areas

The hardstand area at each turbine will be established adjacent to each wind turbine base. This area will comprise a crane platform and a blade storage area approximately 2.22 ha for each WTG. A hard stand area is required adjacent all the turbine foundations. The purpose is to provide a flat, stable base on which to lay down the turbine components for assembly and erection. Additionally, it provides a base to site the two cranes required to lift the tower sections, nacelle, and rotor into place during the construction phase. During the operational phase, the hardstand area will be used to provide a platform for cranes to operate during scheduled and unscheduled maintenance, as well as a clear area to lay out turbine components prior to erection. The crane hard stand area will be retained post construction in order to allow for use of similar cranes, should major components need replacing during the operational phase of the development. A schematic illustration of a typical hardstand area and crane platform is provided in Figure 2.9 below.

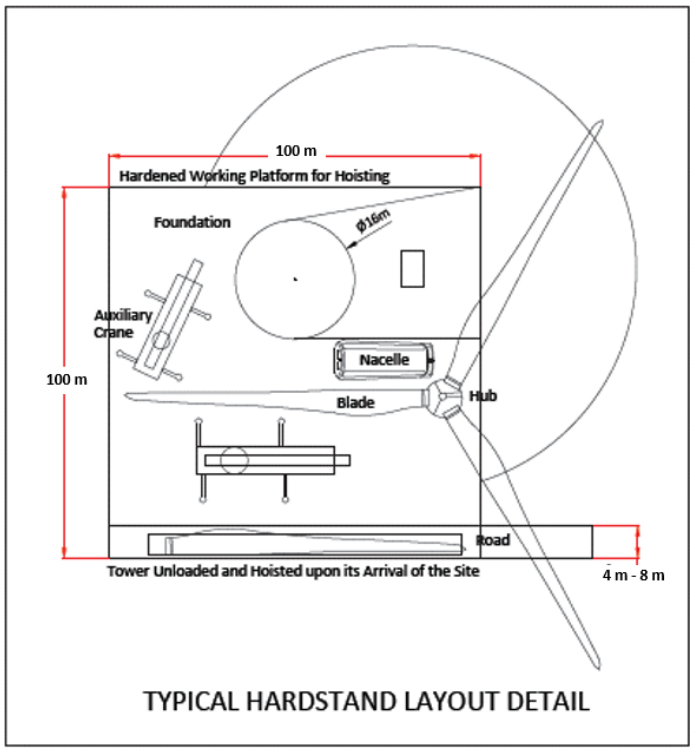


Figure 2.9: Example of a typical hardstand area at each turbine location

2.3.2.2 Construction Compound and Laydown Areas

During the construction phase, the proposed development will require the establishment of at least one temporary construction compound and one temporary laydown area. The temporary laydown area will cover an approximate footprint of up to 4.6 ha. The temporary construction site camp (inclusive of the concrete batching plant) will cover an approximate footprint of 1 ha.

2.3.2.3 Operations and Maintenance (O&M) Area

The on-site Operations and Maintenance (O&M) area is required to support the functioning of the proposed WEF and provide services to personnel who will be responsible for the construction as well as operation and routine maintenance of the facility during its lifespan. The proposed O&M area will have a footprint of approximately 0.25 ha, will be fenced with access control and will typically comprise of the following:

- O&M building / centre, (including a control centre, site offices, warehouses, workshop, visitors centre, guard houses etc);
- Worker amenities (e.g., canteen, bathroom/ablution facilities, changing room, staff lockers etc.);
- Storage structures for equipment, materials, fuel, oil, machinery etc. (e.g., containers, skips etc.);
- Security office and boom gate;
- Parking area;
- A concrete batching plant;
- Water storage (likely in 10 000 L above ground conventional (plastic) storage tanks); and
- Central waste collection and storage area.

It is anticipated that the O&M building complex, which will form part of the development footprint earmarked for the construction of the substation complex, will include the installation of a communications tower on site with a maximum height of 32 m. The maximum height of O&M area buildings and other related infrastructure is not likely to exceed 10 m.

2.3.2.4 Stormwater Channels and Water Pipelines

Stormwater drainage systems will be constructed on site to ensure that stormwater run-off from site is appropriately managed. Water from these systems is not likely to contain any chemicals or hazardous substances and will be released into the surrounding environment based on the natural drainage contours.

Details of storm water management are to be confirmed once the Engineering, Procurement and Construction (EPC) contractor has been selected, and the design is finalised. Where necessary, a detailed Storm Water Management Plan would need to be developed during the detailed design phase (post EA, should such an authorisation be granted) and to be implemented during all phases of the project. The plan must ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water or increased soil erosion. The plan should also include the installation of appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures promote the dissipation of storm water run-off. Recommendations for the management of storm water have been included in a Storm Water Management Plan in the EMPrs for the proposed project, as relevant (included in Appendix H.1 of this EIA Report).

Temporary water pipelines will be installed on site during construction for water supply to inter alia the concrete batching plant and the O&M building complex for domestic use and sanitation. Water supplied from either a nearby bulk supply pipeline or on-site borehole (both sources to be confirmed) will most likely be piped via a temporary HDPE pipe. Should the same sources be utilised during the operational phase then these pipelines will most likely be buried. A separate Environmental Assessment Process will be undertaken should the water supply method trigger

listed activities in terms of the 2014 NEMA EIA Regulations (as amended). Additionally, General Authorisation or Water Use Licence Application will be undertaken post-Environmental Authorisation (EA) in terms of the National Water Act (Act 36 of 1998, as amended).

2.3.2.5 Fencing

For various reasons such as security, livestock / wildlife safety, public protection and lawful requirements, the proposed built infrastructure on site will be secured via the installation of appropriate fencing. The fencing type could be palisade or mesh or fully electrified, with an estimated height of up to 3 m for wildlife fencing. Livestock or wildlife fencing on the affected farms portions may be erected or upgraded in places deemed insufficiently secure, whereas permanent fencing will be required around the O&M area, substation complex and Battery Energy Storage System (BESS). Galvanized palisade fencing with a height up to 2.5 m will be used at the O&M area, substation complex and BESS substation. Access points will be managed and monitored by an appointed security service provider. The type and height of fencing to be installed will be confirmed during detailed design phase prior to construction.

2.3.2.6 Internal Roads

New internal roads will also be constructed within the footprint of the WEF to provide access to the turbines. The internal roads will comprise farm roads (compacted gravel/dirt) or paved roads and will extend approximately 4 to 6 m wide. The total internal road network length is up to approximately 35 km, however it may vary slightly, depending on the final design.

Permanent roads will be up to 6 m wide and may require side drains on one or both sides. All roads may have underground cables running next to them. A 12 m wide road corridor may be temporarily impacted during construction and rehabilitated to 6 m wide after construction. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles, temporary passing lanes, side drains, and/or stormwater control measures. The network layout is designed to provide efficient access to all elements of the facility and effective accommodation of the anticipated internal traffic.

2.3.3 Electrical Components and Connection to Grid

2.3.3.1 Inverters, Low Voltage Cables, and Medium Voltage Cables

An inverter/transformer station will accompany each WTG at the proposed WEF. Each inverter/transformer station will be located on the hardstand adjacent to the respective WTG. The inverter/transformer stations will be connected to the proposed on-site substation, via medium voltage (33 kV) internal cables. It is most likely that the 33 kV internal cables will be underground to a maximum depth of 3 m. However, in the isolated event of crossing a feature hindering underground cabling (e.g., a road, topographical or environmental constraint) or depending on technical constraints, the reticulation lines may better be suited to be above ground in certain sections. Therefore, both below and above ground routings have been considered in this S&EIA process for medium voltage cables.

From a safety perspective, danger tape will be placed at appropriate intervals above the cables to alert contractors or workers post-construction that buried electrical cable is located in the area. This recommendation has been included in the EMPr (Appendix H.1 of this Report).

2.3.3.2 Substation Complex

The proposed project will also include a substation complex. The substation complex will cover a cumulative approximate footprint of 13 ha, with a height of up to 10 m, and generally stepping up from 33 kV to 132 kV. The substation complex is planned to include the following:

- 33/132 kV On-site IPP or facility substation (~1 ha);
- BESS (~2.7 ha)
- O&M buildings (~0.25 ha); and
- Laydown area (~4.6 ha).

The on-site IPP or facility substation will cover an area of approximately 1 ha within the substation complex, and with a maximum height of 10 m. However, the on-site substation will include switchgear portals up to 15 m in height and lightning masts up to 25 m in height. Galvanized palisade fencing will be used at the substation, with a fencing height of up to 2.5 m.

The on-site substation will be maintained by the IPP, focusing on the high voltage infrastructure leading up to the Point of Connection. This has been included in the current Application for Environmental Authorisation (EA) (i.e., for the WEF and associated infrastructure).

The BESS is described in the section below, and the O&M buildings and laydown area have been discussed in the sections above.

2.3.3.3 Battery Energy Storage System

The BESS will extend up to approximately 2.7 ha within the on-site substation complex, with a height of up to 10 m and a capacity of up to 1 200 MWh.

Battery storage offers a wide range of advantages to South Africa including electricity supply reliability and quality improvement. The main purpose of the BESS is to mitigate intermittency of wind energy by storing and dispatching of electricity when needed i.e., to contribute to the grid 24 hours/day, during peak demand at night or during power outages. In essence, this technology allows renewable energy to enter the completely independent power generation market.

Based on various discussions with the DFFE on previous occasions, it has been confirmed that BESS is not classified as containers or structures for the development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good. In addition, it was also confirmed based on discussions with the DFFE that BESS is not classified as a facility for the generation, transmission or distribution of electricity. Hence, listed activities pertaining to this aspect in the 2014 NEMA EIA Regulations (as amended) do not apply.

The BESS technology type will either be **Solid State Lithium-Ion, Solid State Sodium-Ion or Redox Flow**, with Lithium-Ion and Sodium-Ion being the **preferred type**. All three of these technologies were assessed during the Scoping and EIA Phase, and a motivation is included in Chapter 7 of the EIA Report to authorise the preferred technology type (i.e. Solid State **Lithium-Ion** and **Sodium-Ion**) since it was found to be acceptable and preferred during the EIA Phase. Additional information on the BESS technologies that have been considered is provided below.

- **Solid State Lithium-Ion Batteries (preferred technology)**

Lithium-Ion batteries are solid state, sealed systems i.e., pre-assembled off site and then delivered to site for placement as per specifications of the supplier. The supplier of the BESS will be confirmed during the detailed design. This BESS system consists of multiple battery cells that are assembled together to form modules. A module may consist of several cells working in conjunction. Each cell contains a positive electrode, a negative electrode and an electrolyte. The negative electrode for a lithium-ion cell is typically carbon. The positive electrode can be lithium iron phosphate or a lithium metal oxide. The electrolyte is usually a lithium salt dissolved in an organic solvent (CSIR, 2015[4]).

It is proposed that the Lithium-Ion would be housed in containers, with associated operational, safety and control infrastructure. The BESS will be a sealed unit and will remain sealed during operations.

Figure 2.10 is an illustration of a 25 MW / 50 MWh Lithium-Ion battery located at the 60 MW Gannawarra Solar Farm in Australia.

Figure 2.10: Example of Lithium-Ion BESS in the foreground (ARENAWIRE, 2018[5])

Figure 2.11 is an illustration of a 225 MW / 1 140 MWh Lithium-Ion battery located at the 540 MW Kenhardt Solar Farm in the Northern Cape, South Africa.

[4] CSIR, 2015. Final Environmental Impact Assessment Report for the proposed construction of Gemsbok Solar PV2 75 MW Solar PV facility on the Remaining Extent of Portion 3 of the Farm Gemsbok Bult 120, Kenhardt, Northern Cape. CSIR Report Number: CSIR/CAS/EMS/ER/2014/0010/B.

[5] Arenawire (2018). Solar battery storage in Victoria charging up for summer. https://arena.gov.au/blog/solar-battery-storage-in-victoria-charging-up-for-summer/ [online]. Accessed November 2021.

Figure 2.11: Example of Lithium-Ion BESS (white containers) at the Kenhardt Solar PV and BESS Projects, Norther Cape (Scatec Africa, 2025[6])

- **Solid State Sodium-Ion Batteries (preferred technology)**

Sodium-Ion batteries are solid state, sealed systems and pre-assembled off site, housed in containers / sealed units similar to Lithium-Ion BESS as described above. Sodium-Ion BESS are considered to show better performance, safety and efficiency (Green Building Africa, 2019[7]). Compared to Lithium-Ion BESS, Sodium-Ion BESS have "more abundant raw materials, lower fire safety risk, wider temperature operating conditions and higher depth of discharge capabilities" (Energy Storage News, 2025[8]). Research indicates that Sodium-Ion BESS have a significant potential to become "the most effective and sustainable energy storage solution in the future" (Bai and Song, 2023; Page 13[9]).

According to Wanison *et al.* (2024[10]), Sodium-Ion BESS are similar to Lithium-Ion BESS in terms of their physical appearance and internally. The main distinguishing factor between the two is that the anode and cathode current collectors of Lithium-Ion BESS usually have copper and aluminium foils; whereas Sodium-Ion BESS use aluminum foils for both electrodes (Wanison *et al.,* 2024). As a result, Sodium-Ion BESS have lower weights and material costs (Wanison *et al*., 2024).

Figure 2.12 is an illustration of a 50 MW / 100 MWh sodium-ion BESS located in Hubei province, China.

[6] Scatec Africa (2023). Energising tomorrow: Scatec ignites one of the world's largest hybrid solar and battery project in South Africa. https://scatec.com/2023/12/11/energising-tomorrow-scatec-ignites-one-of-the-worlds-largest-hybrid-solar-and-battery-project-in-south-africa/ [online]. Accessed May 2025.

[7] Green Building Africa (2019). World's largest sodium-ion battery storage project starts commissioning in China. https://www.greenbuildingafrica.co.za/worlds-largest-sodium-ion-battery-storage-project-starts-commissioning-in-china/ [online]. Accessed May 2025.

[8] Energy Storage News (2025). Large-scale hybrid lithium-sodium-ion BESS comes online in China. https://www.energy-storage.news/large-scale-hybrid-lithium-sodium-ion-bess-comes-online-in-china/ [online]. Accessed May 2025.

[9] Bai, H. and Song, Z. (2023). Lithium-ion battery, sodium-ion battery, or redox-flow battery: A comprehensive comparison in renewable energy systems. Journal of Power Sources, 580 (2023) 233426. https://doi.org/10.1016/j.jpowsour.2023.233426.

[10] Wanison, R., Syahputra, W. N. H., Kammuang-lue, N., Sakulchangsatjatai, P., Chaichana, C., Uma Shankar, V., Suttakul, P., Mona, Y. (2024). Engineering aspects of sodium-ion battery: An alternative energy device for Lithium-ion batteries. Journal of Energy Storage, 100 (2024) 113497. https://doi.org/10.1016/j.est.2024.113497.

Figure 2.12: Example of Sodium-Ion BESS in Hubei Province, China (Image Source: Sineng Electric, 2024[11])

- **Redox Flow Batteries (RFB) (alternative technology)**

Flow batteries generally comprise of three major components; a cell stack, auxiliary parts and electrolyte storage. The active chemical species in a flow battery are stored mostly externally in above-ground storage tanks, which contain the positive and negative electrolytes separately. The energy is stored in two chemical components, which are dissolved in a liquid to form electrolytes during operation. The energy density of a RFB is thus dependent on the size of the storage tanks (Parsons, 2017[12]).

A schematic representation of a typical RFB is provided in Figure 2.13 below.

There are two types of RFB's i.e., a 'true' RFB and a hybrid RFB. In a 'true' RFB the electro-active materials used to store energy remain dissolved in solution. Therefore, the energy is determined by the volumes of electrolyte available. Examples of a 'true' RFB is a Vanadium RFB and iron-chromium systems. Hybrid RFBs deposit at least one chemical species as a solid during the charge cycle, therefore preventing the complete separation of power and energy characteristics (Parsons, 2017[4]).

Examples of electrolytes for RFBs include Hydrochloric Acid and Sulphuric Acid, which are considered as dangerous goods in terms of the 2014 NEMA EIA Regulations (as amended).

[11] Sineng Electric (2024). Sineng Electric to Supply Energy Storage Solutions to the World's Largest Sodium-Ion Battery Energy Storage Project. https://en.si-neng.com/about/news/76 [online]. Accessed May 2025.
[12] Parsons, 2017. US Trade and Development Agency. South Africa Energy Storage Technology and Market Assessment. Order Number: TDA-IE201511210. USTDA Activity Number: 2015-11032A. Parsons Job Number: 640368.

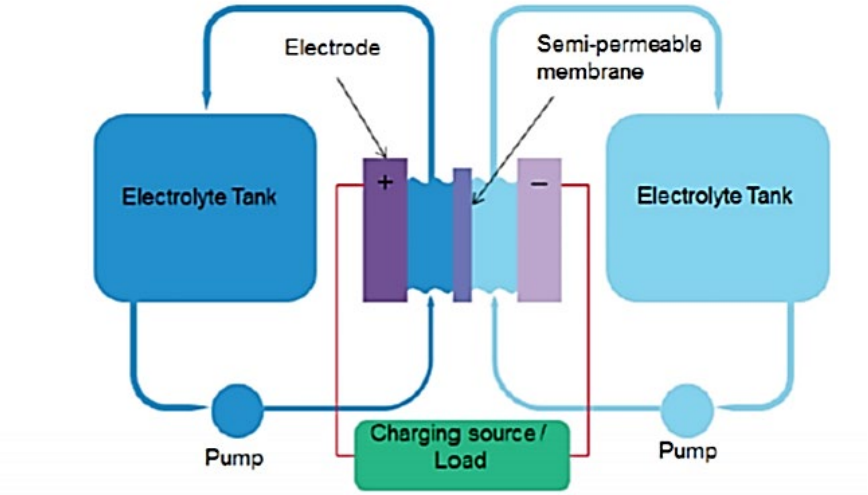


Figure 2.13: Schematic diagram of a typical Redox Flow Battery (Source: Parsons, 2017[4])

Activity 14 of Listing Notice 1 is for "*the development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres*". This listed activity is applicable to the Redox Flow BESS technology type as some of the electrolytes could be stored separately in above ground storage tanks for use in the Redox Flow BESS during operations. Activity 14 of Listing Notice 1 has not been included in the current Application for EA for purposes of the BESS specifically as the preferred BESS technology selected by the applicant is the Solid-State BESS (Lithium-Ion or Sodium-Ion).

- **Summary Statement on the BESS technologies**

The High-Level Safety, Health and Environment (SHE) Risk Assessment for the BESS (Appendix G.10) found that both Solid State technology options and Redox Flow technology options are acceptable for the proposed WEF development. The report provides high level information on the SHE risks of the BESS technologies being considered. According to ISHECON (2025[13]), the safety and health risks posed by RFBs[14] may be slightly lower than those of SSLB facilities, particularly with respect to fire and explosion risks. From an environmental spill and pollution point of view the VRFB systems present higher short-term risks than the SSLB systems. However, the above conclusions may be due to the fact that the VRFB technology is not as mature as SSLB technology and therefore there is not as much operating experience and accident information available for the VRFB.

Overall, from a SHE risk assessment point of view, there is no specific preference for a type of technology.

[13] ISHECON (2025). Battery Energy Storage System High-Level Safety, Health and Environment Risk Assessment. the proposed Genesis Eland WEF and associated infrastructure. Appendix G.10 of this Report.
[14] Vanadium is assumed for now; however alternative chemistry may be considered.

2.3.3.4 132 kV Overhead Power Line and Associated Infrastructure for the Eland WEF

To facilitate the connection of the proposed Eland WEF to the national electrical grid network, the Project Developer is proposing the construction of a dedicated 132 kV overhead power line from the proposed on-site substation at the Eland WEF to the proposed substation located at the Genesis Windy Plains WEF. The proposed substation located at the Genesis Windy Plains WEF is the subject of a separate Scoping and EIA Process.

The power line will extend between 17.4 and 31 m in height, and approximately 5 km in length. The registered servitude for the 132 kV power line will be up to 55 m wide (where multiple adjacent power lines occur), in line with the Eskom Distribution Guideline for overhead power lines. The entire servitude will not be cleared of vegetation. Vegetation clearance within the servitude will be undertaken in compliance with relevant standards and specifications.

The line will consist of either monopole or steel lattice type pylons (or a combination of both where required), with self-supporting and angle strain towers. The span lengths are estimated to range between 200 and 350 m for monopole pylons; and up to approximately 500 m for steel lattice structures. The size of the final constructed pylon footprint depends on the type of structure used, which will typically range from approximately 0.5 m^2 to 8 m^2 for monopole pylons; and 36 m^2 to 173 m^2 for steel lattice pylons. The working area required around a pylon position during the construction phase is approximately 30 m x 30 m (900 m^2). Exact specifications will be confirmed during the detailed design phase.

Underground power lines are not feasible because of technical losses involved with large lengths of underground cables and high costs. Maintenance is also easier on aboveground power lines in comparison to underground cables, the latter of which would result in more disruption.

An approximately 300 m wide assessment corridor (i.e., 150 m on either side of the centreline) has been assessed by all specialists for the 132 kV overhead power line to identify sensitivities and features that need to be avoided. The corridor for the 132 kV power line has been indicated in relevant maps in this Report. The power line route within the 300 m wide assessment corridor has also been identified. Should the power line route need to change post EA (should EA be granted), it is understood that such can be undertaken via a non-substantive EA amendment, provided that the power line is routed within the assessed 300 m corridor area and avoids all no-go areas identified by the specialists.

If required, a service road will also be constructed below the power line for maintenance purposes. Generally, service roads are composed of gravel and extend up to 4 m wide. Moreover, existing access roads or roads used during construction will be favoured to minimise additional impacts.

2.3.3.5 Background of the Overall Grid Connection for the Genesis WEFs and SEFs Cluster

The connection of the cluster of the Genesis WEFs and Solar Energy Facilities (SEFs) to the national grid is the subject of separate Applications for EA or have been included within the respective SEF and WEF applications for EA. The proposed grid connections are noted in the table below; however, these are subject to change. The table below includes the cluster, project, grid connection from and grid connection to, as well as the specific Environmental Assessment such grid connection is being applied under. The grid connection relevant to the proposed Eland WEF is noted in bold italicised font in the table below.

Table 2.4: Details of the grid connection for the Genesis Southern, Middle, and Northern Clusters

Cluster	Project	Connection From	Connection To	Environmental Assessment
Southern	Beau Valley SEF	Beau Valley SEF On-Site Substation	Beau Valley WEF On-Site Substation	This grid connection was included in the Beau Valley SEF EIA Process, which has concluded. This specific grid connection has received Environmental Authorisation (EA) together with the SEF.
	DBF SEF	DBF SEF On-Site Substation	Beau Valley WEF On-Site Substation	This grid connection was included in the DBF SEF EIA Process, which has concluded. This specific grid connection has received EA together with the SEF.
	Beau Valley WEF	Beau Valley WEF On-Site Substation	Middle Cluster Collector Substation	This grid connection will be subjected to a separate Environmental Assessment for the 132 kV Beau Valley WEF power line. This process has not commenced yet.
Northern	***Eland WEF***	***Eland WEF On-Site Substation***	***Windy Plains WEF On-Site Substation***	***This grid connection is included in this current Eland WEF EIA Process i.e. it is described in this chapter.***
	Windy Plains WEF	Windy Plains WEF On-Site Substation	Proposed Nuweveld MTS	This grid connection will be subjected to a separate Environmental Assessment for the 132 kV Windy Plains WEF power line. This process has not commenced yet.
Middle	Aloe WEF	On-Site Substations at the Middle Cluster	Proposed Nuweveld MTS	This grid connection will be subjected to a separate Environmental Assessment for the 400 kV external power line. This process has not commenced yet.
	Gazania WEF			
	Elegia WEF			

2.3.4 External Access Roads

A Traffic Impact Assessment (TIA) was commissioned for the proposed WEF. Note that EGI projects do not require Traffic Impact Assessments according to the Screening Tool, and the expected traffic generation for EGI projects are anticipated to be less than the WEF projects. The TIA has assessed the expected traffic related impacts of the proposed facility during the construction, operational and subsequent decommissioning phases. The purpose of the TIA is also to consider the traffic impact that the WEF would have on the surrounding road network and receiving environment during the construction of the access roads, construction, and installation of the turbines, as well as for maintenance during the operational phase.

The information presented below is based on the Traffic Impact Assessment[15] undertaken by Athol Schwarz (Athol Schwarz Consolidated Civil Engineering Solutions) (2025) (Appendix G.9 of this Report).

The existing public road network adjacent to the proposed development is well established, and consists of a combination of national roads, first, second, third, fourth and fifth-order public and private roads, which provides accessibility to the proposed development from the local towns and major commercial centres within South Africa. The road network adjacent to the proposed project and potential access routes are illustrated in Figure 2.14 below.

[15] Athol Schwarz (2025). Traffic Impact Assessment for the proposed Genesis Eland WEF and associated infrastructure. Appendix G.9 of this Report.

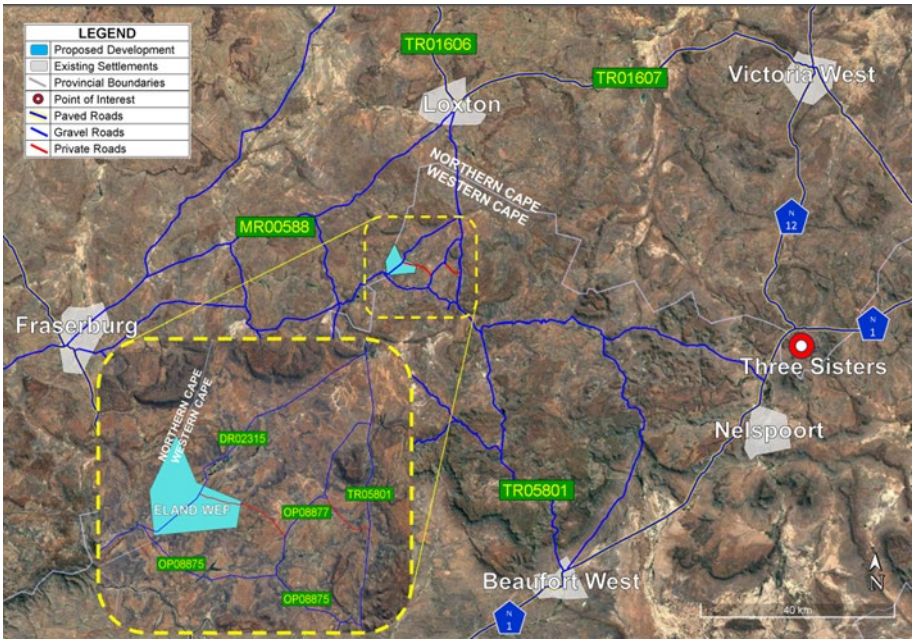


Figure 2.14: Public road network adjacent to the proposed project (Schwarz, 2025)

2.3.4.1 Site Access

The envisaged access to the proposed development would be from Divisional Road 2315 (DR02315). Note that a separate Environmental Assessment Process will be undertaken should any road upgrades trigger listed activities in terms of the 2014 NEMA EIA Regulations (as amended). However relevant triggers for widening and expansion of existing roads within the study area have been included in the current EIA Process.

2.3.4.1.1 DR02315

The DR02315 is a level 4 road classified as a collector road, providing accessibility to nearby towns and main roads. The DR02315 starts at the DR02313 and intersects with the DR02314 before ending at the TR05801 (R381). The section of the road between the DR02315 and TR05801 passes through a ravine, which requires a significant speed reduction. The width of the road is significantly less than the required 7 m, making passing other vehicles very difficult, as shown in Figure 2.15. This road passes through several drifts, gates, and by-passes several homesteads, travelling at high speed on this road is not advisable.

Figure 2.15: DR02315 (Schwarz, 2025)

There are several existing entrances to the proposed development that can be used, the most northerly entrance to the east is shown in Figure 2.16.

Figure 2.16: Existing northern entrance to the development located along the DR02315 (Schwarz, 2025)

2.3.4.2 Transportation routes

2.3.4.2.1 Commuter Routes

The towns in this part of the country are few and far apart. There are several towns within a 200 km radius of the proposed development from which the workforce is to be drawn. Based on statistics assessment it is assumed that the workforce will be drawn from either Beaufort West, Carnarvon, Fraserburg, Loxton, or Victoria West. The anticipated routes to the proposed development from the surrounding towns are indicated in magenta, in Figure 2.17.

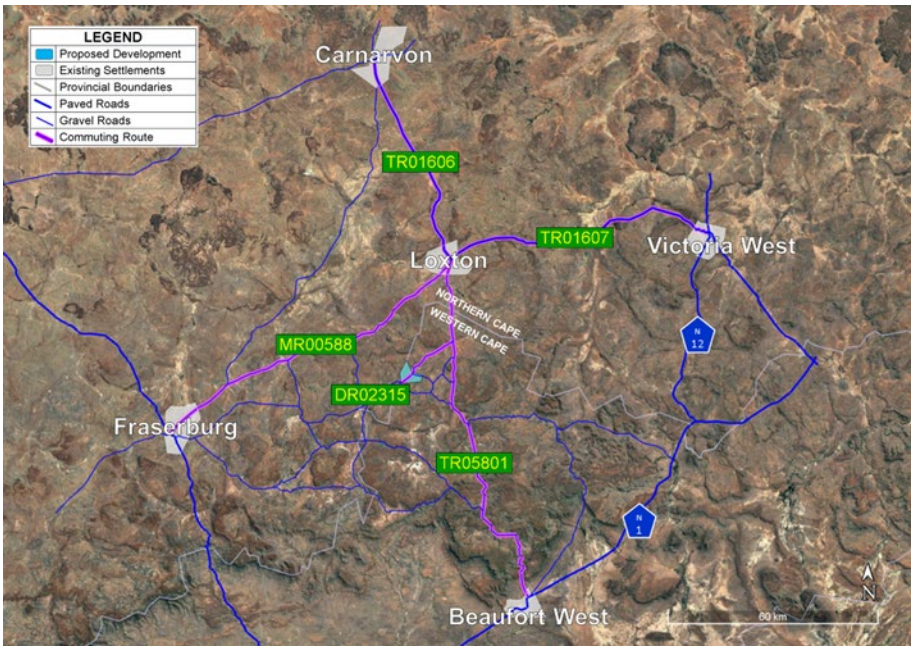


Figure 2.17: Commuting Routes to the Proposed Development

The proportionality of the workforce from the surrounding towns is based on a 'working-age' population, modified by a 'weighting factor', calculated based on the distance travelled to the proposed development from the relevant town. The expected proportion of the workforce from the surrounding communities is depicted in Table 2.5.

Table 2.5: Distance to Surrounding Towns

Town	Population	Travel Distance	Proportion (%)
Beaufort West	26292	106.0 km	65%
Carnarvon	5052	104.0 km	13%
Fraserburg	2280	134.0 km	4%
Loxton	743	40.0 km	5%
Victoria West	6123	121.0 km	13%

2.3.4.3 Freight Routes

2.3.4.3.1 Container Terminals

Transnet Port Terminals is a division of Transnet SOC Limited, South Africa's state-owned freight transport company, which owns and operates the terminals at several Ports in South Africa. Operations are divided into the major market sectors: containers, bulk, breakbulk, and automotive, organised into three geographical regions – Eastern Cape, Western Cape, and KwaZulu-Natal.

The port of entry into South Africa for all import WTG components for this development, is limited to Ngqura (close to Gqeberha) located in the Eastern Cape, or Saldanha Terminals located in the Western Cape. While all locally made WTG components are assumed to be manufactured in Cape Town area. The possible routes from these areas to the proposed development is via Victoria West and Loxton, indicated in magenta in Figure 2.18.

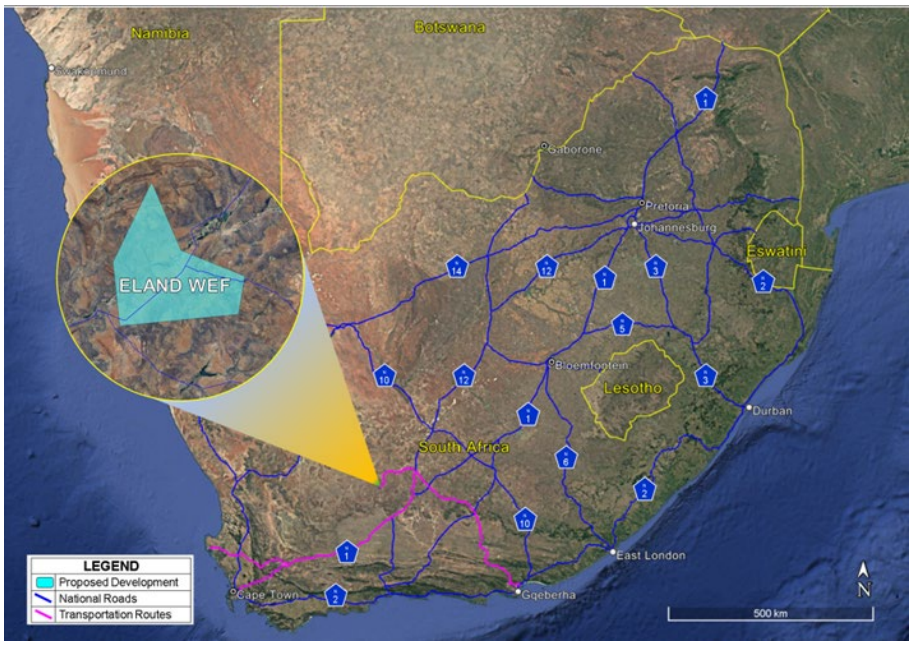


Figure 2.18: Freight Routes – Port Terminals

The potential transportation routes from the various Port Terminals / Towns in South Africa, with the capability to import wind turbine components, to the proposed development, are detailed in Table 2.6 below.

Table 2.6: Distance – Port Terminals

Container Terminal	Distance
Cape Town	716 km
Ngqura	570 km
Saldanha	780 km

Based on the information provided above, the closest terminal to the proposed development is the Ngqura Port Terminal (close to Gqeberha) located in the Eastern Cape.

However, the length and weight of the various WTG components will only be available once the turbine supplier has been appointed. There is a strong possibility that the length of the blades for the WTG units would be up to 100 m.

Each of the proposed transportation routes has their own unique challenges that the appointed logistics company will need to address. In some cases, the challenges can be easily overcome, and for others, alternative routes will have to be considered.

The preferred transportation route would ultimately be identified by the logistic company appointed to transport the various WTG components from the port of entry, or manufacture, to the proposed development.

2.3.4.3.2 Transportation of Wind Turbines

Most shipping vessels importing the turbine components will be equipped with on-board cranes to do all the safe off-loading of WTG components onto the abnormal transport vehicles, parked adjacent to the shipping vessels (Figure 2.19). The imported turbine components may be temporarily stored at the nearest laydown area within the port's bounds or transported directly from the Port of Entry to the laydown area at the proposed project site. Mobile cranes will be required at these laydown areas to position the respective turbine components at their temporary storage location.

Figure 2.19: Example of cranes at Port of Entry (Source: iWink Consulting (Pty) Ltd, 2023[16])

Wind turbine components can be transported in a number of ways with different truck / trailer combinations and configurations, which will need to be investigated at a later stage when the transporting contractor and the plant hire companies apply for the necessary permits from the Permit Issuing Authorities.

[16] iWink Consulting (2023). Transport Impact Assessment for the Kaladokhwe Wind Energy Facility 1. Compiled for the Scoping and EIA Process for the Kaladokhwe Wind Energy Facility.

For the transportation of the turbines from the Port of Entry to the proposed WEF site, the blades are the longest and possibly most vulnerable components of a wind turbine and hence needs to be transported with utmost care. The blades need to be transported on an extendible blade transport trailer or in a rigid container with rear steerable dollies. The blades can be transported individually, in pairs or in threes, although different manufacturers have different methods of packaging and transporting the blades.

In terms of the National Road Traffic Act, 1996 (Act No. 93 of 1996), the trucks delivering turbine components will be considered as abnormal loads. Approval i.e., relevant permits may have to be obtained from National, Provincial and/or Local Competent Authorities for the transportation of abnormal heavy components. This is normally the responsibility of the logistics company in charge of these components.

Figure 2.20 to Figure 2.23 below provide examples of transportation of some of the turbine components.

Figure 2.20: Example of a tower section being transported (Source: Google Images, 2022)

Figure 2.21: Example of a wind turbine blade being transported on an extendible trailer (Source: Google Images, 2022)

Figure 2.22: Example of a nacelle being transported (Source: Google Images, 2022)

Figure 2.23: Example of a hub and rotary units being transported (Source: Google Images, 2022)

2.3.4.4 Commercial Centres

The most likely transportation routes for domestically supplied and manufactured components from the major commercial centres to the proposed development are either Cape Town or Johannesburg (or any supplier along these routes), as shown in Figure 2.24 below.

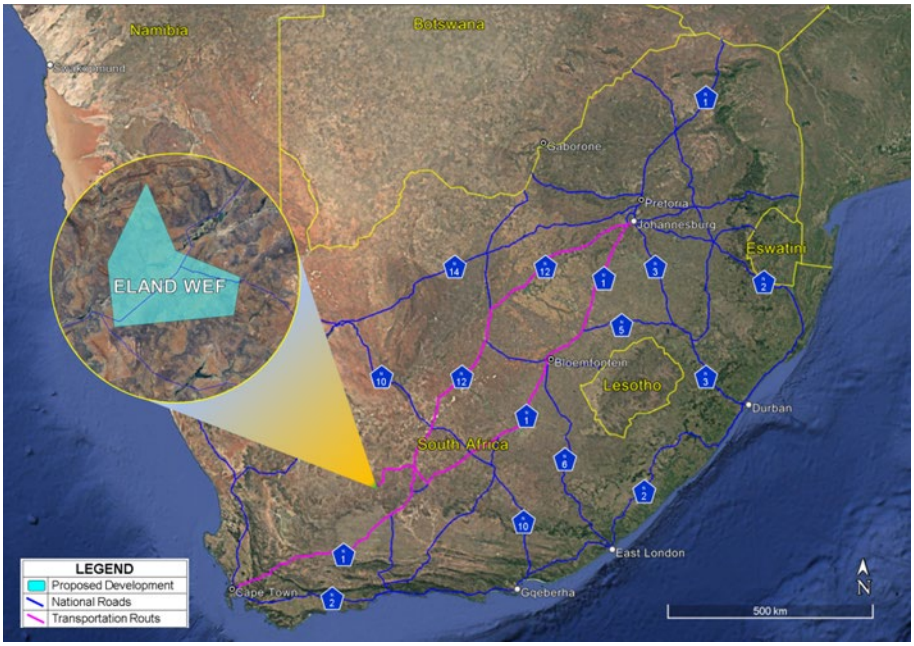


Figure 2.24: Freight Routes – Commercial Centres

The distances from the proposed developments to the major commercial centres in South Africa are shown in Table 2.7 below.

Table 2.7: Distance – Major Commercial Centres

Commercial Centre	Distance
Cape Town	716 km
Johannesburg (via N1)	1 004 km
Johannesburg (via N12)	966 km

Although the closest major commercial centre to the proposed development is located in the greater Cape Town area, many components will be fabricated in Johannesburg and transported to the proposed development.

2.3.5 Service Provision

The Project Developer will consult with the Beaufort West Local Municipality during the S&EIA Process in order to confirm the supply of services (in terms of water usage, sewage removal, solid waste removal, and electricity requirements) for the proposed project. The municipality was also consulted with as part of the 30-day public review period of the Draft Scoping Report and will also be consulted with during the 30-day review on the Draft EIA Report to seek general comment on the proposed project. Refer to Appendix E Part 1 of this EIA Report for a copy of the follow up and proof of correspondence sent to the municipality during the Scoping Phase. It is also important to note that municipal representatives were interviewed as part of the Socio-Economic Assessment undertaken for the project. The Project Developer will continue to seek feedback from the municipality during the relevant phases of the project.

Should the local municipality not have adequate capacity available for the handling of waste, provision of water and sewage handling provisions; then the Project Applicant will make use of private contractors to ensure that these services are provided. An outline of the services that will be required are discussed below.

2.3.5.1 Water Usage

The proposed project will require water during the construction and operational phases. Water requirements during the decommissioning phase are unknown at this stage. The estimated volumes of water required, intended use, and water sources are discussed in this section.

Water will be required during the construction phase, primarily for the purposes of concrete production and curing for the construction of turbine foundations, road construction as well as road compaction and dust suppression, earthworks and human consumption. High water usage is only anticipated during the first 18 months whereafter the monthly water usage will decrease drastically. The annual water use requirement during the construction phase is approximately 50 000 m^3. Only a limited amount of water (within the overall water usage estimates described in this chapter) will be utilised during construction for the batching of concrete. Details of the concrete batching plant will be confirmed during detailed design as the development progresses. Possible groundwater abstraction on site for purposes of the batching plant could be considered, if required, taking into account any necessary and relevant legal requirements. Additional information is provided below. The water use requirement during the operational phase will be primarily for human consumption and sanitation purposes. The total water consumption estimated for the operational phase of the WEF is approximately 3 500 m^3 of water per year for an approximate 20 to 25-year operational lifespan.

It is proposed that water preferably be sourced from the Beaufort West Local Municipality. In case municipal water supply cannot be confirmed, the Project Applicant will then investigate other sources of water supply for construction and operations of the proposed WEF considering any necessary licencing applications required in terms of relevant environmental legislation including but not limited to the National Water Act (Act 36 of 1998, as amended). Other possible sources include (i) water supply from a Private Contractor / third party supplier, (ii) water abstraction from existing boreholes on site, and/or (iii) water abstraction from one or more new boreholes located on site, and/or (iv) combination of existing boreholes and drilling new boreholes.

Water required for the construction, operational and decommissioning phases will either be sourced from the following sources (in order of priority and likelihood), either individually or as components of a water mix:

- The **Beaufort West Local Municipality** - specific arrangements will be agreed to with the local municipality in a Service Level Agreement (SLA), following the appointment of the proposed WEF as a preferred bidder, prior to construction. The water will be trucked in or made available for collection at the Local Municipal Water Treatment Plant via a metered standpipe.

- Investigation into a **third-party water supplier** which may include private services companies. This may include extraction from any available bulk water supply lines in the vicinity of the project site. This would be trucked in, or the water will most likely be piped via a temporary HDPE pipe. In the case of pipelines, these will most likely be buried should the same water sources be used during the operational phase.

- **Existing boreholes on site** to source groundwater (if available and if suitable). If groundwater is selected as the water source, then complete geohydrological testing and a Geohydrology Assessment, as well as a Water Use Authorisation process must be commissioned beforehand to determine whether the groundwater is available of a suitable quantity and quality. The study must also identify which boreholes may be used. This will be undertaken as a separate process, once more detailed information becomes available, outside of the current Application for EA for the proposed project and associated infrastructure.

  Temporary HDPE water pipelines may need to be constructed to transfer groundwater from existing boreholes or they may be transported by trucks from the boreholes to the site. In the case of pipelines, these will most likely be buried should the same water sources be used during the operational phase. This will be undertaken as a separate process, once more detailed information becomes available, outside of the current Application for EA for the proposed project and associated infrastructure. Groundwater may also need to be stored on site in suitable containers or reservoir tanks during the construction and operational phases.

- **New boreholes that will be drilled on site** to source groundwater (if available and if suitable), which will be subject to complete geohydrological testing and an assessment, as well as a Water Use Authorisation process. The study must also identify where the boreholes are to be located. This will be undertaken as a separate process, once more detailed information becomes available, outside of the current Application for EA for the proposed project and associated infrastructure. Refer to Chapter 4 of this Report for feedback on the authorisations required for this aspect in terms of the National Water Act (Act 36 of 1998, as amended). Similar pipeline specifications described above for existing boreholes will be adopted should new boreholes be drilled on site.

- **Combination of existing boreholes and drilling new boreholes** for further groundwater development. This scenario will depend on the following:
  - Whether permission is granted by land/farm owner to make use of the existing boreholes on their properties.
  - The volumes that could sustainably be abstracted from the relevant boreholes, this would need to be proven by scientific yield testing according to relevant standards.
  - The volumes that are currently being used by the farmer while bearing in mind permissible abstraction in terms of the GA.
  - Successful borehole drilling, i.e. intersection of groundwater with a reasonable quality and sufficient sustainable yield, which could supplement any shortfall required on the proposed project.
  - Groundwater quality will be a further factor in determining which boreholes are considered most appropriate for supply.

Refer to the details provided above regarding potential sources of existing boreholes and newly drilled boreholes.

2.3.5.2 Sewage or Liquid Effluent

The proposed project will require sewage services during the construction and operational phases. Low volumes of sewage or liquid effluent are estimated during both phases. Liquid effluent will be limited to the ablution facilities during the construction and operational phases. Portable sanitation

facilities (i.e., chemical toilets) and/or temporary conservancy tanks will be used during the construction phase, which will be regularly serviced and emptied by a registered contractor for disposal of at a registered municipal sewerage treatment facility. Due to the remote location of the project site, a waterproof conservancy tank system will be employed on site during the operational phase of the WEF for which a registered company will be contracted to store and transport sewage from site to an appropriate municipal wastewater treatment facility.

2.3.5.3 Solid Waste Generation

The quantity of waste generated will depend on the construction phase, which is estimated to extend 24 to 30 months. The following waste materials are expected:

- Packaging material, such as the cardboard, plastic and wooden packaging and off-cuts;
- Hazardous waste from empty tins, oils, soil containing oil and diesel (in the event of spills), and chemicals;
- Building rubble, discarded bricks, wood and concrete;
- Domestic waste generated by personnel; and
- Vegetation waste generated from the clearing of vegetation.

Solid waste will be managed via the EMPr during all project phases. The EMPrs (Appendix H) incorporate waste management principles. During the construction phase, general solid waste will be collected and temporarily stockpiled in skips in a designated area on site and thereafter removed, emptied into trucks, and disposed at a registered waste disposal facility on a regular or monthly basis by an approved waste disposal Contractor (i.e. a suitable Contractor) or the municipality. In addition, a skip will be placed on site, and any damaged or broken equipment will be stored in this skip. A specialist waste management company will be commissioned to manage and dispose of this waste.

Any hazardous waste (such as contaminated soil as a result of spillages) will be temporarily stockpiled 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.

During the operational phase after construction, the facility will produce minor amounts of general waste (as a result of the offices or maintenance).

Waste management is further discussed in the EMPrs (included in Appendix H of this Report).

2.3.5.4 Electricity Requirements

In terms of electricity supply, the developer may make use of generators on site during construction, and the operational electrical requirements would be nominal and would likely be supplied by the proposed facility.

2.4 Socio-Economic

It should be noted that the employment opportunity specifications provided in this report are estimates and is dependent on the final engineering design and the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) Request for Proposal provisions, or similar programme requirements, at that point in time.

2.4.1 Employment during Construction

During the construction phase, skilled, low skilled and semi-skilled temporary employment opportunities will be created. It is difficult to specify the actual number of employment opportunities that will be created at this stage; however, approximately 250-350 employment opportunities are expected to be created during the construction phase. The skill breakdown of employment opportunities is estimated as 55 % low skilled, 30 % semi-skilled and 15 % skilled.

The proposed construction phase will make use of local labour (including female labour) as far as possible. A majority of the low-skilled and semi-skilled employment opportunities will be made available to local residents. All non-local workers will be housed in rental accommodation in the nearby town i.e., Beaufort West and/or Loxton, and will be transported to site by bus daily. No workers will be accommodated in worker amenities on site during construction. Typically, the EPC contractor will be responsible for the provision of transport of construction personnel to and from site.

2.4.2 Employment during Operations

Approximately 35 - 45 full time employment opportunities will be created during the operational phase. The employment breakdown is estimated as 50 % low skilled, 40 % semi-skilled and 10 % skilled. The low and semi-skilled jobs will be linked to services such as maintenance and security. The percentage of temporary workers that may be offered permanent employment once the construction phase is completed will be dependent on the investor requirements, however, will meet the requirements of the REIPPPP (or similar process) at the time as well.

2.4.3 Socio-Economic Investment and Development

The Applicant will ultimately own the project, if successful, and will compile an Economic Development Plan which will be compliant with REIPPPP requirements (or similar process) and will inter alia set out to achieve the following:

- Create a local community trust or similar (as required by REIPPPP) which has an equity share in the project life to benefit historically disadvantaged communities;
- Initiate a skills development and training strategy to facilitate future employment from the local community;
- Give preference to local suppliers for the construction of the facility; and

- Support local community upliftment projects and entrepreneurship through socio-economic and enterprise development initiatives.

2.5 Overview of the Project Development Cycle

This section provides an outline of the main activities that are proposed during each phase of the proposed project, i.e., extending from the Planning and Design phase through to the Decommissioning phase. The operational life of the proposed WEF is expected to be approximately 20 to 25 years, which could be extended through regular maintenance and/or upgrades in technology.

The project can be divided into the following main phases:

- Detailed Planning and Design Phase;
- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

Each activity undertaken as part of the above phases may have environmental impacts and, where applicable, has therefore been assessed in the specialist studies (Appendix G of this Report).

2.5.1 Detailed Planning and Design Phase

The project layout plan, including the exact placement of each individual turbine, building infrastructure and the proposed internal service road network were revised based on specialist input received during the Scoping Phase, and were taken forward for further detailed specialist assessment during the EIA Phase. The project layout was informed by the findings of the specialist impact assessments, which includes the identification of sensitive biophysical areas that need to be avoided i.e., 'no-go' areas. The specialists have commented on and assessed the final project layout, and their findings are included in Chapter 6 and Appendix G of this Report. The turbine manufacturer and turbine generation capacity to be used will be dependent on availability of turbines in the international market, suitability to the South African wind climate, and service levels and experience available in South Africa, and will only be confirmed during the detailed design phase prior to construction (after EA, should such EA be granted).

2.5.2 Construction Phase

The construction phase will take place subsequent to the issuing of the EA (should such authorisation be granted) and if a successful bid in terms of the REIPPPP or a similar tender process is issued, and once a power purchase agreement (PPA) is signed with a suitable energy off-taker (either national government or private). As indicated above, the construction phase is expected to extend 24 to 30 months; however, the construction period is subject to the actual number of turbines to be erected, the final requirements of Eskom and the REIPPPP RFP provisions at that time.

The main activities that are proposed to take place during the construction phase will entail the clearance of vegetation within the approved development footprint to facilitate the construction and/or establishment of infrastructure including but not limited to the turbine locations, construction compound, temporary laydown area (for the storage of construction equipment, materials,

machinery, and turbine components), internal service roads and all relevant built structures. Next, the wind turbine foundations will be constructed at each approved turbine location with the aid of a mechanical excavator. Then follows the construction of the on-site substation. The construction of the substation buildings will entail development of the foundations and building structure as well as the installation of electrical infrastructure such as transformers, conductors, etc. Subsequently, the trenches for the installation of the electrical cabling to facilitate the connection of the wind turbines to the on-site substation will be excavated at a maximum depth of approximately 3 m between each wind turbine.

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 construction work will be undertaken in compliance with local, provincial and national legislation, local and international best practice, as well as the EMPrs (Appendix H of this 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.

2.5.3 Operational Phase

The following activities will occur during the operational phase:

- Operation of the WEF and generation of electricity to add to the national grid;
- Storage of energy generated by the WEF in electrochemical batteries;
- Routine maintenance of the WEF; and
- Unscheduled maintenance of the WEF.

Once the commercial operation date is achieved, the operational lifespan of the proposed project is expected to be approximately 20 to 25 years. The properties to be affected by the development of the proposed WEF will be leased from the property owners by the Project Applicant for the life span of the WEF project.

During the life span of the proposed project, wind turbines will be operational for this entire period except under circumstances of mechanical breakdown, extreme weather conditions, shutdown-on-demand or on-going maintenance which will be required on a scheduled basis to ensure the continued optimal functioning of the infrastructure. It is expected that the WEF will operate throughout the day and night (24 hours).

During the life span of the proposed project, on-going maintenance will be required on a scheduled basis to ensure the continued optimal functioning of the infrastructure. In general, maintenance on the structures will involve visual inspection, and only equipment that fails will be replaced in manner similar to that of construction activities. The EMPr for the WEF (Appendix H.1) includes the requirement for method statements to be compiled prior to the operational phase to describe the manner in which maintenance will be undertaken to ensure environmental impacts are minimised.

Also, as identified in the Agriculture Compliance Statement (Appendix G.1 of this Report), during the operational phase of the WEF, agricultural land use activities would be able to continue uninterrupted on all parts of the farmland other than the small project footprint, which excludes agriculture.

The projected operations are expected to provide several services and added economic spin-offs (as highlighted in Chapter 1 of this Report).

2.5.4 Decommissioning Phase

At the end of the operational phase, the WEF may be decommissioned, or may be repowered i.e., redesigned and refitted to operate for a longer period. The main aim of decommissioning is to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning arise i.e., if the facility becomes outdated or the land needs to be used for other purposes, the decommissioning procedures will be undertaken in line with an approved EMPr and relevant legislation at the time, and the site will be rehabilitated and returned to its pre-construction state insofar as possible.

Various components of the proposed WEF, which are to be decommissioned will be reused, recycled, or disposed of in accordance with the relevant regulatory requirements. All of the components of the wind turbines are considered to be reusable or recyclable. The turbines may also be traded or sold as there is an active second-hand market for wind turbines and/or it may be used as scrap metal. The decommissioning phase of the project is also expected to create temporary skilled and unskilled employment opportunities.

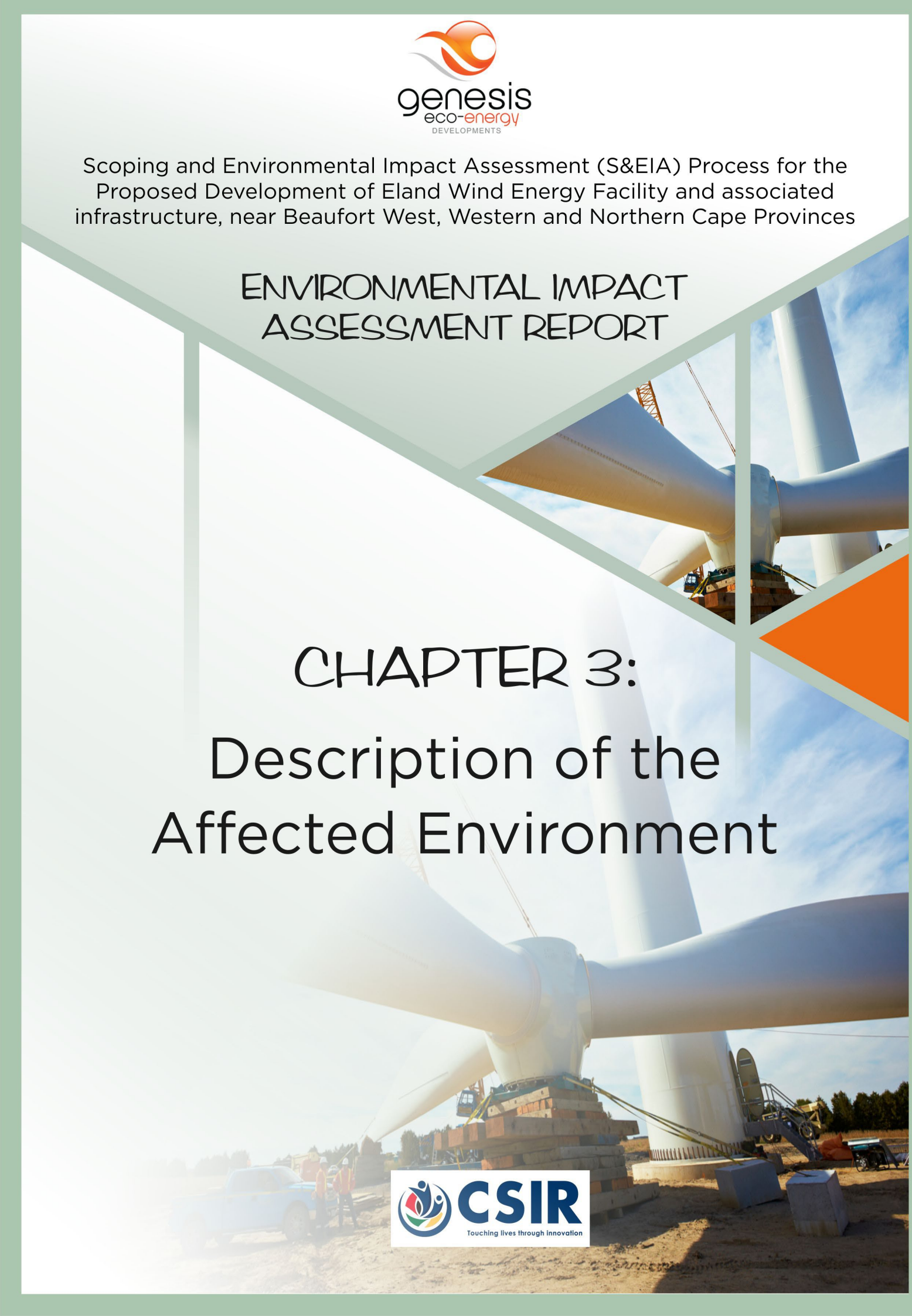
genesis eco-energy DEVELOPMENTS

Scoping and Environmental Impact Assessment (S&EIA) Process for the Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 3:

Description of the Affected Environment



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3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

This chapter of the Environmental Impact Assessment (EIA) Report provides an overview of the affected environment for the proposed Eland Wind Energy Facility (WEF) (hereafter referred to as the "WEF" or the "proposed project") and the surrounding area.

The receiving environment is understood to include biophysical, socio-economic, and heritage aspects, which could be affected by the proposed project or which in turn might impact on the proposed project.

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 chapter has been sourced from *inter alia*:

- Scoping and EIA inputs from the specialists that form part of the project team;
- Feedback from the National Department of Forestry, Fisheries and the Environment (DFFE) National Web-based Environmental Screening Tool[1] (hereafter referred to as 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), Endangered Wildlife Trust (EWT) Threatened Species No-Go Map;
- Western Cape Provincial Strategic Plan 2019-2024;
- Western Cape Provincial Spatial Development Framework (SDF), 2014;
- Western Cape Biodiversity Spatial Plan (WC BSP), 2023;
- Northern Cape Biodiversity Spatial Plan (NC 2024);
- Namakwa District Municipality (NDM) Integrated Development Plan (IDP), 2025-2026;
- Karoo Hoogland Local Municipality (KHLM) IDP, 2022-2027;
- Central Karoo District Municipality (CKDM) IDP, 2022-2027;
- CKDM SDF, 2020;
- Beaufort West Local Municipality (BWLM) IDP 2022-2027;
- BWLM SDF, 2024;
- Pixley ka Seme District Municipality (PKSDM), IDP 2022-2027;
- PKSDM SDF, 2022;
- Ubuntu Local Municipality (ULM), IDP 2022-2027; and
- Karoo National Park Management Plan, 2017-2027.

It is important to note that this chapter intends to provide a broad overview of the affected environment. Detailed descriptions of the proposed project site (i.e. the study area) that focus on significant environmental aspects of the proposed project are provided in the relevant specialist assessments (i.e., Appendix G of this EIA Report).

[1] Due to the progression of time since the submission of the Final Scoping Report, it is essential to consider both the initial Screening Tool Report (dated 2023) and a Screening Tool Report generated in 2025. As such, the maps and findings of both Screening Tool Reports are included and any changes are discussed, if relevant. Note that the aforementioned applies to all relevant environmental themes.

3.1 Background

As noted in Chapter 1 of this EIA Report, GEED is proposing to develop three clusters of WEFs and Solar Energy Facilities (SEFs), namely the Northern, Middle and Southern Cluster near Beaufort West within the Beaufort West Local Municipality and the Central Karoo District Municipality in the Western Cape Province. One of the Wind Energy Facilities (WEFs) within this cluster, namely the Eland WEF (i.e. this proposed project), extends into the Karoo Hoogland and Ubuntu Local Municipalities in the Northern Cape Province. Refer to Chapter 1 for a locality map of the study area.

The study area or preferred site for the proposed Eland WEF and associated infrastructure is the full extent of the affected farm properties on which the proposed project and associated infrastructure is planned to be constructed. Refer to Chapter 2 and Chapter 5 of this EIA Report for feedback on the process followed to assess the study area (including information on the affected farm portions) and to identify the buildable areas, as well as the layout and development footprints for the proposed project.

3.2 Biophysical Environment

3.2.1 Climate and Climate Change

3.2.1.1 General Context

According to the Köppen-Geiger climate classification system, the project site falls within the "BWk" category, which denotes a cold arid climate (Figure 3.1). In this system, "B" represents dry climates where limited precipitation is the primary constraint on vegetation growth, rather than temperature[2]. These dry climates are further subdivided into arid (BW) and semi-arid (BS) zones. A third letter is used to indicate temperature: "h" for hot and "k" for cold. Thus, the "BWk" classification indicates that the area experiences both low rainfall and relatively cold conditions

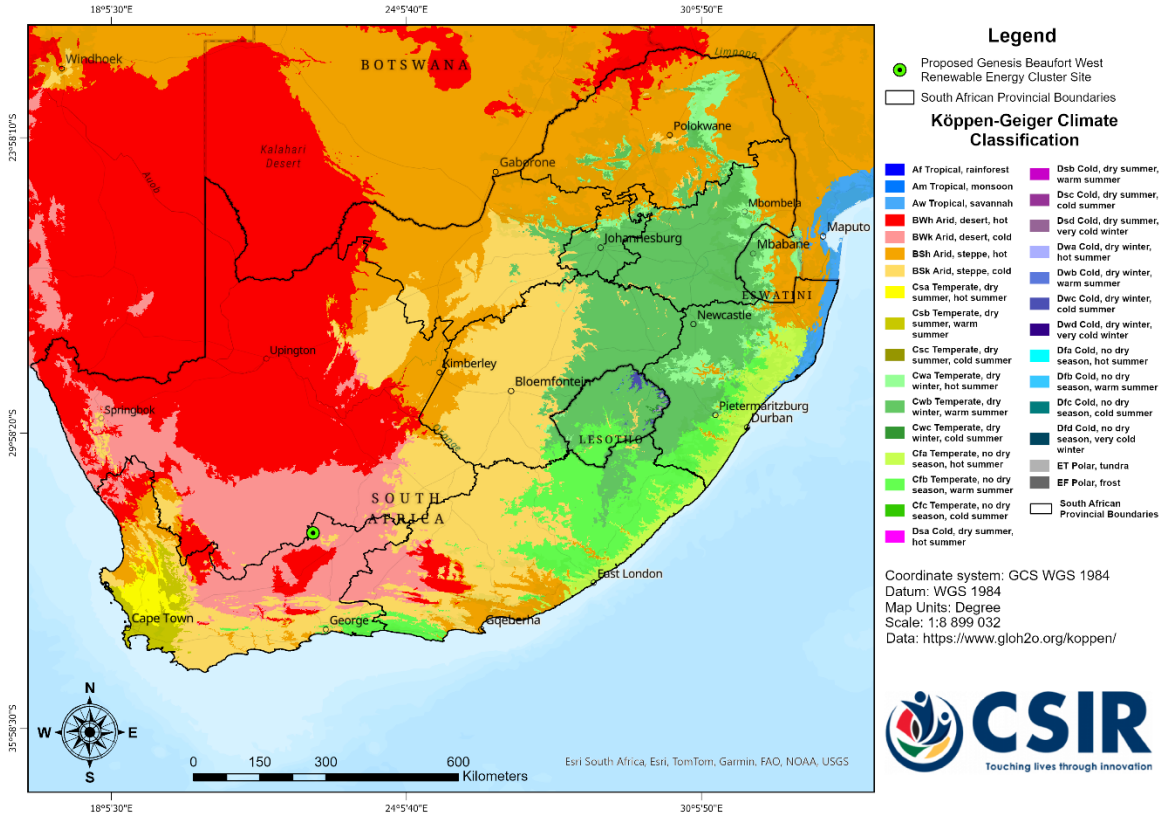


Figure 3.1: Köppen-Geiger Climate Classification of South Africa, including the study area (Source: Köppen-Geiger Climate Classification, 2024[3])

[2] Arnfield, A.J., 2025, Köppen climate classification. Available at: https://www.britannica.com/science/Koppen-climate-classification [online]. Accessed: June 2025.

[3] Beck, H.E., T.R. McVicar, N. Vergopolan, A. Berg, N.J. Lutsko, A. Dufour, Z. Zeng, X. Jiang, A.I.J.M. van Dijk, D.G., 2023. Miralles High-resolution (1 km) Köppen-Geiger maps for 1901–2099 based on constrained CMIP6 projections. Scientific Data, 10, 724, doi:10.1038/s41597-023–02549 6 (2023). Available at: https://www.gloh2o.org/koppen/ [online]. Accessed: May 2024.

The proposed project is located near Beaufort West and the region is characterised with a long term (1950 – 2000) mean annual rainfall of 195 mm with the bulk of rainfall generally received in the summer and early autumn months (i.e. between December to April) (Figure 3.2). Figure 3.3 shows the average annual rainfall within the region for the period 2010 to 2022. Average maximum temperatures range from 13°C in June to 29°C in January. Figure 3.4 shows the average monthly maximum and minimum temperature within the region. As shown in Figure 3.5, the area is characterised by relatively consistent sunny days throughout the year, with the lowest quantity of sun hours generally experienced in June. The area is characteristic of gusty winds prevailing for most of the year, with the average gust falling within the 20 kmph to 30 kmph range, for the period 2010 to 2022 (Figure 3.6).

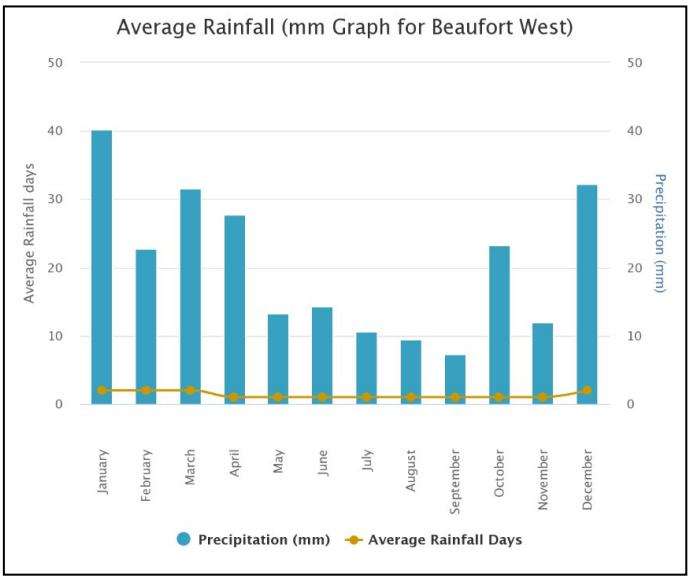


Figure 3.2: The average monthly distribution of rainfall within the Beaufort West area, including the study area (Source: World Weather Online, 2023[4])

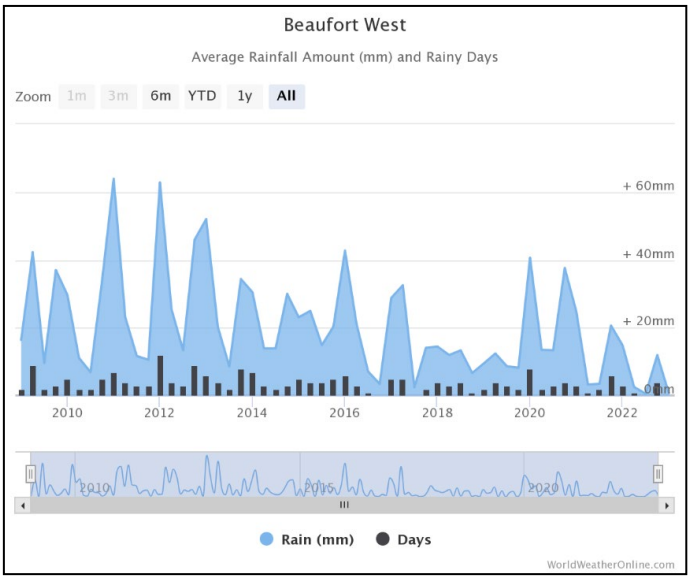


Figure 3.3: The average annual rainfall within the Beaufort West area, including the study area for the period 2010 – 2022 (Source: World Weather Online, 2023[5])

[4] World Weather Online. 2023. Beaufort West Annual Weather Averages. Available at: https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za.aspx [online]. Accessed: 19 February 2023.

[5] World Weather Online. 2023. Beaufort West Annual Weather Averages. Available at: https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za.aspx [online]. Accessed: 19 February 2023.

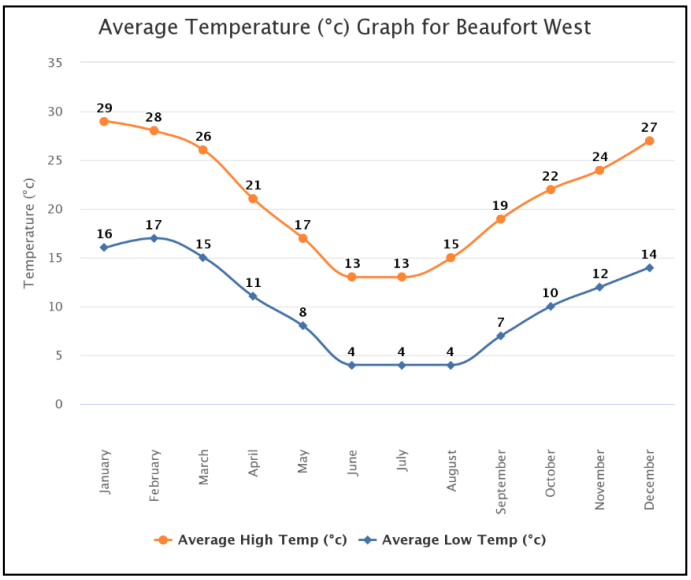


Figure 3.4: The average monthly maximum and minimum temperature for the Beaufort West area, including the study area (Source: World Weather Online, 2023[6])

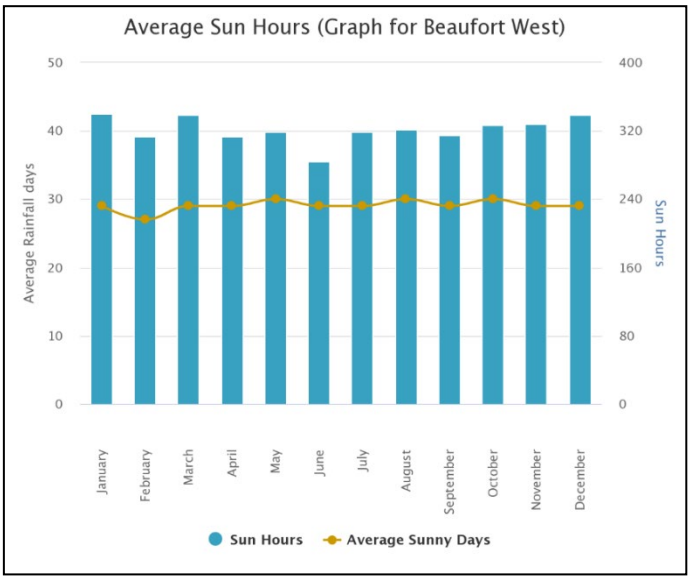


Figure 3.5: The average sun hours and sunny days per month for the Beaufort West area, including the study area for the period 2010 – 2022 (Source: World Weather Online, 2023[7])

[6] World Weather Online. 2023. Beaufort West Annual Weather Averages. Available at: https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za.aspx [online]. Accessed: 19 February 2023.

[7] World Weather Online. 2023. Beaufort West Annual Weather Averages. Available at: https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za.aspx [online]. Accessed: 19 February 2023.

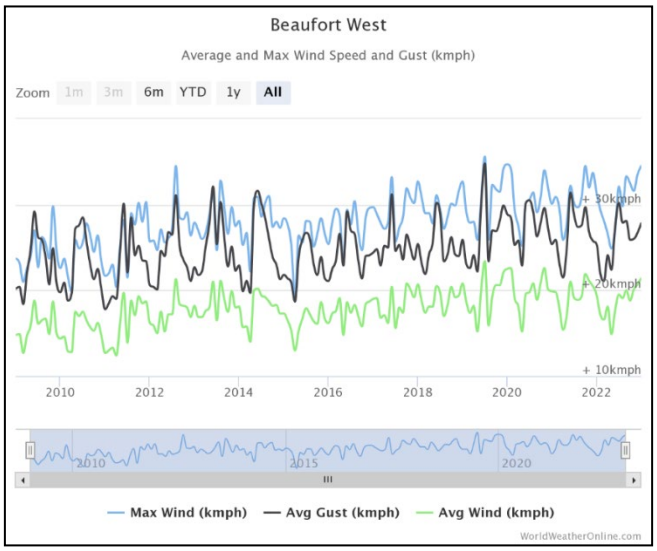


Figure 3.6: The average and maximum annual wind speeds and gusts for the Beaufort West area, including the study area for the period 2010 – 2022 (Source: World Weather Online, 2023[8])

3.2.1.2 Climate Change

While climate projections inherently involve uncertainty, particularly in inland regions of the Western Cape, there is a high degree of confidence that existing climate trends will intensify under future climate change scenarios[9]. Specifically, the Central Karoo District Municipality faces high climate risks due to its arid environment and long-standing vulnerability to drought, despite the district contributing only 1% of the Western Cape's total CO_2 emissions from the energy sector [10]. On a local level, climate change is already presenting significant challenges for the Beaufort West Local Municipality, and these are anticipated to become more severe over time. Amongst others, key projected climate change impacts include[11]:

- More frequent and intense droughts, with extended dry periods placing increasing pressure on already scarce water resources.
- Reduced water availability, as a result of shifting rainfall patterns and higher evaporation rates.
- Decreased agricultural productivity, driven by water scarcity and land degradation.
- Increased heat stress, particularly affecting vulnerable populations such as children and the elderly.

[8] World Weather Online. 2023. Beaufort West Annual Weather Averages. Available at: https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za.aspx [online]. Accessed: 19 February 2023.

[9] Beaufort West Municipal Spatial Development Framework (MSDF). 2024. Available at: https://beaufortwestmun.co.za/sites/default/files/documents/2024%20Beaufort%20West%20MSDF.pdf [online]. Accessed: 23 June 2025.

[10] Central Karoo District Municipality Integrated Development Plan (IDP) – Second Adjustment – 2024/25. Available at: https://skdm.co.za/sites/default/files/documents/Final%20CKDM%20Adjustment%20IDP%20-%20July%202024-2025.pdf [online]. Accessed: 24 June 2025.

[11] Beaufort West Integrated Development Plan 2020/2021. 2020. Available at: https://www.cogta.gov.za/cgta_2016/wp-content/uploads/2020/12/Beaufort-West-2020-21-IDP-Goedgekeur-en-aanvaar-op-29-Mei-2020-per-item-8.1.pdf [online]. Accessed: 23 June 2025.

- Greater climate variability, complicating planning efforts across sectors such as infrastructure, disaster response, and public health.

These key projected impacts are also depicted in the CSIR Green Book Municipal Risk Profile Tool[12], which provides temporally dynamic risk profiles, including information on the impacts of climate change for each municipality and its settlements. The Green Book provides the following information relating to the anticipated impacts of changing hydro-meteorological hazards on the Beaufort West Local Municipality under the Representative Concentration Pathways (RCP) 8.5 climate change mitigation scenario (i.e. a low mitigation and worst-case scenario):

Fire Likelihood – Presently, the likelihood of wildfires occurring in the wildland-urban interface (the boundary or interface between developed land and fire-prone vegetation) near Beaufort West is rare. The likelihood of wildfires near Beaufort West increases to low by the year 2050, whereas the projected number of fire danger days under an RCP 8.5 scenario ranges between 60 to 80.

Flood Hazard – The study area presently has a low flood hazard index. It is projected that the area will experience a moderate increase in extreme rainfall days under an RCP 8.5 scenario, however, Beaufort West will have a low potential increase in exposure to flooding.

Drought – In terms of the projected change in drought tendencies (i.e. the number of cases exceeding near-normal per decade) for the period 1995 to 2024 relative to the 1986 to 2005 baseline period, under an RCP 8.5 scenario, there was an increase in drought tendencies per 10 years within the study area. With regards to projected change in drought tendencies for the period 2035–2064 relative to the 1986–2005 baseline period, it is anticipated that the study area will experience an increase drought tendencies. Beaufort West is at a high risk of increased drought tendencies by the year 2050.

Climate change response is both about reducing vulnerability to climate impacts and developing the adaptive capacity to cope with changes that can no longer be avoided[11]. While the region's direct role in emissions reduction may be limited, its abundant solar and wind resources hold strategic value in supporting national climate objectives[10]. At the same time, the region's resilience will depend on the implementation of urgent, proactive, and long-term adaptation measures that address local vulnerabilities and build community capacity to withstand future climate shocks[10].

3.2.2 Topography and Landscape

The proposed site lies on the plateau, north of the Great Escarpment. The Great Escarpment, a major topographical feature in Africa extends from Limpopo, past Lesotho (known as the Drakensberg), down into the Western Cape before it extends northwards into Namibia and Angola. The Nuweveldberge, on which the proposed study area, forms the central and most arid component to the southern Great Escarpment which straddles the Northern and Western Cape.

Elevation ranges from approximately 750 m above sea level (a.s.l.) to the south of the proposed site, below the escarpment, to approximately 1 950 m a.s.l. on the tops of the mountains to the east. The proposed development site itself is located at an average elevation of 1 750 m a.s.l, comprising a wide flat area surrounded by hills and drained by small watercourses (Figure 3.7).

[12] Engelbrecht, F., Le Roux, A., Arnold, K. and Malherbe, J., 2019. Green Book. Detailed projections of future climate change over South Africa. Pretoria: CSIR. Available at: https://riskprofiles.greenbook.co.za/ [online]. Accessed: 24 June 2025.

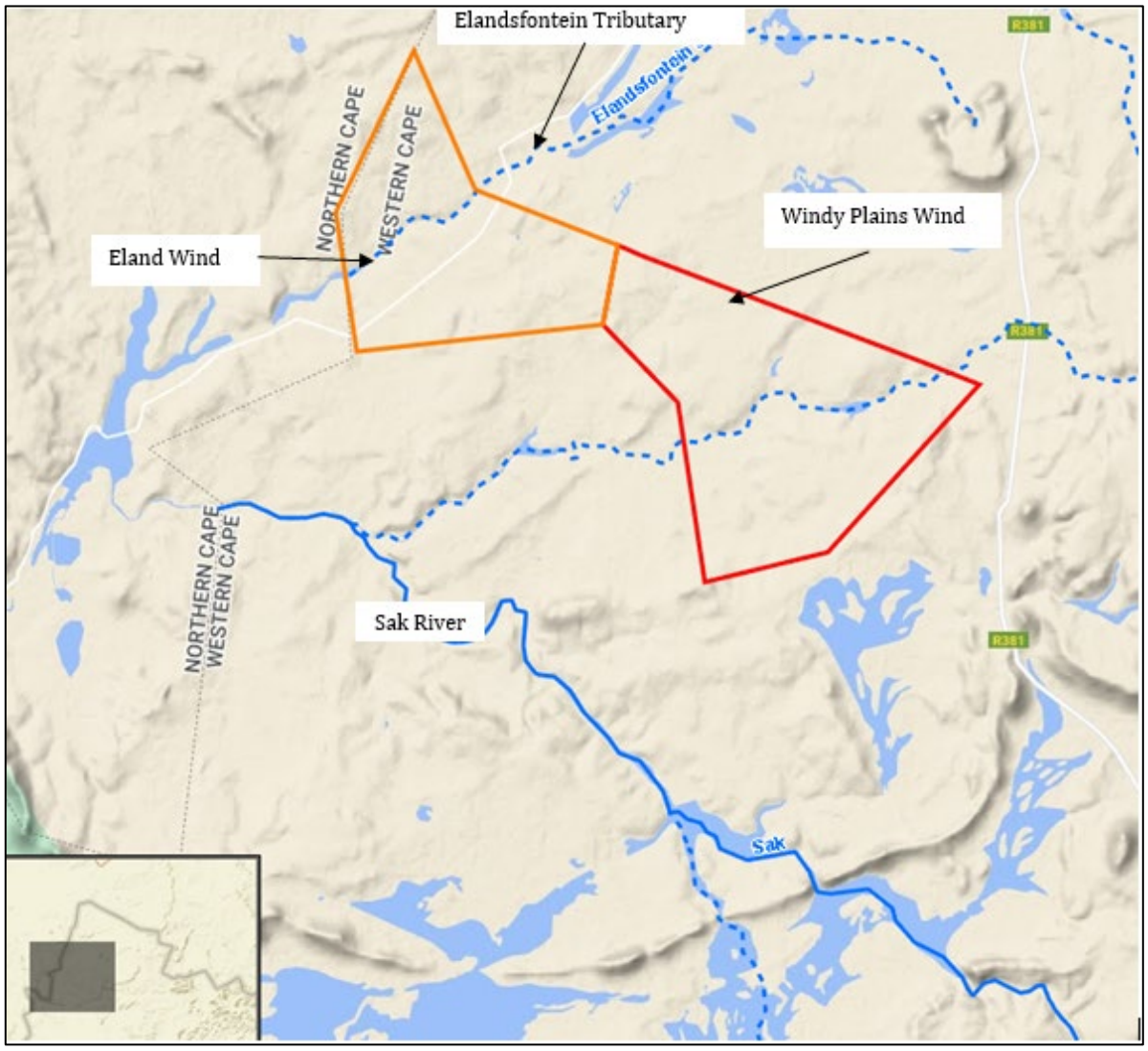


Figure 3.7: Relief map for the area, showing the topography and main watercourses and the location of the proposed project (CapeFarmMapper, 2023).

Figure 3.8: Superficial sediments with low lying bossieveld, and sandstone-capped hills of the Poortjie Member in the background (Source: E Butler, 2025; Appendix G.7).

3.2.3 Geology and Soils

The information described below is based on EIA level inputs provided by the Terrestrial Biodiversity, Palaeontology, and Geotechnical Specialists, which are included in Appendix G.2, G.7, and G.11 of this EIA Report, respectively.

The main geology of the study area is listed in Table 3.1, and an extract from the 1:250 000 geology map 3222 Beaufort West (Council for Geoscience, Pretoria) overlain by the study area is shown in Figure 3.9.

Table 3.1: Geological formations within the study area listed in order of relative age

Symbol	Member	Formation	Group	Lithology
~	Quaternary Deposit			Alluvium
Jd	Jurassic Intrusion			Dolerite
Ptp	Poortjie	Teekloof	Beaufort	Relatively arenaceous sandstone-mudstone unit
Pte	Teekloof		Beaufort	Brownish-red and greenish-grey mudstone, subordinate siltstone and sandstone

As mapped in Figure 3.9, the proposed WEF is mostly underlain by the Poortjie Member (Teekloof Formation, Adelaide Subgroup, Beaufort Group, Karoo Supergroup) with a very small area underlain by dykes and sills of Jurassic Dolerite. Very few bedrock exposure are present in the development footprint. Yellow sandstones form cliffs/kranzes with rock rubble, while darker mudrocks are well-exposed in streams, river-banks and hill slopes. Major drainage lines are associated with gravelly, sandy to silty Late Caenozoic alluvium concealing potential bedrock exposures. These superficial sediments are not indicated on the 1:250 000 Beaufort West geological map.

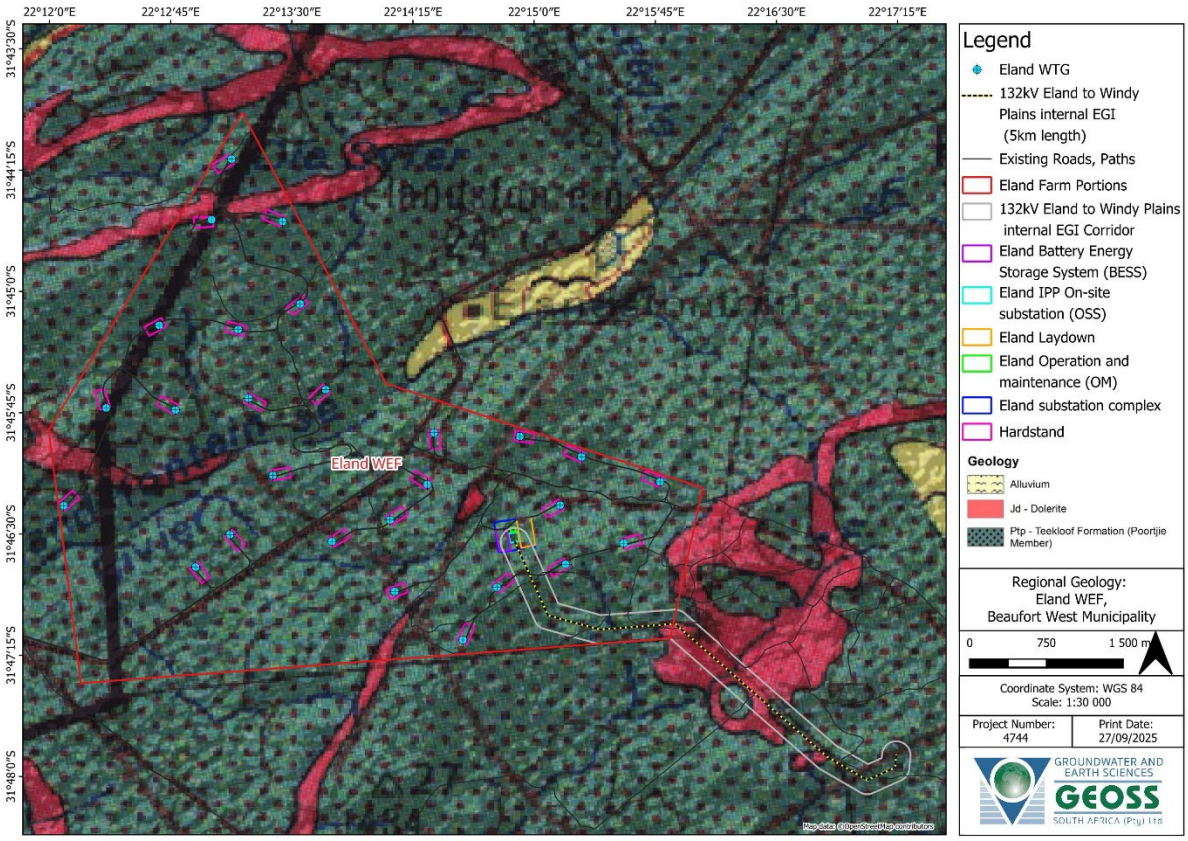


Figure 3.9: Geological setting for the proposed project and associated infrastructure (Source: Council for Geoscience, 1997, Map: 1:30 000 scale; Beaufort West 3222 in GEOSS, 2025, Appendix G.11).

Partially calcretised older alluvium deposits often overlies dolerite. Gravelly colluvial and eluvial deposits are dominated by hornfels, sandstone, and dolerite rubble that mantles most hillslopes and plateaus. The topographically relief of the Beaufort Group in the development footprint is low. The Loxton area is extensively intruded by dolerite dikes and sills (Jd, red) of the Karoo Igneous Province, although only small areas in the development is underlain by dolerite. The area is also known for its dolerite koppies. The dolerite intrusions have baked the surrounding potentially fossiliferous Beaufort Group sediments thus compromising the fossil heritage of the area through thermal metamorphism.

3.2.4 Agriculture and Land Capability

The information described below is based on the Agriculture Compliance Statement included in Appendix G.1 of this EIA Report.

3.2.4.1 General Context

Agricultural sensitivity, in terms of environmental impact, is a direct function of the capability of the land for agricultural production. The Department of Forestry, Fisheries and the Environment (DFFE) National Web-Based Screening Tool classifies agricultural sensitivity according to only two independent criteria – the land capability rating and whether the land is used for cropland or not.
In terms of the first criterion, 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, based on its soil, climate and terrain. The higher land capability values (≥8 to 15) are likely to be suitable as arable land for crop production, while lower values are only likely to be suitable as non-arable grazing land.

In terms of the second criterion, all croplands are classified as at least high sensitivity by the Screening Tool based on the logic that if land is used for crop production, it is suitable for it, irrespective of the land capability rating. In addition, all arable land that can support viable crop production is classified as either high or very high sensitivity, as there is a scarcity of arable production land in South Africa. Therefore, the conservation of arable land for agricultural use is a priority. Non-arable land which cannot support viable crop production is much less of a priority to conserve for agricultural use and is rated as medium or low agricultural sensitivity.

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.

3.2.4.2 Screening Tool Descriptions and Site Sensitivity Verification

Figure 3.10 and Figure 3.11 illustrate the study area for the WEF and its associated power line corridor in relation to Agricultural Sensitivity as identified by the Screening Tool.

Agricultural Compliance Statement (Appendix G.1) confirms the high, and very high sensitivity rating of the site by the screening tool because of the site's assessed agricultural production potential, current agricultural land use and that the project footprint ranges from low to medium agricultural sensitivity. There are small, isolated patches of cropland within the project boundary. However, these are all in low-lying, flood plains adjacent to water courses and close to farmsteads, and are therefore highly unlikely to be in locations that will be affected by wind farm infrastructure. These croplands are verified as high (croplands) and very high (irrigated) agricultural sensitivity. Note that infrastructure components avoid these croplands, including access roads, which circumvent the croplands.

The screening tool sensitivity of a grid line corridor has very little relevance to the assessment of its agricultural impact because the impact is likely to be negligible, regardless of the agricultural sensitivity of the land which it crosses. Power lines are permitted, in terms of NEMA's agricultural protocol, to cross high and very high sensitivity land and croplands because they have negligible agricultural impact on such land.

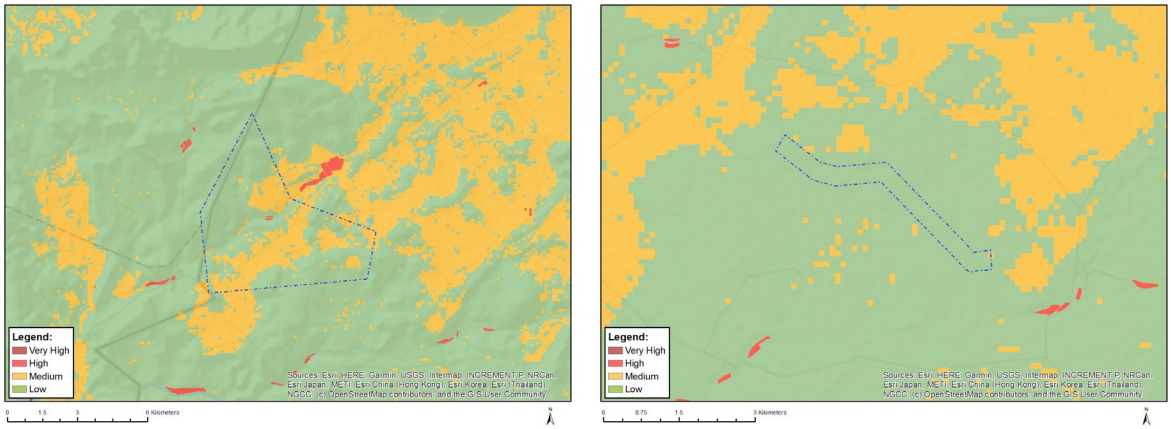


Figure 3.10: The Agricultural Sensitivity of the WEF study area (left) and associated power line corridor (right) based on the Screening Tool (Source: Screening Tool, 2023).

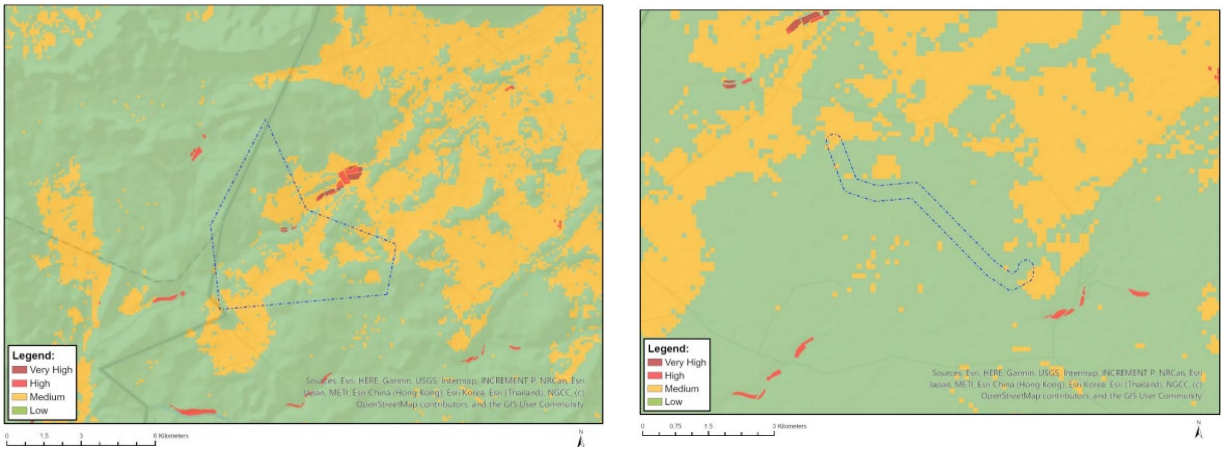


Figure 3.11: The Agricultural Sensitivity of the WEF study area (left) and associated power line corridor (right) based on the Screening Tool (Source: Screening Tool, 2025).

Note that the difference between the agricultural sensitivity results from 2023 and 2025 in the screening tool's results are based on the DFFE'S update of the screening tool in 2025. Therefore, additional areas of cropland have been identified during the 2025 update.

Moreover, the specialist has confirmed that the findings of the specialist inputs to the Final Scoping Report, and the SSV included in the Final Scoping Report, are still valid and the environmental context has not changed.

3.2.5 Aquatic Biodiversity

The information described below is based on EIA level inputs provided by the Aquatic Biodiversity Specialist, which are included in Appendix G.3 of this EIA Report. The proposed WEF was assessed in terms of its aquatic biodiversity sensitivity by means of a desktop analysis using available aquatic ecosystem mapping, aerial imagery and a site visit was undertaken on 17 December 2022 and 23 January 2023. A further site visit in the EIA Phase is not deemed necessary as it is expected that the conditions on site have not changed significantly.

3.2.5.1 General Context

The WEF study area is located in the upper reaches of several tributaries of the Sak River Tertiary Catchment (D55A) of the Lower Orange River System. The tributaries drain south and westwards to join the Sak River. The site lies on low hills to the north-west of the Skurweberg. Table 3.2 provides an overview and summary of the water resource information for the study area.

Table 3.2: Key water resources information for the proposed project development area

Descriptor	Name / details	Notes
Water Management Area (WMA)	Lower Orange WMA	
Catchment Area	Unnamed tributaries of the Sak River	Lower Orange Catchment
Tertiary Catchment	Sak River (D55A)	
Present Ecological state	Elandsfontein: C (moderately modified)	DWS (2012) for the Elandsfontein tributary of the Sak River
Ecological Importance (EI) and Ecological Sensitivity (ES)	Elandsfontein: Moderate EI and low ES	
Type of water resources	Elandsfontein: C (moderately modified)	
Recommended Ecological Condition (REC)	Ephemeral streams	

The study area is mostly drained by smaller seasonal streams which drain towards the Elandsfontein River that then drain south-westwards towards the Sak River. Some instream valley-floor wetland areas are associated with the larger Elandsfontein Tributary. The watercourses are ephemeral to seasonally flowing. The substrate tends to comprise shallow gravel and sand on bedrock while the vegetation is largely terrestrial. Some instream aquatic vegetation occurs where the rivers are more regularly inundated. The watercourses are still in a natural ecological condition with little to no disturbance. Where the watercourses have been disturbed the impact tends to be fairly localised.

Strategic Water Source Areas

Strategic Water Source Areas (SWSAs) are defined[13] 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).

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

[13] Le Maitre et al., 2018:1 in Department of Environment, Forestry and Fisheries (DEFF), 2019. Strategic Environmental Assessment for the Development of a Phased Gas Pipeline Network in South Africa. CSIR Report Number: CSIR/SPLA/EMS/ER/2019/0077/B. ISBN Number: ISBN 978-0-7988-5649-2. Stellenbosch and Durban.

land surface of South Africa. They also include transboundary Water Source Areas that extend into Lesotho and Swaziland.

The proposed project is located approximately 20 km to the south of the Loxton groundwater SWSA and approximately 45 km north of the Beaufort West groundwater SWSA (Figure 3.12). The Nuweveld surface water SWSA is located 36 km southeast of the proposed project. The proposed project will not impact on the SWSAs.

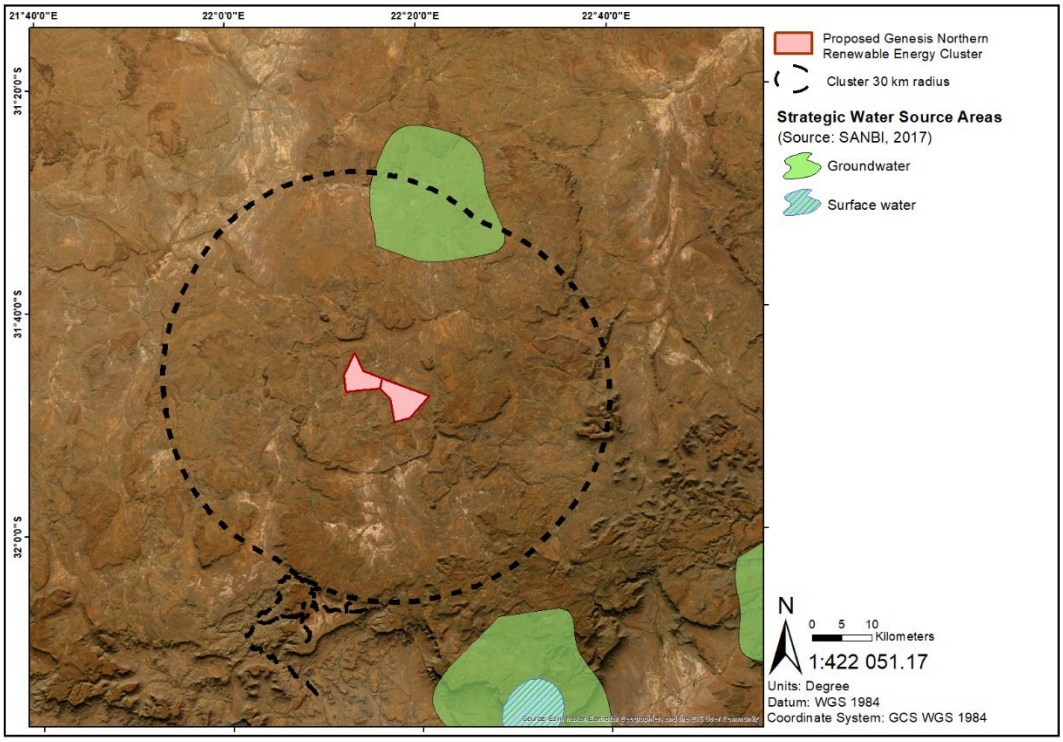


Figure 3.12: Strategic Water Source Areas within 30 km of the GEED Southern Renewable Energy Cluster.

Aquatic Habitat and Species of Concern

Vegetation along the larger watercourses comprises *Lycium*-dominated shrubland with *Asclepias fruticosa* in the wetter areas and *Sporobolus, Stipagrostis* and *Erogrostis* grasses in the sandy watercourse channels. Most of the vegetation associated with the aquatic features within the valley floors in the study area is still largely natural. There is a low density of invasive alien plants such as *Opuntia* spp. occurring in the more disturbed aquatic habitats.

The watercourses in the study area are non-perennial. As a result, there are no records of indigenous fishes occurring in the upper Sak River System. The amphibian diversity within the study area is also likely to be relatively low. No species of conservation concern are thus known to occur in the study area from an aquatic perspective. The amphibian species likely to be present are quite widespread and of low conservation concern. These include the Karoo Dainty Frog *Cacosternum karooicum* (Data Deficient), Poynton's River Frog *Amietia poyntoni*, the Cape Sand Frog, *Tomopterna delalandii,* Pygmy Toad *Poyntonophrynus vertebralis* and the Karoo Toad, *Vandijkophrynus gariepensis*. The latter two amphibian species are listed as "Least Concern".

A faunal species potentially in the area and associated with the watercourses in the landscape is the Riverine Rabbit, which is listed as Critically Endangered. The habitat preference of Riverine Rabbits is alluvial seasonal watercourses, browsing on Pteronia erythrochaetha, Kochia pubescens, Salsola glabrescens and Mesembryanthemaceae. They are unable to survive in heavily overgrazed or agriculturally transformed habitats. No Riverine Rabbit were observed within the study area during the Aquatic Specialist's site verification visits.

3.2.5.2 Screening Tool Descriptions and Site Sensitivity Verification

Figure 3.13 and Figure 3.14 illustrate the study area for the WEF and associated power line corridor in relation to Aquatic Biodiversity Sensitivity as identified by the Screening Tool.

The 2023 Screening Tool map for the Aquatic Biodiversity Combined Sensitivity at the site (Figure 3.13) indicated most of the wider area to be of low sensitivity, with only the main channels of the larger rivers and some wetland areas within the larger watercourses being mapped as being of very high sensitivity. This was linked to aquatic CBAs that are associated with larger rivers that contain instream wetland habitat. The smaller watercourses within the project area are mapped as aquatic ESAs in the 2023 WCBSP and were not highlighted as being of very high sensitivity. The only mapped natural FEPA Wetlands in the area are artificial wetlands associated with dams. In the National Wetland Map version 5 the lower Elandsfontein River within the site is mapped as riverine wetland. The updated Screening Tool mapping in 2025 included all of the small watercourses previous mapped in the 2023 WCBSP as aquatic ESAs, as being of very high sensitivity (Figure 3.14).

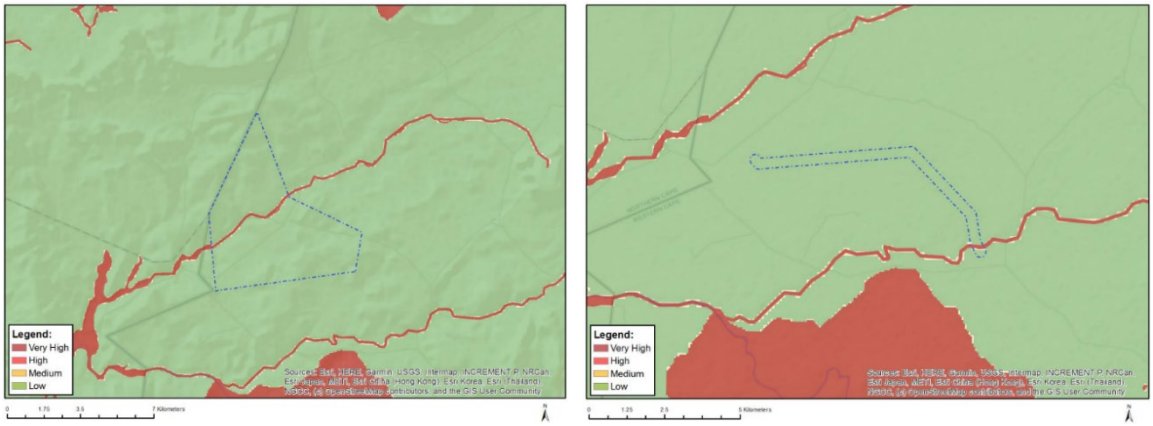


Figure 3.13: Aquatic Biodiversity Sensitivity of the WEF study area (left) and associated power line corridor (right) based on the Screening Tool (Source: DFFE Screening Tool, 2023).

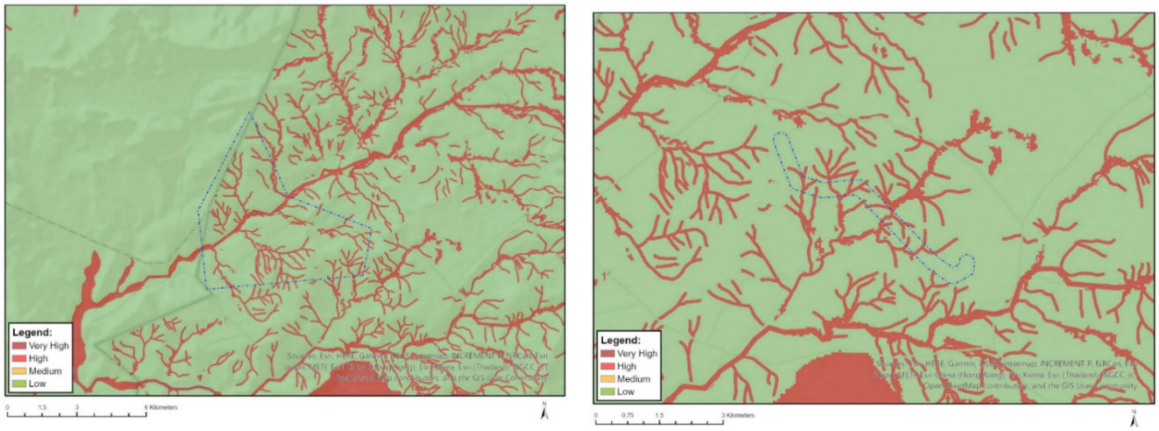


Figure 3.14: Aquatic Biodiversity Sensitivity of the WEF study area (left) and associated power line corridor (right) based on the Screening Tool (Source: DFFE Screening Tool, 2025).

From a specialist reporting perspective, it is confirmed that the findings of the specialist inputs to the Final Scoping Report, and the Site Sensitivity Verification included in the Final Scoping Report, are still valid and the environmental context has not changed in terms of aquatic biodiversity.

The recommended buffer area between the aquatic features and the project components is 35m from the centre of the smaller streams or along the delineated edge of the valley bottom areas associated with the streams, whichever is furthest. The mapped aquatic features and recommended buffers are shown in Figure 3.15.

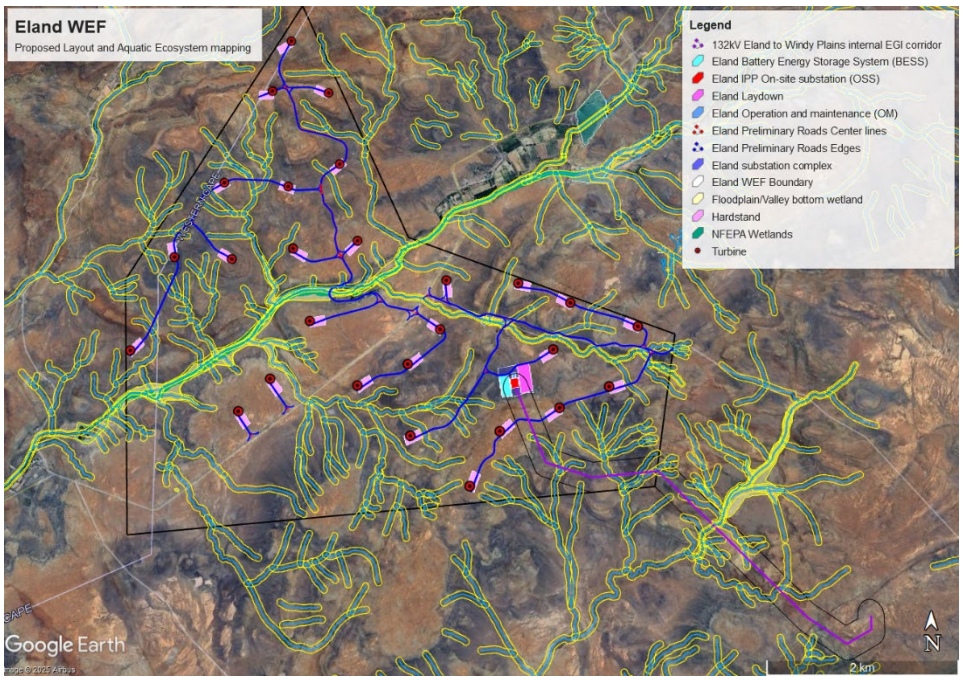


Figure 3.15: Google Earth image of the proposed renewable energy development and the associated aquatic ecosystem constraints (recommended buffers as the yellow areas). (Source: T Belcher, 2025 Appendix G.3).

The no-go area is associated with the larger watercourses and wetlands as an area of high aquatic sensitivity that should be avoided. The smaller tributaries and the recommended buffers for all the watercourses are of medium sensitivity. The buffer areas are areas of protection recommended as a development setback for the WEF that are intended to reduce the edge effect and direct impacts on the integrity and functionality of the aquatic ecosystems. Figure 3.15 indicates the aquatic sensitivity layers and their associated recommended buffers for the proposed project, based on the site verification assessment undertaken. The medium sensitivity (orange areas) should be avoided where possible, or in the case of the new service tracks, adequately mitigated as stipulated in Aquatic Biodiversity and Species Assessment (Appendix G.3 of this EIA Report).

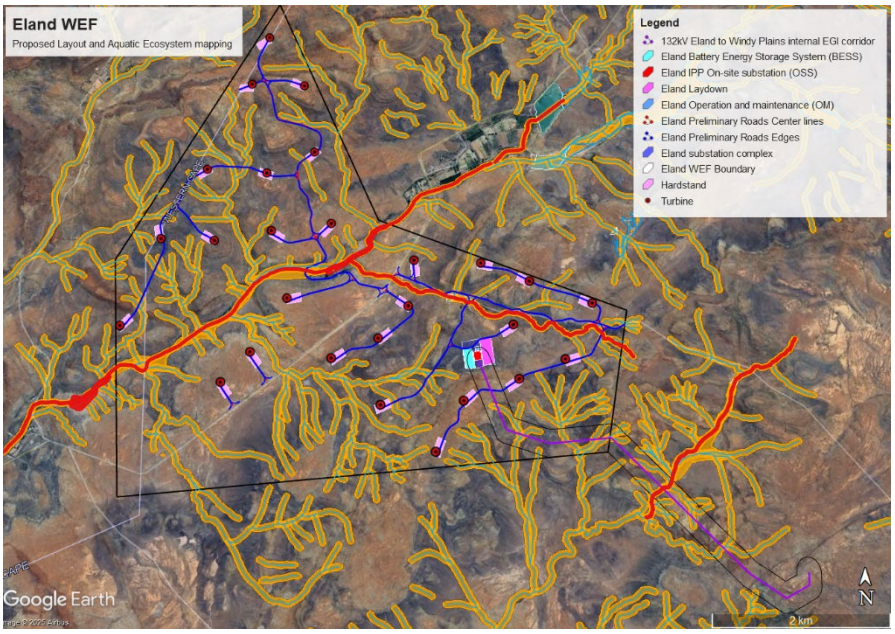


Figure 3.16: Google Earth image showing the aquatic ecosystem sensitivity mapping for the proposed project. The areas of high aquatic sensitivity should be treated as no-go areas for non-linear hardened areas (including turbine foundations, auxiliary buildings, BESS, substation complex, etc.), whereas the areas of medium sensitivity should be avoided but can be developed with mitigation. Service roads and grid connection lines can be constructed in high-sensitivity areas but must be adequately mitigated as stipulated in this report. (Source: T Belcher, 2025 Appendix G.3).

The Aquatic Biodiversity and Species Assessment (Appendix G.3 of this EIA Report) therefore disputes some of the Aquatic Biodiversity Combined Sensitivity classification by the Screening Tool. The smaller tributaries and watercourses are considered of medium sensitivity - as opposed to very high aquatic ecosystem sensitivity - as is currently (July 2025) and previously (March 2023) mapped in the Screening Tool. Additionally, this assessment confirms that the larger Elandsfontein Tributary is of very high aquatic ecosystem sensitivity.

3.2.6 Terrestrial Biodiversity

The information described below is based on EIA level inputs provided by the Terrestrial Specialist, which is included in Appendix G.2 of this EIA Report.

Desktop and GIS Survey

A desktop and GIS-based survey was conducted to assess how the proposed WEF layout interacts with key terrestrial biodiversity features. Spatial data were integrated in QGIS using sources such as the Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2024), Western Cape (2023) and Northern Cape (2024) Biodiversity Spatial Plans, the Red List of Ecosystems (SANBI, 2022a & b), and the SAPAD and SACAD databases. Additional data were obtained from iNaturalist and other citizen science platforms. For flora, the Red List of South African Plants was used to identify Threatened and Species of Conservation Concern (SCC). For fauna, spatial and biodiversity databases and key literature, including Branch (1998), Tolley et al. (2023), Du Preez & Carruthers (2017), Child et al. (2016), and Skinner & Chimimba (2005), were consulted, with supplementary records sourced from ReptileMAP, MammalMAP, and FrogMAP (2024).

Previous Surveys by 3Foxes Biodiversity Solutions (2022)

The Northern Cluster site was visited on two occasions for the current study, from 28-29 June 2022 and 7-8 September 2022. During the site visits, the different biodiversity features, habitat, and landscape units present at the site were identified and mapped in the field. Specific features visible on the satellite imagery of the site were also marked for field inspection and were verified and assessed during the site visit.

During the field assessment, the site was extensively investigated in the field. Walk-through surveys were conducted within different landscape units and habitat types and particular attention was paid to areas deemed potentially sensitive such as rocky outcrops, areas of rock pavement and drainage features. Reference Sample sites were located within the Eland site in which a reference photograph and GPS location were taken and a full plant species list for an area of approximately 20x20m as pictured in the foreground of the photograph. A full species list for the site was also developed.

Current Survey by Bios Diversitas Consultants (2025)

As per the CSIR and GEEDs request, a site sensitivity verification survey was undertaken from 10-14 May 2025 by a SACNASP registered ecologist where the terrestrial biodiversity including sensitive plant and animal species of the study area was evaluated. During the field survey performed, the area was evaluated on foot, and a series of georeferenced photographs were taken.

3.2.6.1 Regional Vegetation

The entire WEF site is broadly classified as falling within the Eastern Upper Karoo vegetation type listed as Least Concern as indicated in Figure 3.17(Mucina & Rutherford, 2006; Red List of Ecosystems (RLE), 2022; VEGMAP, 2024). However, this classification oversimplifies the site's actual vegetation diversity. Field assessments conducted on-site indicate the presence of distinct patches of Upper Karoo Hardeveld, along with extensive areas of riparian vegetation mapped as part of the Bushmanland Vloere vegetation type.

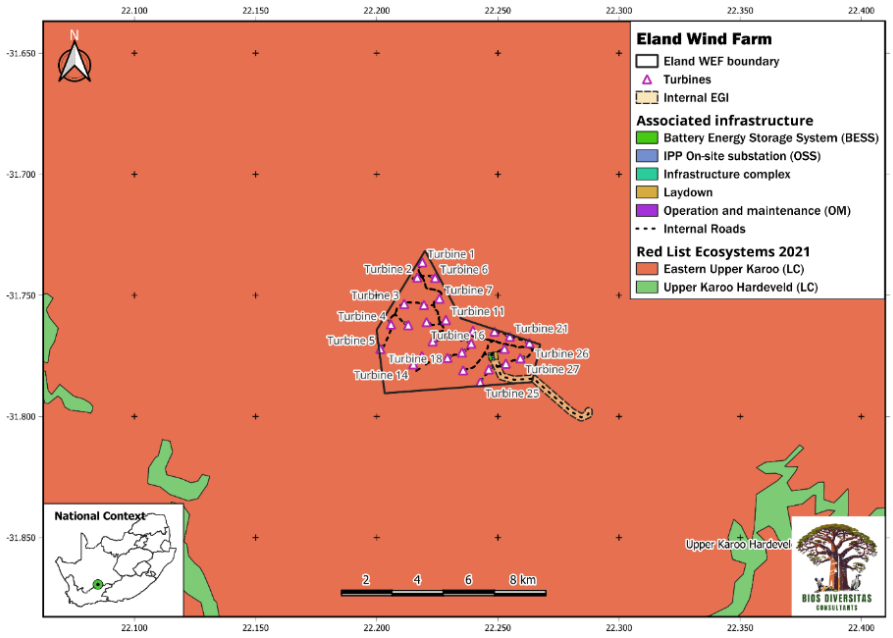


Figure 3.17. The proposed WEF in relation to the National Vegetation Map (SANBI, 2024) and terrestrial Red List Ecosystems (RLE, 2022) (Source: Bios Diversitas Consultants, 2025).

3.2.6.2 Protected Areas, Expansion Areas and Key Biodiversity Areas

The proposed WEF development is located in the Upper Karoo Key Biodiversity Area (KBA). It is not located within a Protected Area (PA), the closest being the Karoo National Park but a small section to the west is located in a National Protected Area Expansion Strategy (NPAES) focus areas Figure 3.18.

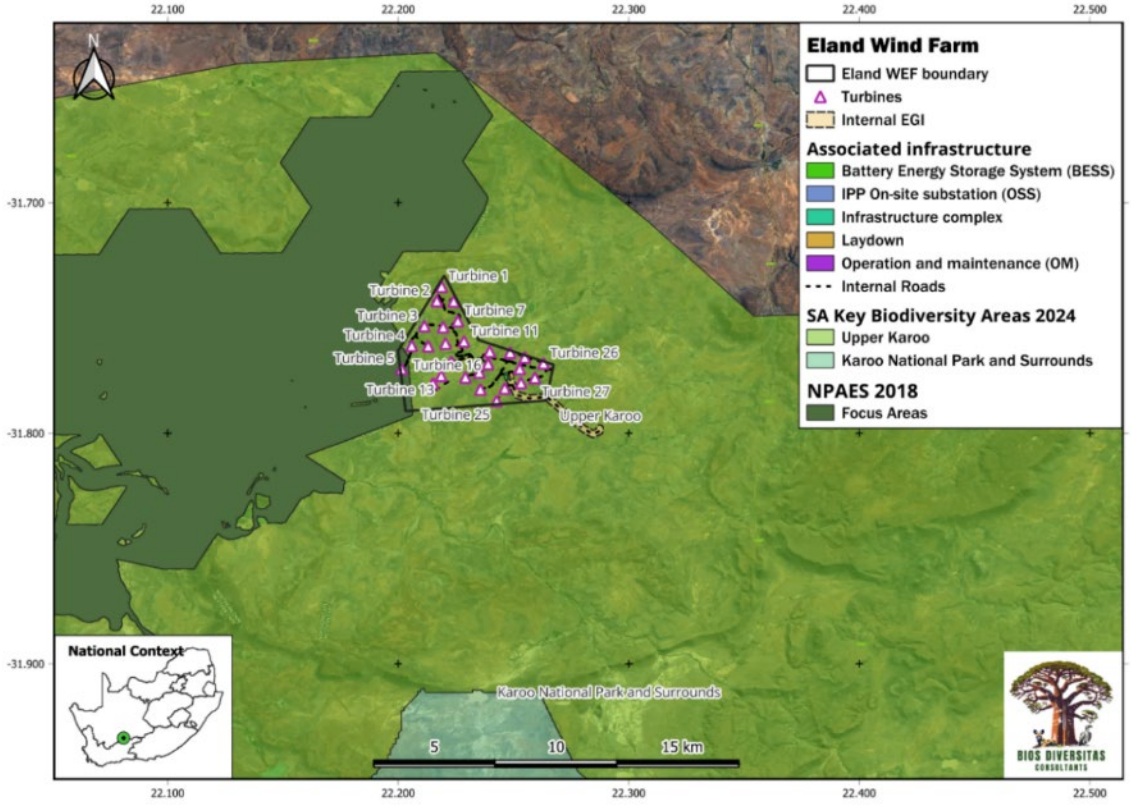


Figure 3.18. Protected and Key Biodiversity Areas in relation to the proposed WEF (Source: Bios Diversitas Consultants, 2025).

National Protected Area Expansion Strategy

The goal of the NPAES is to achieve cost effective protected area expansion for improved ecosystem representation, ecological sustainability and resilience to climate change. It sets protected area targets, maps priority areas for protected area expansion, and makes recommendations on mechanisms to achieve this. This is particularly important in the context of South Africa's globally exceptional biodiversity richness on the one hand, and significant financial

Only Turbine 5 of the proposed Eland WEF intersects with the NPAES, which is minor within the larger landscape. Accordingly, a single turbine position will not have a impact on the NPAES.

Upper Karoo Key Biodiversity Area (KBA)

Upper Karoo is a very large terrestrial site[14] that is unprotected, found in the Northern Cape, South Africa (Table 3.3). This site qualifies as a KBA of international significance that meets the thresholds for 3 criteria described in the Global Standard for the Identification of KBAs. Based on current available information, 7 species meet one or more KBA criteria for this site. The WEF footprint covers ~ 0,0128 % of the total Upper Karoo KBA.

[14] In this section, the term “site” refers to the KBA (and not the Eland WEF project site).

Table 3.3: Overview of the Upper Karoo Key Biodiversity Area.

Site overview	
National site name	Upper Karoo
Central coordinates	Latitude -31.8000, Longitude 22.1430
KBA status	Confirmed
Global KBA criteria	A1a, A1c, A1d, B1, B4, E
Year of last assessment	2024
System	terrestrial, freshwater
Elevation (m)	1011 to 1733
Area of KBA (km²)	10109.14315
Protected area coverage (%)	0.01
KBA classification	Global
Legacy site	No

3.2.6.3 Provincial Biodiversity Spatial Plans

The proposed Eland WEF is located in both the Western and Northern Cape provinces. Accordingly, both the 2023 Western Cape Biodiversity Spatial Plan (WC BSP) and 2024 Northern Cape Biodiversity Spatial Plan (NC BSP) is applicable (Figure 3.19).

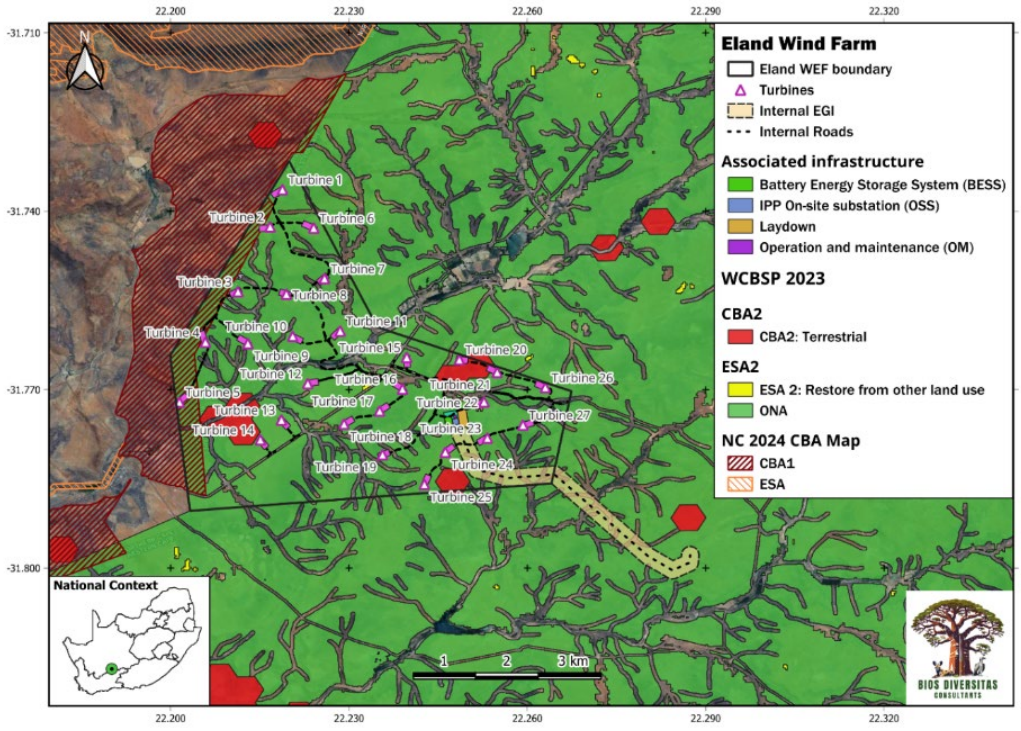


Figure 3.19. The proposed WEF in relation to the 2023 Western Cape Biodiversity Spatial Plan and the 2024 Northern Cape Biodiversity Spatial Plan (Source: Bios Diversitas Consultants, 2025)

2023 Western Cape Biodiversity Spatial Plan (WC BSP)

The WC BSP indicates that the majority of the study area is mainly located within Other Natural Areas (ONA) with ESA 2 terrestrial features interspersed throughout the landscape and some areas of terrestrial CBA 2, which differ from the 2017 WC BSP (Figure 3.19). There are no turbines

located in the terrestrial CBA 2, but sections of two turbine hardstands (numbers 20 and 21) intersect with it. Micrositing should be considered for these two turbines to avoid the CBAs.

Northern Cape Biodiversity Spatial Plan (NC BSP)
The NC BSP indicates that the western boundary of the study area is located within a CBA 1 with small sections of the site located in ONA (Figure 3.19). The NC BSP CBA 1 is owing to the presence of threatened mammal and threatened tortoise, whereas the WC BSP indicates this same area as only ONAs. This highlights the disjoint between provincial BSPs as the provincial boundary is an arbitrary line which is not considered by animals, and accordingly, this complicates the conservation of threatened species and furthermore, it complicates land-use decision-making across borders where in one case threatened species are considered within conservation planning and in the other case the threat status of the species has been significantly reduced within the landscape.

For the Eland WEF:

- Turbine 5 and Hardstand 5 are fully located within the CBA 1, while Hardstands 2 and 4 are partially located within the CBA 1. Approximately 1 km of road is also included in CBA 1.
- Micrositing of these facilities, especially Turbine and Hardstand 5 should be considered, as well as for the other facilities.
- Turbine 1 and Hardstand 1 is located within ONA. This is not considered a significant impact and no further action is required.

3.2.6.4 Faunal Communities

As many as 70 mammals are listed for the wider study area in the MammalMap database, but many of these are introduced or conservation-dependent and approximately 48 can be considered free-roaming and potentially impacted by the development. This includes several red-listed species including the Riverine Rabbit *Bunolagus monticularis* (CR), Black-footed Cat *Felis nigripes* (VU), Grey Rhebok *Pelea capreolus* (NT), Mountain Reedbuck *Redunca fulvorufula* (EN) and Brown Hyena *Hyaena brunnea* (NT).

The DFFE Screening Tool identified the Karoo Dwarf Tortoise and Riverine Rabbit as being of potential concern at the site. Based on the camera trapping conducted within the site by 3Foxes Biodiversity and for the nearby Hoogland Wind Farms, only the Riverine Rabbit was considered likely to be present in the area at the time of the SSV and Scoping Report. However, based on records from the Nuweveld East WEF and iNaturalist records *R. fulvorufula fulvorufula* have been recorded in the area and is likely to be present within the study area.

Refer to the Environmental Management Programme (EMPr) (Appendix H.1 of this EIA Report) for mitigation measures minimising the impacts on SCC.

Riverine Rabbit Bunolagus monticularis – Critically Endangered
The current assessment suggests that the Riverine Rabbit should, under a precautionary purview, remain listed as Critically Endangered C2a(i) due to its inferred small population size and inferred continuing decline from habitat loss and degradation, including ongoing loss of mature individuals. The species is also protected under schedules 1 of section 62 of the Nature Conservation Ordinance in the Western Cape and the Northern Cape Nature Conservation Act (2009).

With the current design measures and integration of riparian buffer zones into the turbine exclusion layer, the proposed WEF is unlikely to have a significant residual impact on Riverine Rabbit habitat. Ongoing monitoring and strict adherence to buffer protections will be critical to ensure the long-term conservation of this species within the development footprint.

Karoo Dwarf Tortoise Chersobius boulengeri – Endangered

Chersobius boulengeri (Karoo Dwarf Tortoise) is a species of high conservation concern. It is listed on CITES Appendix II (as part of Testudinidae spp.) and is legally protected in South Africa under provincial nature conservation ordinances and biodiversity legislation. The species is assessed as Endangered according to the IUCN Red List (criterion A4ace), with evidence indicating a population decline of approximately 30% over the past 25 years (one generation), coupled with a projected decline of at least 30% over the next 50 years (two generations). This results in an anticipated overall reduction of ~60% across three generations.

With the application of no-go areas, careful micro-siting, and strict environmental controls, the potential residual impacts on *Chersobius boulengeri* are expected to be low in significance. However, ongoing monitoring and adaptive management will be essential to ensure that the WEF development does not exacerbate the species' already declining population trend.

Southern Mountain Reedbuck Redunca fulvorufula fulvorufula – Endangered

The presence of the Mountain Reedbuck (*Redunca fulvorufula*) on the adjacent Nuweveld WEF site is of ecological and conservation significance. This antelope species is currently listed as Endangered A2b in South Africa, with evidence of a marked decline of approximately 61% in monitored populations within formally protected areas between 1998 and 2013. National population estimates range between 15,000 and 33,000 individuals, although robust data for populations on private and unprotected land remain limited, and these areas are poorly monitored.

Although the Mountain Reedbuck is an Endangered species of national concern, the local population at the WEF is considered to be small and relatively dispersed. Impacts are expected to be temporary and primarily confined to the construction phase. Given the species' known behavioural ecology, Mountain Reedbuck are expected to return to the site during the operational phase once disturbance subsides. With implementation of the recommended mitigation measures, the residual impact significance is assessed as low.

Psammobates tentorius ssp. verroxii Northern Tent Tortoise – Near Threatened

Psammobates tentorius verroxii, commonly known as the Northern Tent Tortoise, is a subspecies of the Tent Tortoise found in arid and semi-arid regions of South Africa. It is typically associated with sparsely vegetated open shrublands, gravel plains, and low rocky outcrops where it finds shelter under shrubs, in burrows, or beneath rocks. The species relies on a mosaic of microhabitats that provide both food (primarily succulent and herbaceous plants) and protection from predators and extreme temperatures.

P. t. verroxii is considered near threatened in parts of its range, largely due to habitat degradation, illegal collection, road mortality, and infrastructure development. With careful planning, avoidance of key habitat areas, and ongoing monitoring, the impacts of wind energy developments on *Psammobates tentorius verroxii* can be significantly reduced. This approach contributes to both biodiversity conservation and the responsible development of renewable energy infrastructure

3.2.6.5 Screening Tool Descriptions and Site Sensitivity Verification

Figure 3.20 to Figure 3.25 illustrate the study area for the WEF and associated power line corridor in relation to Terrestrial Plant Species, Terrestrial Animal Species, and Terrestrial Biodiversity Sensitivity as identified by the Screening Tool.

Plant Species

Figure 3.20 and Figure 3.21, and shows that there are no known species of conservation concern that are likely to occur in the area. There are no known SCC that are likely to occur in the area. This agrees with the results of the SSV undertaken which found no plant SCC within the site or nearby area. The Plant Species Theme sensitivity, based on the 2025 STR, is indicated as low based as no species has been recorded or are expected to be recorded based on suitable habitat within the study area. This is consistent with the findings of the SSV and Scoping Phase as well as this one undertaken in 2025, which confirmed the absence of any plant SCC within the site or surrounding area. However, within the broader region (<10 km radius) at least two plant SCC (one Rare and one Vulnerable species) have been recorded, but the habitat on site seems to be absent. Accordingly, only a compliance statement is required as the sensitivity is considered to be medium (i.e. where no SCC are found on site during the investigation or if the presence is confirmed to be unlikely).

Figure 3.20: Terrestrial Plant Species sensitivity of the WEF study area (left) and associated power line corridor (right) based on the Screening Tool (Source: Screening Tool, 2023).

Figure 3.21: Terrestrial Plant Species sensitivity of the WEF study area (left) and associated power line corridor (right) based on the Screening Tool (Source: Screening Tool, 2025).

Note that the Screening Tool map is unchanged. Moreover, the specialist has confirmed that the findings of the specialist inputs to the Final Scoping Report, and the SSV included in the Final Scoping Report, are still valid and the environmental context has not changed.

Animal Species

The animal species theme sensitivity map is illustrated below in Figure 3.22 and Figure 3.23 and shows that the WEF study area and associated power line corridor is classified as Medium sensitivity for avifauna and for terrestrial fauna. Refer to Section 3.2.8 of this chapter for the EIA-level assessment and Site Sensitivity Verification for avifaunal species. The medium sensitivity for terrestrial fauna is due to the potential presence of the Riverine Rabbit (*Bunolagus monticularis*) and Karoo Dwarf Tortoise (*Chersobius boulengeri*). The SSV site visit confirmed that the site contains areas of suitable habitat for the Karoo Dwarf Tortoise as well as for the Riverine Rabbit where some suitable habitat along the Sak River is present. In addition, there are confirmed sightings of this species from within the Eland site with the result that it can be confirmed present.

Apart from the species listed above by the screening tool, there are several additional fauna species of concern that are either confirmed present in the area such as the Mountain Reedbuck, or potentially present in the general area including the Black-footed Cat (Felis nigripes) (VU), Grey Rhebok (Pelea capreolus) (NT), and Brown Hyena (Hyaena brunnea) (NT).

The 2025 site survey confirmed the presence of suitable habitat for both species, in addition to other animal SCC. The Karoo Dwarf Tortoise is known to occur in the broader region and suitable habitat is present on rocky slopes - making its presence within the WEF site likely. The Riverine Rabbit, typically associated with the silty floodplains of ephemeral rivers in the Upper Karoo, may also occur in the area, with some suitable habitat identified along the Sak River where it traverses the WEF site. The Medium sensitivity (listed below) is disputed as High owing to suitable habitat for an Endangered and Critically Endangered species, as well as the presence of a Near Threatened reptile species. Accordingly, a Terrestrial Animal Species Assessment must be conducted based on the Protocols (published on GN 1150 on 30 October 2020, amended based on GN 3717 on 28 July 2023).

Figure 3.22: Terrestrial Animal Species sensitivity of the WEF study area (left) and associated power line corridor (right) (Source: Screening Tool, 2023).

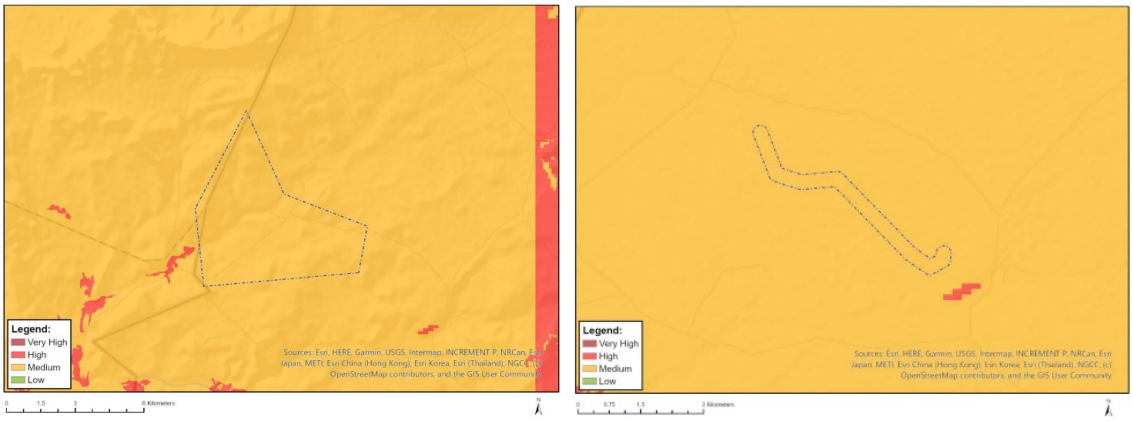


Figure 3.23: Terrestrial Animal Species sensitivity of the WEF study area (left) and associated power line corridor (right) (Source: Screening Tool, 2025).

Note that the Screening Tool map is unchanged. Moreover, the specialist has confirmed that the findings of the specialist inputs to the Final Scoping Report, and the SSV included in the Final Scoping Report, are still valid and the environmental context has not changed.

Terrestrial Biodiversity

The terrestrial biodiversity theme is illustrated below in Figure 3.24 and Figure 3.25 and illustrates that small portions of the WEF study area is mapped as Very High while the majority is mapped as Low sensitivity. The power line corridor is mapped as Low sensitivity. The Very High sensitivity is due the site slightly encroaching onto a CBA along the boundary of the farm, encroaching over the Northern Cape provincial border. Apart from that, there is a smaller CBA along the Elandsfontein se Rivier and the minor drainage features of the site are mapped as ESAs. There is a National Protected Area Expansion Strategy (NPAES) Focus Area within the Northern Cape, and which cuts slightly into the site along the western boundary of the site. The very high sensitivities depicted in the 2023 Screening Tool Report were based on the following Sensitivity Feature(s): CBA 1, ESA 2, NPAES Focus Area.

The Terrestrial Biodiversity Theme sensitivity for the Eland WEF, based on the 2025 STR, is indicated as Very High owing to the sensitivity features indicated below. The rating is similar to the

2023 Screening Tool Report, but the features differ slightly owing to changes in the 2024 Northern Cape - and 2023 Western Cape Biodiversity Sector Plans.

The western boundary of the site falls within a small section of the Northern Cape where the area was mapped as CBA1 for Threatened mammal and Threatened tortoise, whereas the adjoining area on the Western Cape side is indicated as other natural areas (ONAs) with smaller areas indicated as CBA2: Degraded and ESA2: Restore which should be maintained in a functional, near-natural state. Accordingly, the Very High sensitivity for some features on site is confirmed and a Terrestrial Biodiversity Specialist Assessment must be conducted based on the Protocols (published on GN 320 on 20 March 2020). The Very High sensitivities depicted in the 2025 STR are listed below:

- CBA 1 (Northern Cape)
- CBA 2: Terrestrial (Western Cape)
- ESA 2: Restore from other land use (Western Cape)
- NPAES Focus Area

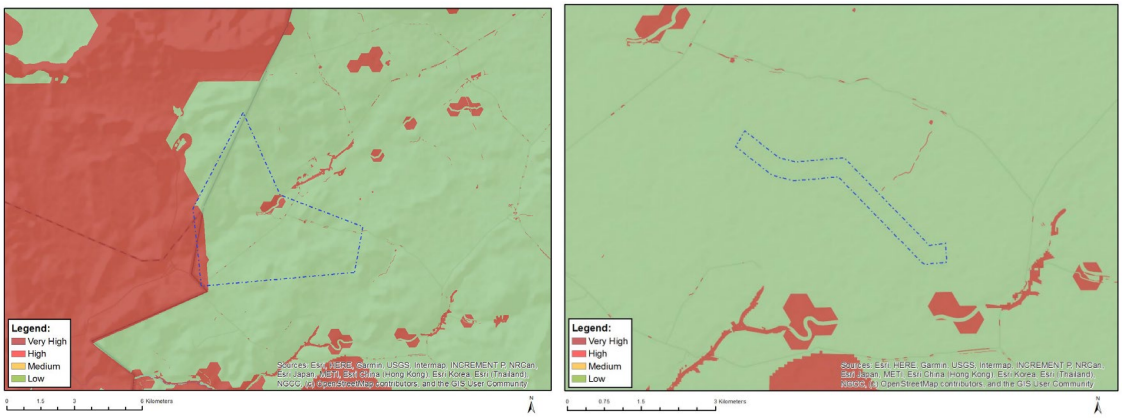


Figure 3.24: Terrestrial Biodiversity Sensitivity of the WEF study area (left) and associated power line corridor (right) (Source: Screening Tool, 2023).

Figure 3.25: Terrestrial Biodiversity Sensitivity of the WEF study area (left) and associated power line corridor (right) (Source: Screening Tool, 2025).

Moreover, the specialist has confirmed that the findings of the specialist inputs to the Final Scoping Report, and the SSV included in the Final Scoping Report, are still valid and the environmental context has not changed.

3.2.6.6 Site Sensitivity

Following the site inspection and based on detailed mapping and local site conditions, including the findings of the SEI, the specialists undertook more detailed sensitivity mapping (at the project scale) for the proposed project.

The species protocol guidelines (SANBI 2020) prescribe recommended buffers around habitats utilised by species of conservation concern. For C*. boulengeri*, the prescribed buffer around sensitive rocky habitats is a minimum of 300 m. Foraging habitats for these species are usually not exclusively confined within the rocky habitats, and therefore large buffers are required to ensure appropriate foraging requirements are met. In addition, these rocky habitats tend to occur patchily in the landscape, and therefore large buffers must be applied in order to ensure habitat connectivity. However, rigid application of the 300 m minimum buffer is not considered necessary for this type of development and the habitat delineation with a 50 m buffer is considered sufficient to indicate Very High SEI habitats that must be avoided, but only if all other mitigation measures are applied.

The sensitivity and constraints analysis identified several key environmental constraints across the project site. These include:

- Drainage features and associated riparian habitats (suitable for Riverine Rabbit).
- Applied habitat buffers linked to Riverine Rabbit sensitivity.
- Steep slopes and dolerite outcrops, which provide sensitive habitats for species such as the Karoo Dwarf Tortoise (*Chersobius boulengeri*).
- CBAs representing natural vegetation, ecosystem services and sensitive animal species.

The sensitivity maps generated (Figure 3.26 and Figure 3.27) are based on the following:

Very High sensitivity features

- These include Watercourses, Rocky Ridges, Dams and Pans which are No-Go areas for non-linear development, and where linear development should be reduced as far as possible.
- The Rocky Ridges included here are very important for ecological functioning and protecting tortoise SCC, while the Pans are very important habitats with high ecological value in this barren landscape.
- Confirmed CBA1 and CBA2: Where suitable habitat for SCC was mapped and sensitive features and species confirmed within the landscape, it was included. Accordingly, the entire CBA1 (NC BSP) extent overlapping the study area to the west, and the smaller CBA2 (WC BSP) polygons embedded within the site, was not included in this category but rather refined based on available data. Considering the precautionary approach, it is still important for all non-linear infrastructure to avoid the CBA1, especially since the proposed development footprint at this location could not be surveyed during the 2025 period. The CBA2, on the other hand, has been reworked into the sensitivity map based on site sensitivity verification.

High sensitivity features

- These include Rocky Ridges which are important for ecological functioning and protecting tortoise SCC.

Medium sensitivity features

- Watercourse features not included as very high sensitivity, including seeps and non-perennial drainage lines which feed into the larger system.

Low sensitivity features

- Even though the Karroid Shrubland (and associated grassland) SEI sensitivity is indicated as medium, the large extent of this area and considering the type of development (wind farm and not a solar farm), reduces the sensitivity to low as only a small portion will be transformed for development.

Although these constraints cover a significant portion of the site, there remain large areas of open plains and low hills that are classified as low to medium sensitivity, and are therefore considered suitable for wind energy development.

In terms of the sensitivity mapping relating more generally to mammals, the larger riparian areas have been classified as Very High sensitivity based on their value as Riverine Rabbit habitat but also as a result of their general ecological significance and ecosystem services. The rocky hills and steep slopes have been classified as Very High sensitivity on account of the value of these areas as habitat for mammals associated with rocky areas and the more general ecological value of these areas. While these features occupy a fairly large proportion of the site, the overall degree of potential conflict between the development and these areas appears to be low.

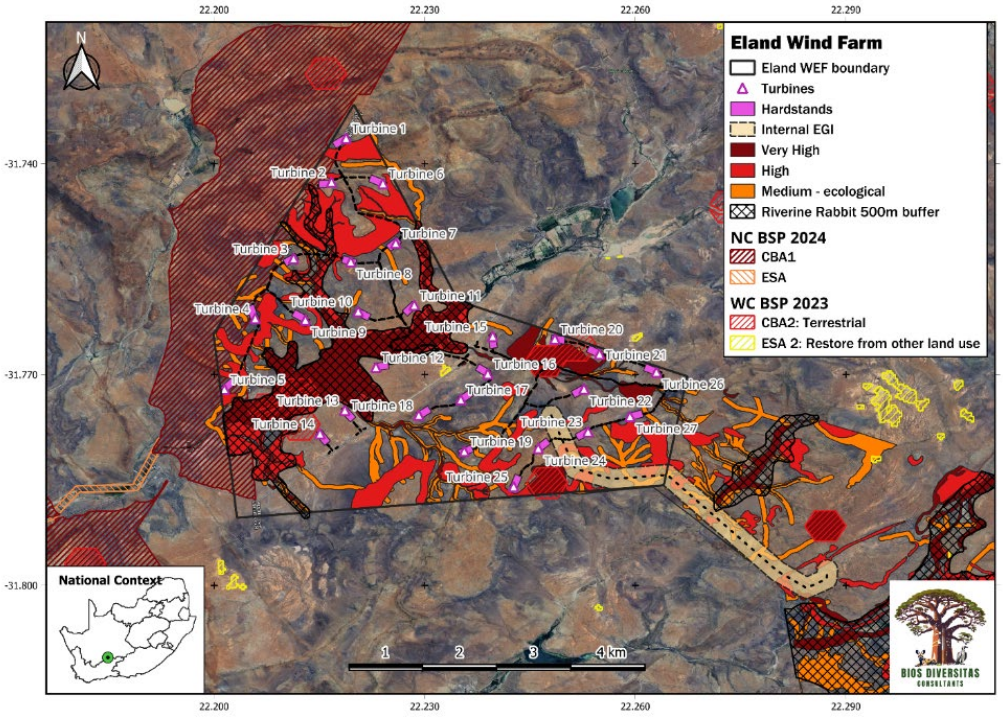


Figure 3.26: Sensitivity map for the proposed Eland WEF and associated infrastructure for identified sensitive features, their associated buffers (where relevant) as well as the provincial CBAs and ESAs (Source: Bios Diversitas Consultants, 2025)

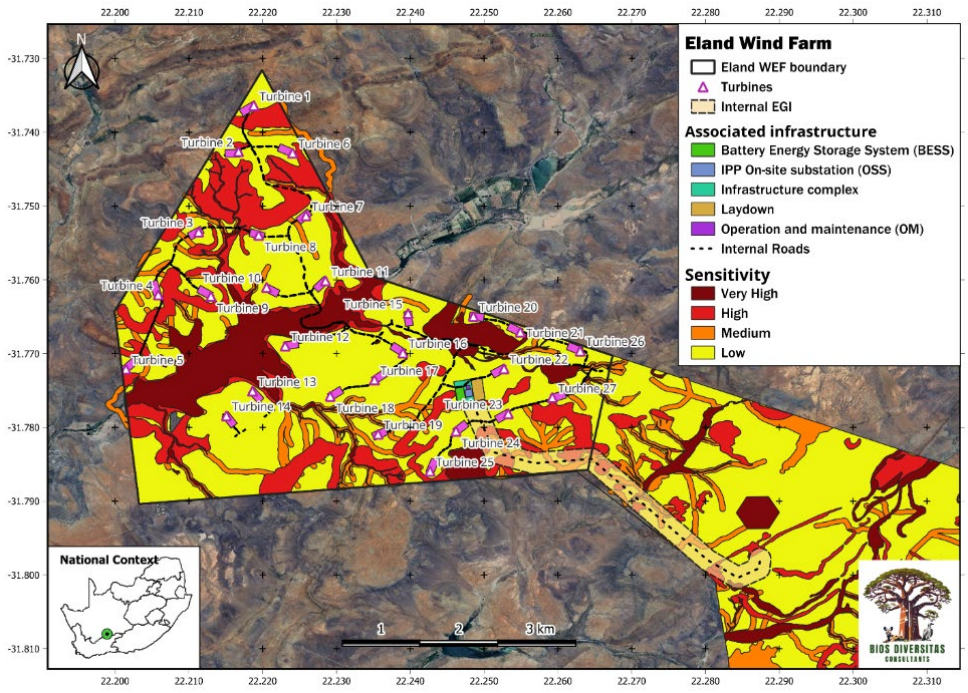


Figure 3.27: Sensitivity map for the proposed Eland WEF and associated infrastructure based on site sensitivity verification and manual delineations (Source: Bios Diversitas Consultants, 2025)

3.2.7 Bats

A detailed description of the bat species encountered within the study area and the potential impact of the proposed WEF development on bats is provided in the Bat Impact Assessment. The information described below is based on EIA level inputs provided by the Bat Specialist, and which are included in Appendix G.12 of this EIA Report.

The pre-construction monitoring was designed to monitor bat activity across the study area earmarked for the proposed development of the proposed WEF project. The baseline environment was investigated by using acoustic monitoring to document bat activity between 30 May 2021 and 26 May 2022 (362 sample nights) and the monitoring was undertaken in accordance with the "*South African Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy Facilities"* (Aronson *et al.,* 2020). The monitoring was undertaken in accordance with South African best practice (Sowler, 2020). Sampling of bat activity was undertaken at seven locations using Song Meter SM4 bat detectors (Wildlife Acoustics, Inc.). An ultrasonic microphone was mounted on a mast at 12 m ("ground level") at all of these locations. Three of these locations are meteorological masts on which microphones were placed at 12 m, 55 m and 110 m (where 55 m and 110 m are "at height"). All detectors were configured to record every night from 30 minutes before sunset until 30 minutes after sunrise. The distribution of monitoring locations across the site was determined based on vegetation types, land-use, and topography with the aim to sample bat activity in areas where bat activity was expected to be higher (e.g. near water, buildings and along riparian vegetation), but also in areas where bat activity was expected to be lower (e.g. away from water and buildings, on top of ridges and in open areas with low habitat complexity). In addition to acoustic monitoring, potential structures that bats could use as roosts were investigated during the day for the presence or evidence of roosting bats (e.g. guano and culled insect remains, etc.) whenever the specialists were on site. Such structures included buildings, rocky outcrops and trees. The structural complexity of the habitat on site is lacking, which corresponds to a lower diversity of bat species and could be the case on the site. There are some suitable habitats for bats that can be used for roosting, foraging and commuting, but no known major bat roosts have been located close to any of these sites.

Approximately ten bat species can potentially occur at the proposed site (African Chiroptera Report 2020; Monadjem et al. 2020). It is possible that more (or fewer) species may be present because the distributions of some bat species in South Africa, particularly rarer species, are poorly known. Analysis of the acoustic monitoring data suggests that at least seven bat species are present (Table 3.4). The sensitivity of each of these species to the project is a function of their conservation status and the likelihood of risk to these species from wind farm development. The likelihood of risk to impacts of wind energy was determined from the guidelines and is based on the foraging and flight ecology of bats and migratory behaviour. The sensitivity of each bat species to the proposed project is a function of their conservation status and the likelihood of risk to these species from the proposed WEF development. Table 3.4 lists the bat species recorded within the study area including their sensitivity to the WEF projects.

Table 3.4: Potential and confirmed bat species recorded within the proposed WEF study area and their sensitivity to WEFs (Source: ERM, 2025)

Species	Species Code	# of Bat Passes	Conservation Status[15]		Likelihood of Risk
			National (2016)	Global	
Egyptian free-tailed bat *Tadarida aegyptiaca*	TADAEG	150,888	Least Concern	Least Concern	**High**
Roberts's flat-headed Bat *Sauromys petrophilus*	SAUPET	728	Least Concern	Least Concern	**High**
Natal long-fingered bat *Miniopterus natalensis*	MINNAT	615	Least Concern	Least Concern	**High**
Cape serotine *Neoromicia capensis*	NEOCAP	8,700	Least Concern	Least Concern	**High**
Long-tailed serotine* *Eptesicus hottentotus*	EPTHOT	720	Least Concern	Least Concern	**Medium**
Lesueur's hairy bat *Cistugo lesueuri*	CISLES	4	Near Threatened	Least Concern	**Low**
Cape horseshoe bat Rhinolophus capensis	RHICAP	1	Near Threatened	Least Concern	**Low**
Egyptian Fruit Bat *Rousettus aegyptiacus*		-	Least Concern	Least Concern	**High**
Temminks hairy bat *Myotis tricolor*		-	Near Threatened	Least Concern	**Medium-High**
Egyptian slit-faced bat *Nycteris thebaica*		-	Least Concern	Least Concern	**Low**

No Bat SCC were found on site during the sampling. Furthermore, the Screening Tool Report animal species theme did not identify any Bat SCC on site. As such, GN 1150 (Animal Species Protocol), published in October 2020, does not apply to this study. Hence this study has been undertaken in compliance with Appendix 6 of the 2014 NEMA EIA Regulations and Part A of the Assessment Protocols published in GN 320 (March 2020).

Bat activity at the proposed WEF area (and the wider GEED Beaufort West Wind Farm area) was high in summer and parts of spring and autumn, moderate for the rest of spring and autumn, and low for winter with regards to the Nama Karoo ecoregion. However, there is lack of structural complexity in the habitat, low evidence of roosts and typically low species diversity for the area, which is characteristic of this ecoregion. The data collected during the monitoring period suggests that the risk to bats posed by the wind energy development at the site is low for clutter-edge bat species and the correct placement of turbines will limit the impact to these species. Free-tailed bats and Cape serotine bats are likely to face the highest risk of impacts due to their prevalence. Sensitive design and mitigation will be needed to reduce risk to these bats. Sensitive areas including those used by bats for foraging, roosting and commuting must be avoided for turbine placement. No turbines, including the blade tips, are allowed within any high sensitivity areas. There are no turbines that currently within high sensitivity zones. The proposed on-site substation location in the current layout is acceptable.

[15] Child, M.F., Roxburgh, L., Do Linh San, E., Raimondo, D., Davies-Mostert, H.T. eds., 2016. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

The choice of turbine design, specifically, the hub height and rotor diameter, should be carefully chosen to reduce potential interactions between bats and turbine blades. The hub-height should be maximized and the blade length should, ideally, not sweep lower than 50 m, as turbines with a lower ground clearance run the risk of reaching the fatality thresholds sooner.

Blade feathering, curtailment and deterrents are the remaining mitigation measures to reduce residual impacts during operation and must be continuously refined and adapted based on incoming bat fatality data. Blade feathering must be implemented as soon as operation begins. An operational monitoring campaign for bats must be implemented and informed by the best practice guidelines, to monitor mortality and bat activity levels. Activity and fatality data should be relayed to an appropriate bat specialist to include in operational monitoring reports and used to refine and update mitigation measures (should mortalities exceed acceptable levels and the curtailment plan.

The data suggests that there could be a risk to bats posed by the Eland wind energy development at the site, particularly in summer and parts of spring and autumn. Despite this, and provided the above considerations are met, the development of proposed WEF compatible with bat conservation.

3.2.7.1 Screening Tool Descriptions and Site Verification

Figure 3.28 illustrates the study area for the WEF in relation to Bat Sensitivity as identified by the Screening Tool. The red areas indicate high bat sensitivity hydrology features due to presence of a wetland, or within 500 m of a wetland, or within 500 m of a river. The remaining areas are not assigned any sensitivity ranking by the Screening Tool. The sensitivities of the National Screening Tool have been considered; however, the sensitivity map produced includes additional sensitivities. The pre-construction monitoring confirmed high sensitivity areas for bat species that are linked to several watercourses and open water sources.

The sensitivity map (Figure 3.29) indicates areas of the site based on features identified to be important for foraging and roosting of the species that are most probable to occur on site. The features identified include species ecology, habitat preferences and bat activity recorded by the passive bat detection systems. The sensitivities have been classified as High, with the parameters based on landscape features including amount of surface rock, topography, vegetation, climate, and presence of surface water. High sensitivities and their buffers are ‘no-go’ zones for turbines and turbine blade overhang i.e., turbine blades cannot intrude into High sensitivity buffers. The High bat sensitivity areas have been avoided by all the proposed turbines during the EIA phase (see Figure 3.29).

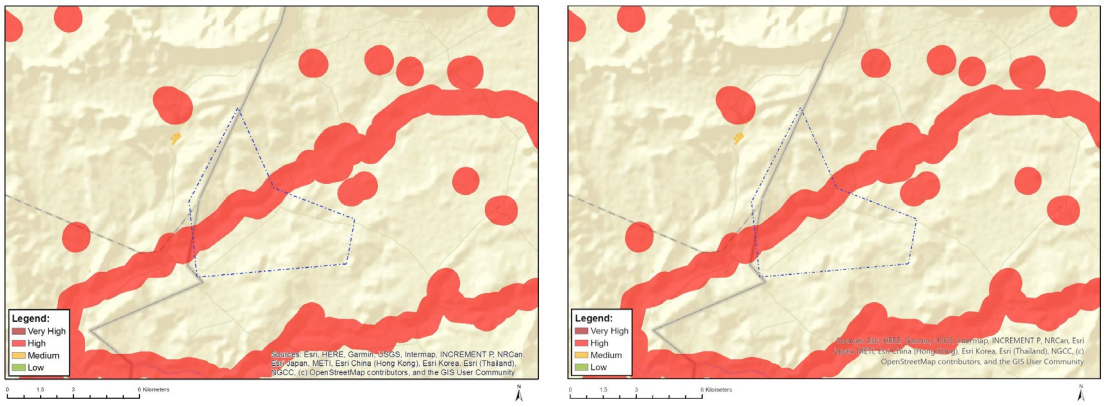


Figure 3.28: Bats (Wind) Sensitivity for the WEF study area based on the 2023 (left) and 2025 (right) Screening Tool (Source: DFFE Screening Tool, 2023 and 2025).

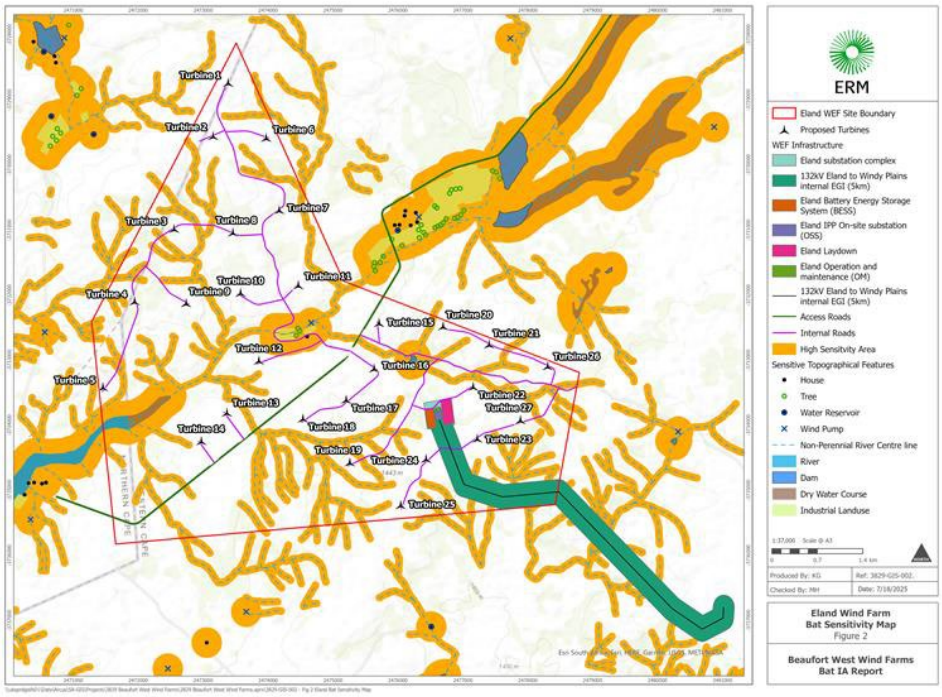


Figure 3.29: Bats (Wind) Sensitivity for the WEF study area following the site sensitivity verification. (Source: ERM, 2025 Appendix G.12)

Note that the Screening Tool map is unchanged. Moreover, the specialist has confirmed that the findings of the specialist inputs to the Final Scoping Report, and the SSV included in the Final Scoping Report, are still valid and the environmental context has not changed.

3.2.8 Avifauna

The information described below is based on EIA level inputs provided by the Avifauna Specialist, which are included in Appendix G.4 of this EIA Report.

The main source of information on the avifaunal diversity and abundance at the avifaunal Project Area of Impact (PAOI) is an integrated pre-construction monitoring programme that was implemented at the Northern Cluster of the proposed Genesis renewable energy projects, including the proposed WEF and PAOI, which was completed between December 2020 and December 2021. Additional nest verifications took place on May 2024, June 2024 and again in July 2025 to ensure that the WEF layout (turbine locations) do not overlap with any recommended buffer zones around any known/new nest locations.

A total of 173 species could potentially occur within the Broader Area where the proposed Project is located. Of these, 28 are classified as priority species for wind energy developments. Of the 28 WEF priority species, 15 have a medium to high likelihood of regular occurrence at the Project Area of Impact (PAOI), and 10 of these species have been recorded at the PAOI during the pre-construction monitoring surveys thus far. Seven Red Data species have a medium to high likelihood of regular occurrence at the PAOI, and four Red Data species have been recorded during the on-site surveys, namely Blue Crane, Karoo Korhaan, Secretarybird, and Verreaux's Eagle.

Refer to Table 3.5 for a list of priority species potentially occurring in the study area and potential impacts on them by the proposed project.

Table 3.5: WEF priority species potentially occurring at the Project Site on a regular basis and the potential impacts of the Eland WEF and associated power line on avifauna[16]

CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; H = High; M = Medium; L = Low (Source: AfriAvian Environmental, 2025, Appendix G.4)

Species Name	Scientific Name	SABAP2 Reporting Rate %		IUCN Conservation Status	Regional Conservation Status	Recorded during monitoring	Likelihood of regular occurrence at the Project Site	Nama Karoo	Surface water: Drainage lines, dams and water troughs	Ridges	Agriculture	Alien trees	Collision With Turbines	Displacement: Habitat Transformation	Displacement – Disturbance (Breeding)	Electrocutions 33 kV OHLs & Substations	Power Line - Collision (33 kV)	Power Line - Collision HV (132 kV)
		Full protocol	Ad hoc protocol															
African Fish Eagle	*Haliaeetus vocifer*	1,00	0,00	-	-		L		x			x	x		x	x	x	x
African Harrier-Hawk	*Polyboroides typus*	2,00	0,00	-	-		L					x	x		x	x	x	x
African Rock Pipit	*Anthus crenatus*	8,00	3,38	NT	-		M	x			x			x	x			
Amur Falcon	*Falco amurensis*	1,00	1,35	-	-	x	M		x	x		x	x			x	x	x
Black Harrier	*Circus maurus*	2,00	0,00	EN	EN		L					x	x		x	x	x	x
Black Sparrowhawk	*Accipiter melanoleucus*	2,00	0,00	-	-		L	x	x	x		x	x		x	x	x	
Black Stork	*Ciconia nigra*	2,00	0,68	-	EN	x	L	x			x		x		x	x	x	
Black-chested Snake Eagle	*Circaetus pectoralis*	1,00	0,00	-	-		L		x	x		x	x		x	x	x	x
Blue Crane	*Grus paradisea*	4,00	4,73	VU	VU	x	M	x	x		x		x	x	x		x	x
Booted Eagle	*Hieraaetus pennatus*	3,00	1,35	-	-		L		x	x		x	x		x	x		
Cape Eagle-Owl	*Bubo capensis*	4,00	1,35	-	-		M			x		x	x		x	x	x	
Common Buzzard	*Buteo buteo*	2,00	0,68	-	-		L		x	x		x	x			x		
Double-banded Courser	*Rhinoptilus africanus*	4,00	1,35	-	-	x	M	x			x		x	x	x			x
Greater Flamingo	*Phoenicopterus roseus*	1,00	0,68	-	NT		L		x				x				x	x
Greater Kestrel	*Falco rupicoloides*	2,00	0,68	-	-	x	M	x				x	x		x	x		x
Grey-winged Francolin	*Scleroptila afra*	11,00	6,76	-	-	x	M	x			x		x	x	x			
Ground Woodpecker	*Geocolaptes olivaceus*	3,00	2,03	NT	NT	x	M	x		x				x	x			

[16] *Note that the same 132 kV power line has been assessed in both the Eland and Windy Plains avifaunal assessments*

Species Name	Scientific Name	SABAP2 Reporting Rate %		IUCN Conservation Status	Regional Conservation Status	Recorded during monitoring	Likelihood of regular occurrence at the Project Site	Nama Karoo	Surface water: Drainage lines, dams and water troughs	Ridges	Agriculture	Alien trees	Collision With Turbines	Displacement: Habitat Transformation	Displacement – Disturbance (Breeding)	Electrocutions 33 kV OHLs & Substations	Power Line - Collision (33 kV)	Power Line - Collision HV (132 kV)
		Full protocol	Ad hoc protocol															
Hamerkop	*Scopus umbretta*	2,00	0,00	-	NT		L		x			x	x	x	x		x	
Jackal Buzzard	*Buteo rufofuscus*	52,00	28,38	-	-	x	H		x	x		x	x		x	x	x	x
Karoo Korhaan	*Eupodotis vigorsii*	63,00	13,51	-	NT	x	H	x			x		x	x	x		x	
Kittlitz's Plover	*Charadrius pecuarius*	2,00	4,05	-	NT	x	M		x					x	x		x	
Lanner Falcon	*Falco biarmicus*	3,00	1,35	-	NT		L		x	x		x	x		x	x		x
Lesser Kestrel	*Falco naumanni*	0,00	0,68	-	-		L	x				x	x			x		
Ludwig's Bustard	*Neotis ludwigii*	12,00	8,11	EN	EN	x	M	x			x		x	x	x		x	x
Martial Eagle	*Polemaetus bellicosus*	6,00	3,38	EN	EN		M		x	x			x		x	x		x
Pale Chanting Goshawk	*Melierax canorus*	36,00	12,16	-	-	x	H	x	x			x	x		x	x		x
Rufous-breasted Sparrowhawk	*Accipiter rufiventris*	1,00	0,00	-	-		L	x	x	x		x	x		x	x		
Secretarybird	*Sagittarius serpentarius*	4,00	0,68	EN	VU	x	M	x			x		x	x	x		x	
Spotted Eagle-Owl	*Bubo africanus*	4,00	0,00	-	-		M			x		x	x		x	x	x	
Verreaux's Eagle	*Aquila verreauxii*	16,00	6,76	-	VU	x	H		x	x			x		x	x	x	
White Stork	*Ciconia ciconia*	1,00	0,00	-	-		L		x		x		x				x	
Yellow-billed Duck	*Anas undulata*	6,00	2,03	-	NT	x	M		x				x	x			x	x

3.2.8.1 Screening Tool Descriptions and Site Sensitivity Verification

Figure 3.30 and Figure 3.31 illustrate the PAOI and power line corridor in relation to Avifaunal Sensitivity as identified by the Screening Tool. In terms of the Screening Tool, the PAOI and immediate environment is classified as Medium sensitivity for bird species according to the Terrestrial Animal Species Theme[17]. The Medium sensitivity classification is linked to the potential occurrence of Ludwig's Bustard (Globally and Regionally Endangered) and Verreaux's Eagle (Regionally Vulnerable). The Screening Tool Report sensitivity ratings have not changed since the 2023 assessment.

The WEF Project Site and 132 kV power line corridor contains confirmed habitat for SCC as defined in the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Notice 1150, 30 October 2020, as amended by Government Notice 3717 of 28 July 2023). The occurrence of SCC was confirmed during the on-site surveys. The following SSC have been recorded (Table 3.6):

Table 3.6: Species of Conservation Concern recorded at the WEF Project Site and surrounds during pre-construction monitoring

No.	Common Name	Scientific Name	Global Status	Regional Status
1.	Black Stork	*Ciconia nigra*	-	EN
2.	Blue Crane	*Grus paradisea*	VU	VU
3.	Ground Woodpecker	*Geocolaptes olivaceus*	NT	NT
4.	Karoo Korhaan	*Heterotetrax vigorsii*	-	NT
5.	Kittlitz's Plover	*Anarhynchus pecuarius*	-	NT
6.	Ludwig's Bustard	*Neotis ludwigii*	EN	EN
7.	Secretarybird	*Sagittarius serpentarius*	EN	VU
8.	Verreaux's Eagle	*Aquila verreauxii*	-	VU
9.	Yellow-billed Duck	*Anas undulata*	-	NT

[17] The Avian Wind Theme in the screening tool is only applicable to developments within a REDZ.

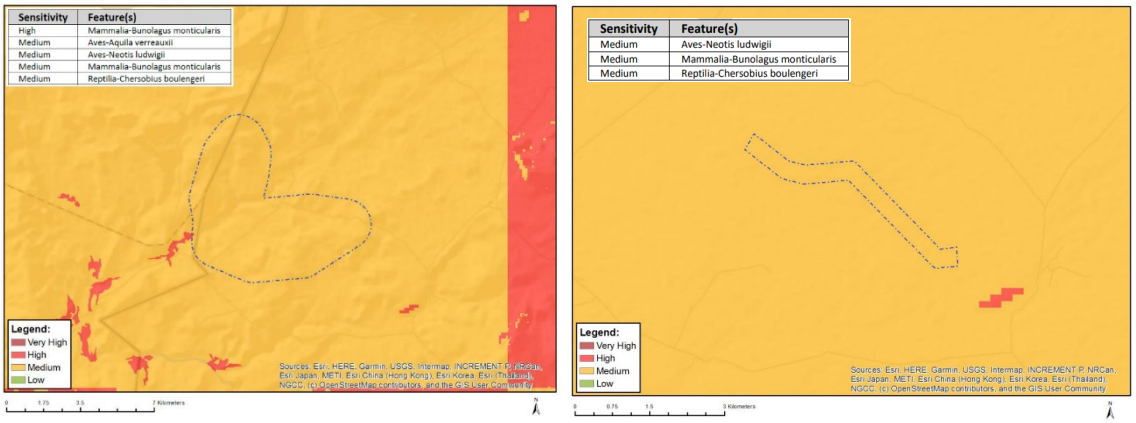


Figure 3.30: Avifaunal Sensitivity for the PAOI (left) and power line corridor (right) based on the Screening Tool (Source: DFFE Screening Tool, 2023)

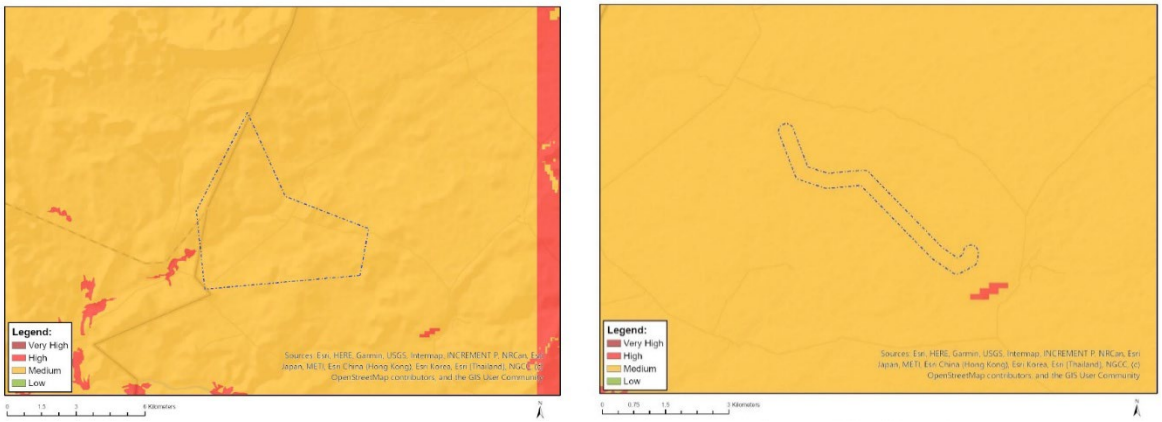


Figure 3.31: Avifaunal Sensitivity for the PAOI (left) and power line corridor (right) based on the Screening Tool (Source: DFFE Screening Tool, 2025)

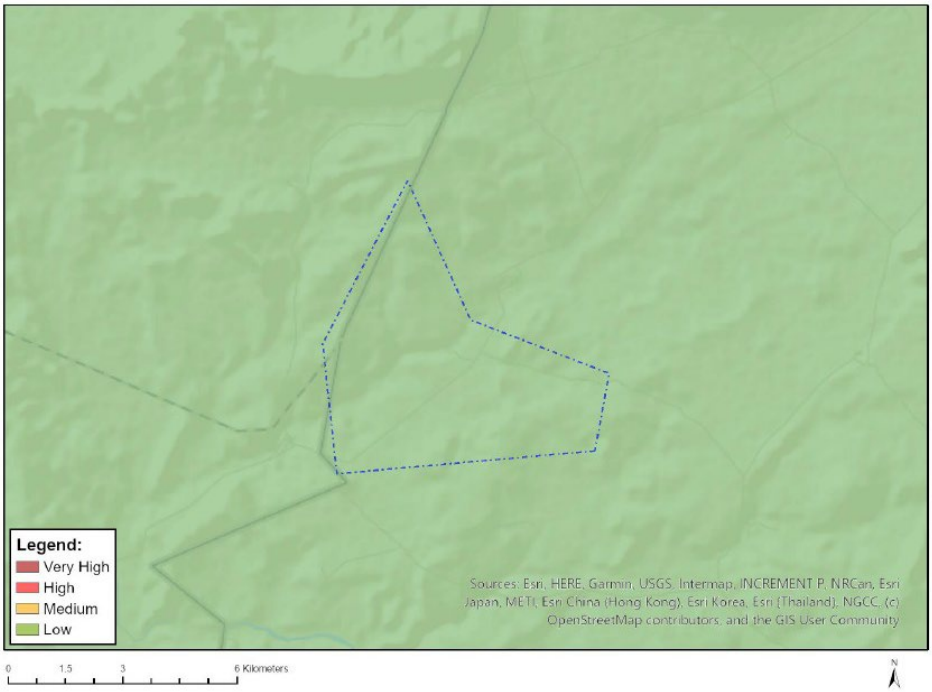


Figure 3.32: The 2025 National Web-Based Environmental Screening Tool map of the WEF Project Site indicating sensitivities for the Vulture Species Theme. The site is classified as Low Sensitivity. Note that the Vulture Species Theme environmental sensitivity was not yet implemented in 2023.

No vultures were observed during the pre-construction monitoring surveys and according to the SABAP2 data no vultures have been recorded in the Broader Area either. According to the Cervantes Population Utilization Distribution outputs the Eland WEF Project Site is also rated as low sensitivity (Cervantes *et al* 2023). Therefore, the site is considered **Low Sensitivity** (Figure 3.32) and therefore the DRAFT Protocol on Cape Vulture do not need to be followed.

Note that the Screening Tool map is unchanged. Moreover, the specialist has confirmed that the findings of the specialist inputs to the Final Scoping Report, and the SSV included in the Final Scoping Report, are still valid and the environmental context has not changed.

Based on the pre-construction monitoring surveys, a classification of High sensitivity for avifauna based on the presence of several SCC is suggested for the WEF. The following sensitive zones and buffers were recommended by the specialists:

- **Very High Sensitivity - All infrastructure exclusion zones:** A 1km all infrastructure exclusion zone is recommended to prevent the displacement of breeding Verreaux's Eagles during the construction phase due to disturbance (Figure 3.33). In addition, the buffer area will reduce the risk of injury to the juvenile bird due to collision with the solar panels, when it starts flying and practicing its hunting technique around the nest. There is currently no infrastructure planned within these exclusion zones.

- **High Sensitivity - Wind turbine exclusion zone (other infrastructure allowed):**
  - **Drainage lines, dams, and waterpoints:** Surface water in this semi-arid habitat is crucially important for priority avifauna and many non-priority species. The PAOI and the immediate surrounding area contain several non-perennial rivers, drainage lines, and dams, which are sources of surface water. It is preferable to leave some open space where possible with no wind turbines, for birds to access and leave the surface water areas unhindered. Surface water is also important area for raptors to hunt birds which congregate around water troughs, and they should have enough space for fast aerial pursuit. This will also benefit Blue Cranes which prefer to breed close to water bodies. A 100m rotor-swept area turbine exclusion zone is recommended around all drainage lines and a 200m rotor-swept area turbine exclusion zone around boreholes and dams. There are no turbines planned for these areas.
  - **Verreaux's Eagle nest:** A 3.7km rotor-swept area turbine exclusion zone is recommended around Verreaux's Eagle nesting sites to reduce the risk of mortality due to collisions with the wind turbines. There are no turbines planned in this zone.

- **Medium Sensitivity - Verreaux's Eagle nest**: A 5.2km rotor-swept area turbine exclusion zone is recommended around Verreaux's Eagle nesting sites as pro-active mitigation against displacement due to disturbance. All turbines in the area >3.7km up to 5.2km should be regarded as medium-risk and relocated if possible. Should relocation not be feasible, these turbines must be subject to a minimum of two years of pre-construction monitoring and pro-active mitigation in the form of a proven mitigation method such as Shutdown on Demand (SDoD), using either bio-monitors or an automated system must be implemented for the turbines remaining in this zone. There are no turbines planned in this zone.

Refer to Figure 3.33 for the avifaunal sensitivity zones identified for the study area based on avifaunal monitoring.

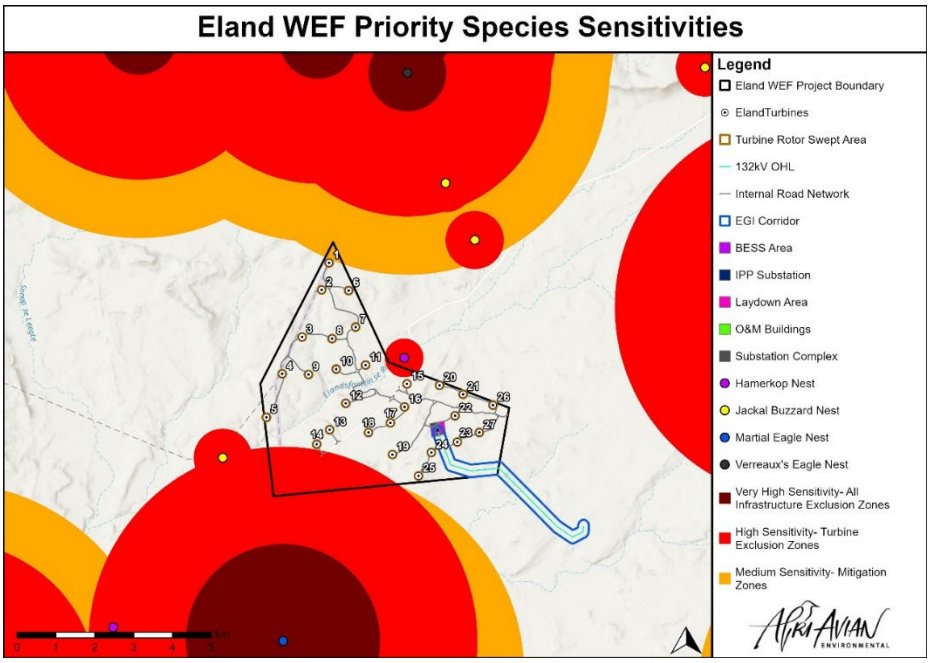


Figure 3.33: Avifaunal sensitivity zones identified for the study area based on pre-construction avifaunal monitoring data obtained. (Source: AfriAvian, 2025 Appendix G.4)

3.2.9 Visual Aspects and Sensitive Receptors

The information described below is based on EIA level inputs provided by the Visual Specialist, which are included in Appendix G.5 of this EIA Report.

The approach and methodology for the visual specialist study is based on the "Guideline for Involving Visual and Aesthetic Specialists in EIA Processes" (Oberholzer, 2005), and the use of GIS software as a tool to generate viewshed analyses and to apply relevant spatial criteria to the proposed facility. A detailed Digital Terrain Model (DTM) for the study area was created from topographical data provided by NASA in the form of a 30m SRTM (Shuttle Radar Topography Mission) elevation model.

The viewshed analysis (Figure 3.34) has been undertaken from each proposed turbine position as indicated within the proposed development area of the WEF in order to determine the general visual exposure (visibility) of the area under investigation. It is expected, from a visual impact perspective, that the wind turbines themselves would constitute the highest potential visual impact of the WEF, therefore, the viewshed analysis for the facility was undertaken at an offset height of maximum 300m above average ground level (i.e. the approximate maximum blade tip height of the turbines). It must be noted that the viewshed analysis does not include the effect of vegetation cover or existing structures on the exposure of the proposed wind turbines, therefore signifying a worst-case scenario.

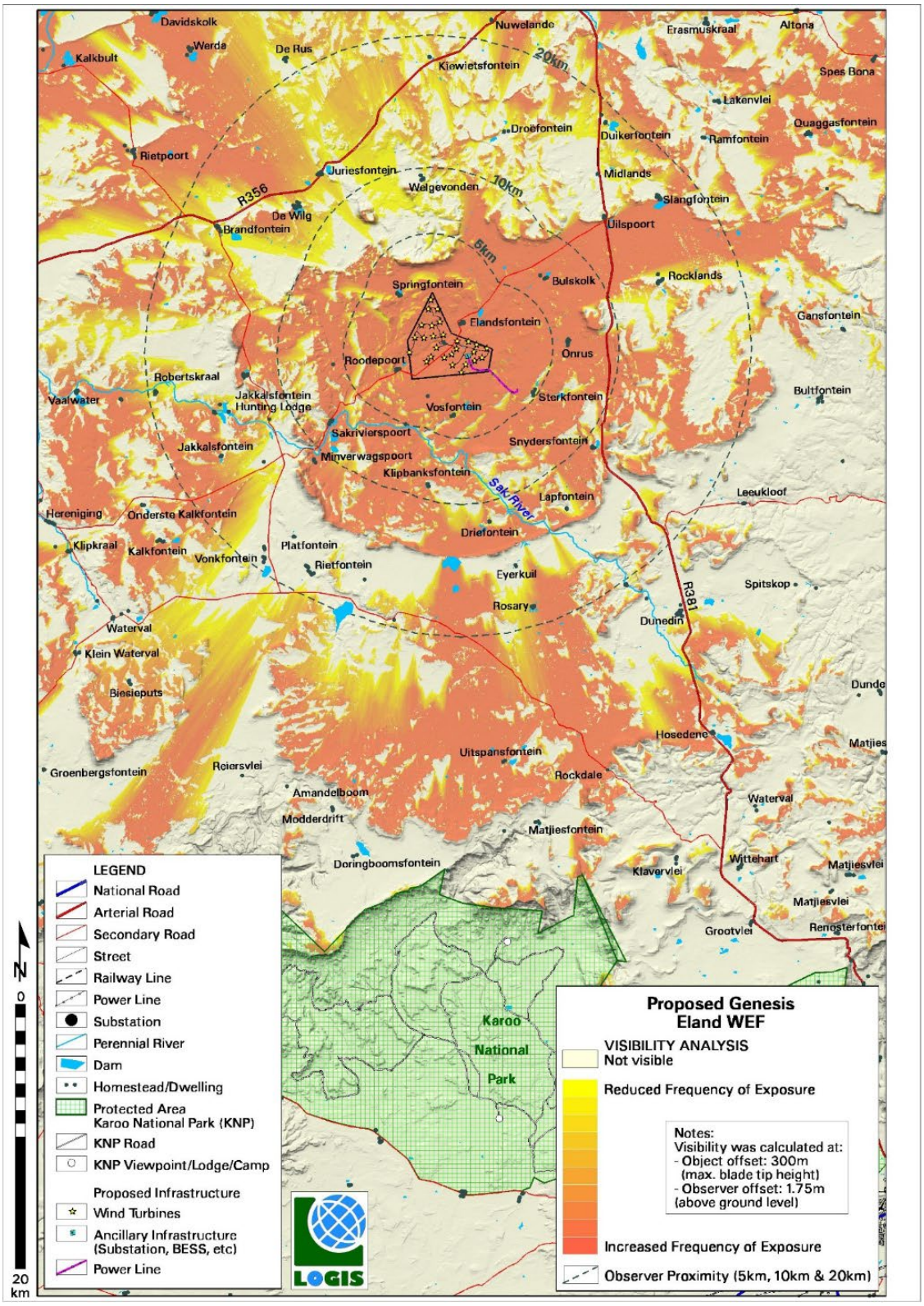


Figure 3.34: Viewshed analysis of the proposed WEF, indicating the frequency of visual exposure (Source: Logis, Appendix G.5, 2025).

The Visual Impact Assessment Report (Appendix G.5 of this EIA Report) made the following visual sensitivity findings:

- The landscape is sparsely populated, largely natural and undeveloped, with high visual quality and high landscape character sensitivity.
- The Visual Absorption Capacity (VAC) of the area is generally low, due to limited tall vegetation or existing infrastructure to provide screening.
- Sensitive receptors include farm homesteads (notably Donkergat, affected by shadow flicker), observers travelling the secondary road (DR02315) traversing the site, R381 and R356 scenic routes, and visitors to the Karoo National Park (approx. 37 km away).
- This study area is a known as a tourist destination.
- Cumulative impacts are a concern, as several renewable energy facilities are planned or authorised within 50km of the site, intensifying visual exposure in the Beaufort West Renewable Energy Development Zone (REDZ) and surrounds. They were not found to be a fatal flaw.
- Shadow flicker was not found to be an impact of concern as landowner consent was provided for the only affected homestead, Donkergat.
- The painting of wind turbine blades (as per the avifaunal specialist's recommendations) in high-contrast patterns (e.g., signal red stripes) was determined to slightly increase the visibility of the turbines compared to the standard uniform white blades. This incremental increase in visual impact was not regarded as a fatal flaw, or a material change in the significance of visual effects of the proposed WEF.

3.2.9.1 Screening Tool Descriptions and Site Sensitivity Verification

Figure 3.35 and Figure 3.36 illustrate the study area for the WEF in relation to Landscape (Wind) Theme and Flicker Theme Sensitivity (potential temporarily or permanently inhabited residence) as identified by the Screening Tool. The Screening Tool indicates that the site has a Very High sensitivity in terms of both themes.

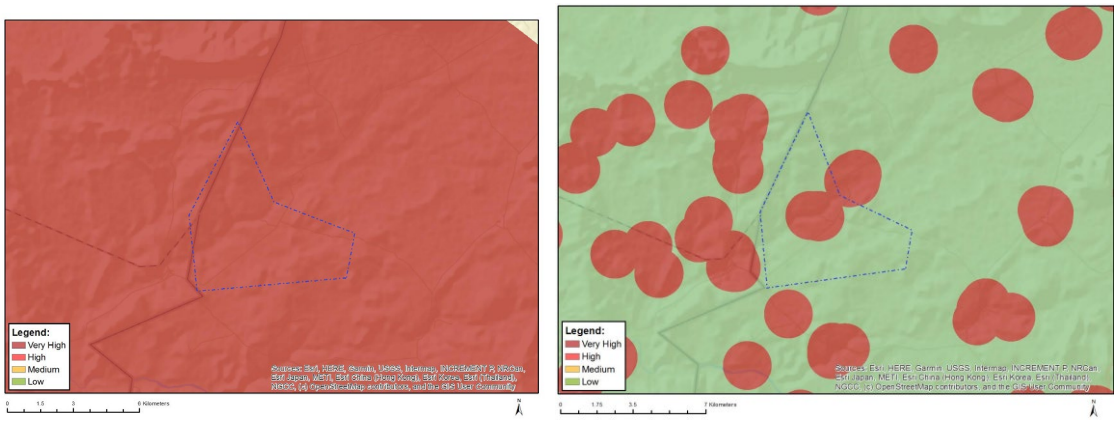


Figure 3.35: The relative Landscape Theme Sensitivity (left) and Flicker Theme Sensitivity (right) of the WEF study area based on the 2023 Screening Tool Report (Source: Screening Tool, 2023)

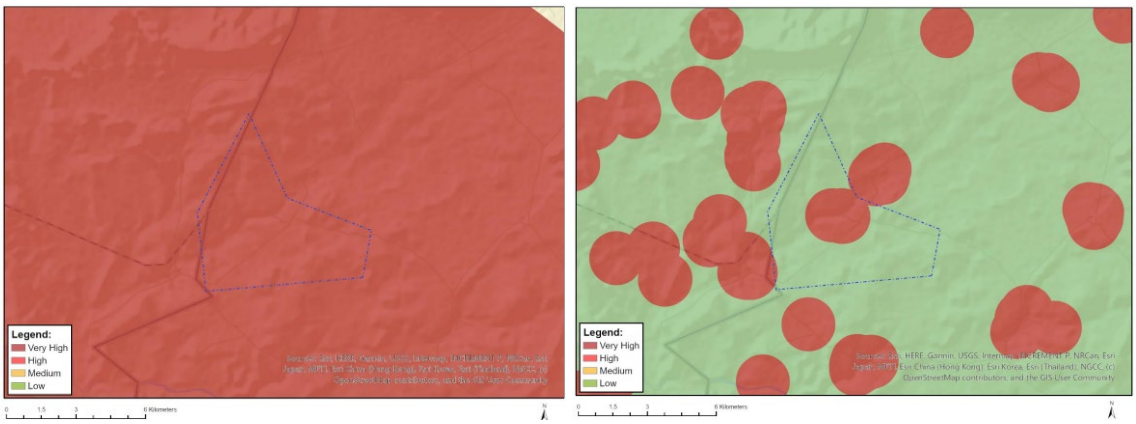


Figure 3.36: The relative Landscape Theme Sensitivity (left) and Flicker Theme Sensitivity (right) of the WEF study area based on the 2025 Screening Tool Report (Source: Screening Tool, 2025)

This Visual Impact Assessment (Appendix G.5 of this EIA Report) disputes some of the visual sensitivity classification identified by the Screening Tool with regards to flicker and landscape theme sensitivities. Overall, the sensitivity rating of the entire site can be considered as moderate / medium - as opposed to very high - as is currently (July 2025) and previously (March 2023) mapped in the Screening Tool. Additionally, this assessment confirms that the flicker theme is of very high sensitivity.

Note that the Screening Tool map is unchanged. Moreover, the specialist has confirmed that the findings of the specialist inputs to the Final Scoping Report, and the SSV included in the Final Scoping Report, are still valid and the environmental context has not changed.

3.2.10 Noise Aspects and Sensitive Receptors

The information described below is based on EIA level inputs provided by the Noise Specialist, and which are included in Appendix G.13 of this EIA Report.

The noise impact assessment followed three main approaches:

- A desktop study to model the likely noise emissions from the site,
- Field measurements of the existing residual noise at different locations in the vicinity of the project during the day and night-time, and
- The identification of potential Noise Sensitive Areas (NSAs).

3.2.10.1 Screening Tool Descriptions and Site Sensitivity Verification

Figure 3.37 illustrates the study area for the WEF in relation to Noise Theme Sensitivity as identified by the Screening Tool. The Screening Tool indicates that the site has a Very High sensitivity. Not all sensitive receptors shown below were included as NSAs as some of the identified sensitive receptors below are water troughs, kraals and abandoned structures.

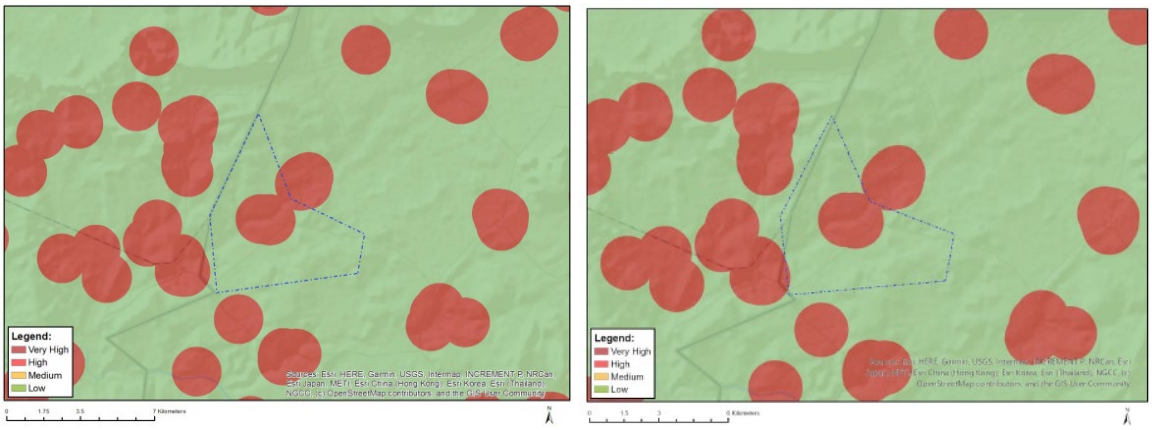


Figure 3.37: The relative Noise Theme Sensitivity of the WEF study area in based on the 2023 (left) and 2025 (right) Screening Tool Reports (Source: Screening Tool, 2023 and 2025).

The initial identification of potential noise sensitive areas was conducted through a visual scan of satellite imagery of the area. A total of 26 NSAs were identified. These NSAs are a combination of farmer's houses, staff houses, remote homesteads and possibly "Shepherd's Huts". Of the 26 NSAs that were identified, only NSA NC7 is situated on the development site and the remaining NSAs are adjacent to the development site boundary. Figure 3.38 shows the location of the NSAs in relation to the development boundary. Note that the proposed locations of the WTGs do not fall within the recommended 500m No-Go buffer[18].

There appears to be a discrepancy between the 2023 and 2025 DFFE screening tool assessment and the verification during the site visit and desktop review. There does not appear to be as many receptors as indicated in the screening tool as the classification algorithm may misrepresent natural features (tree, water bodies, etc.) as dwellings. Additional NSAs were identified that were not included in the screening tool report. Due to the distance of the receptors from the noise sources it is anticipated that the impacts will be of low significance. The very high sensitivity rating relating to the noise theme requires a Full Noise Impact Assessment to be conducted as per GN320 protocols on noise. The 500m no-go buffer applies to Wind Turbines only and not to auxiliary infrastructure.

Note that the Screening Tool map is unchanged. Moreover, the specialist has confirmed that the findings of the specialist inputs to the Final Scoping Report, and the SSV included in the Final Scoping Report, are still valid and the environmental context has not changed.

[18] A 500m buffer is recommended based on the experience of the Noise Specialist following extensive field studies at existing windfarms, both in South Africa and Europe. At this distance, the noise effects should be negligible.

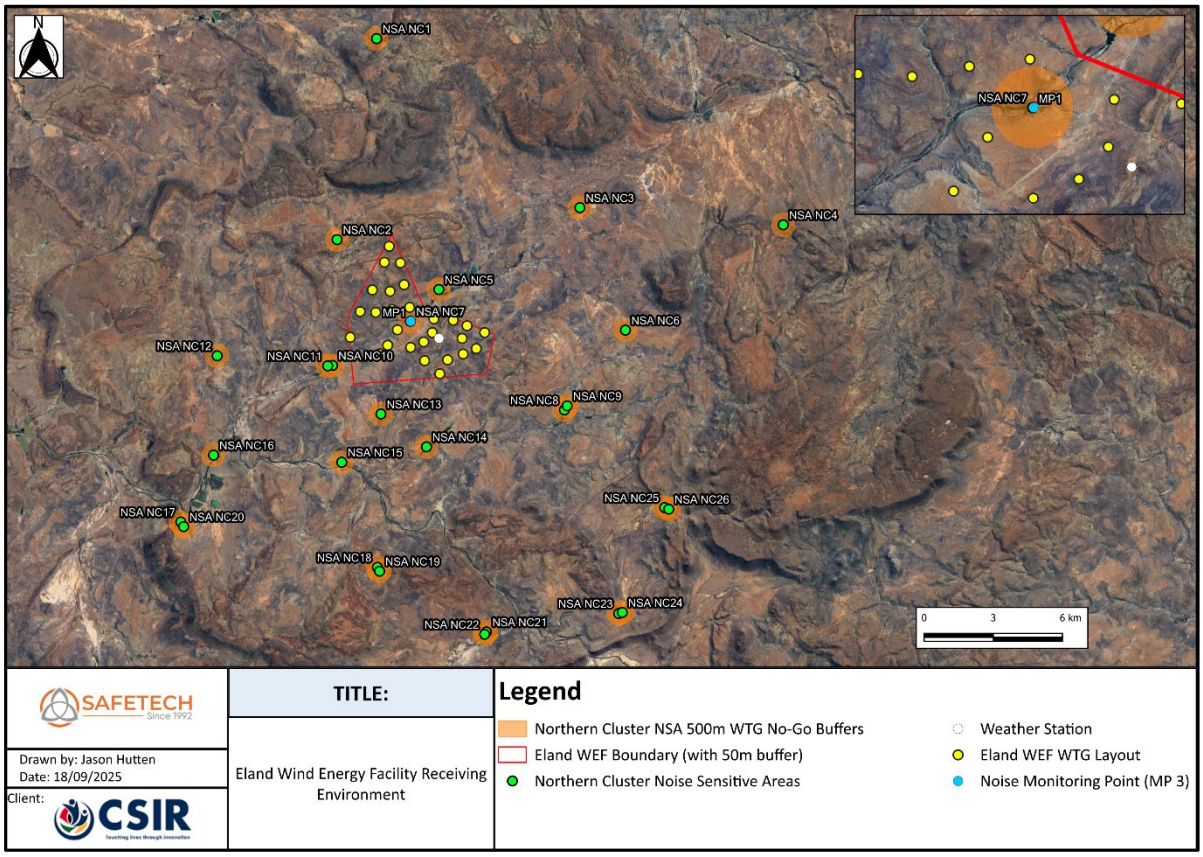


Figure 3.38: Locations of Noise Sensitive Areas (Source: Safetech, 2025 Appendix G.13).

3.2.11 Heritage: Archaeology and Cultural Landscape

The information described below is based on EIA level inputs provided by the Heritage Specialist, and which are included in Appendix G.6 of this EIA Report.

The Heritage Impact Assessment (HIA) was informed by a survey of available and relevant heritage literature, including reports generated for previous archaeological assessments and heritage studies in the vicinity of the project site. The WEF site was visited by Heritage Specialists as part of an initial Scoping Phase heritage field survey for the Beaufort West Cluster between 16 and 27 January 2023 and during a second round of fieldwork for the HIA conducted between 30 November and 5 December 2023. A third archaeological site visit for the proposed project was not deemed necessary for the HIA.

The archaeological site visits identified very little archaeological material within the areas assessed and no rock art or engravings. The pre-colonial sites and material that were recorded were limited to scattered Middle Stone Age lithics and some isolated, possibly Earlier Stone Age artefacts, all of which were considered ungradable.

Most of the heritage resources located within the Eland WEF study area and development footprint were historical, packed stone features and kraals. The majority of these were concentrated around the historical Donkergat farm werf on the Elandsfontein se Rivier and comprise a substantial and

extensive complex of stone walling but a line of packed stone cairns, which may represent historical farm boundary markers, recorded on the plateau south of the Donkergat farm werf, and ruined hut structures representing two possible stockposts were also recorded.

The presence of other archaeological sites or material, some of it potentially buried, cannot be discounted, however, and activities such as earthworks and excavations during the construction of the WEF may encounter and disturb archaeological material.

3.2.11.1 Screening Tool Descriptions and Site Sensitivity Verification

Figure 3.39 and Figure 3.40 illustrates the study area for the WEF in relation to relative Archaeological and Cultural Heritage Theme Sensitivity as identified by the Screening Tool. The Screening Tool indicates that the site has a Low sensitivity.

Areas which have not previously been subject to archaeological survey, such as the study area for the WEF, will, thus be indicated in the Screening Tool as having a low heritage sensitivity. simply because there is a lack of data, rather than because there are no heritage resources present. Archaeological and cultural heritage site surveys are, therefore, essential to the assessment of the veracity and accuracy of Screening Tool reports.

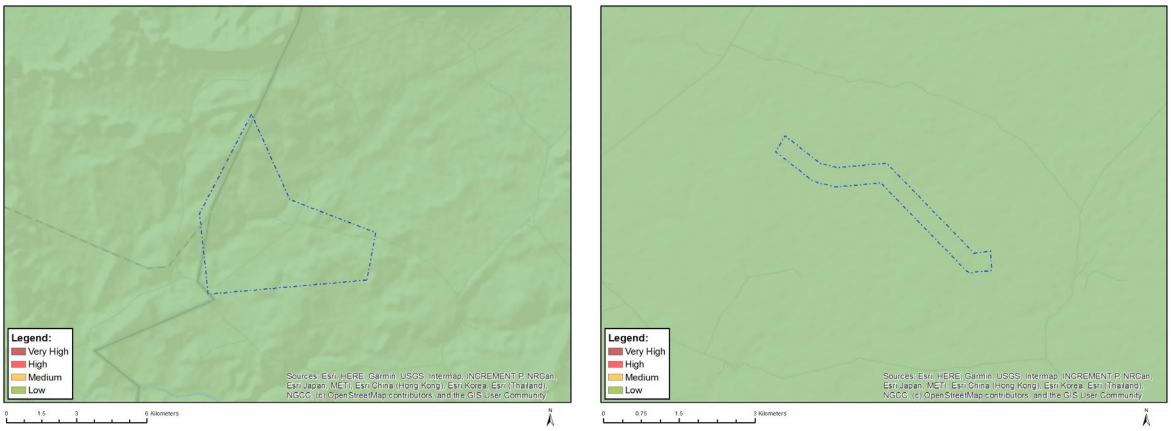


Figure 3.39: Archaeology and Cultural Heritage Combined Sensitivity of the WEF study area (left) and associated power line corridor (right) based on the 2023 Screening Tool Report (Source: Screening Tool, 2023).

Figure 3.40: Archaeology and Cultural Heritage Combined Sensitivity of the WEF study area (left) and associated power line corridor (right) based on the 2025 Screening Tool Report (Source: Screening Tool, 2025).

Prior to site work being undertaken, aerial photographs were analysed, together with the specialist's knowledge of the area, in order to identify any areas that were sensitive or needed to be focused on. Thereafter the site visit was undertaken to ground-truth the study area. The site sensitivity verification indicated that the Screening Tool assessment in respect of archaeology and cultural heritage is largely accurate. No significant pre-colonial archaeological sites and materials were recorded in the areas surveyed. Some locally significant (3C) colonial era stone-built structures were recorded in and around the Donkergat farmstead.

Note that the Screening Tool map is unchanged. Moreover, the specialist has confirmed that the findings of the specialist inputs to the Final Scoping Report, and the SSV included in the Final Scoping Report, are still valid and the environmental context has not changed.

The Heritage Specialist recommends that:

- The portions of walls JG009 and JG024 which will be demolished to accommodate the increased width and new alignment of the existing farm road required for the construction of the WEF should be photographically recorded by an archaeologist before the demolition takes place.
- Special care should be taken during upgrade of the access road through the Donkergat werf and its use for construction-related activities to ensure that the remaining portion of wall JG024 and the historical kraal GEB005 are not damaged or disturbed. The ECO, in collaboration with the relevant construction manager(s), must make this clear to the contractors and must monitor their compliance. It is suggested that the wall and kraal are marked or signposted to make this clear. Should any damage to either of these features occur, HWC must be informed immediately.
- The following no-go buffers are implemented around other stone features:
  - 30 m buffer around JG019 (large stone-walled enclosure);
  - 30 m buffer around JG001-JG003 (stockpost);
  - 50 m buffer around JG016-JG018 (corbelled huts);
  - 10 m buffer around GEB003 (stone cairn);
  - 10 m buffer around JG010 (stone cairn).

3.2.12 Palaeontology

The information described below is based on the Palaeontology Scoping-level Assessment, which is included in Appendix G.7 of this EIA Report.

The WEF and associated grid infrastructure in the Northern and Western Cape is depicted on the 1:250 000 Beaufort West 3222 (1979) Geological Map (Council for Geosciences, Pretoria) (Figure 3.41). The study area is underlain by Middle to Late Permian continental fluvial and lacustrine sediments of the lower portion of the Teekloof Formation (Pth, green; Poortjie and Hoedemaker Members of the Beaufort Group, Karoo Supergroup). Jurassic dolerite dykes and sills (Jd, red) intrude the succession and cross the development footprint. The bedrock is further mantled by Quaternary alluvium, gravel, and calcrete, which are not depicted on the 1:250 000 geological map. The Palaeozoic bedrocks are mostly concealed, with only limited exposure along drainage lines, erosion gullies, and hillslopes, and potential fossil sites are likely to be preserved within buffer zones along watercourses recommended by the aquatic specialist. The bedrock consists predominantly of grey mudstone, reddish in places, interlayered with sandstone and siltstone, largely mantled by Quaternary superficial deposits. Extensive gravelly to sandy surfaces are dissected by numerous, mostly dry, watercourses.

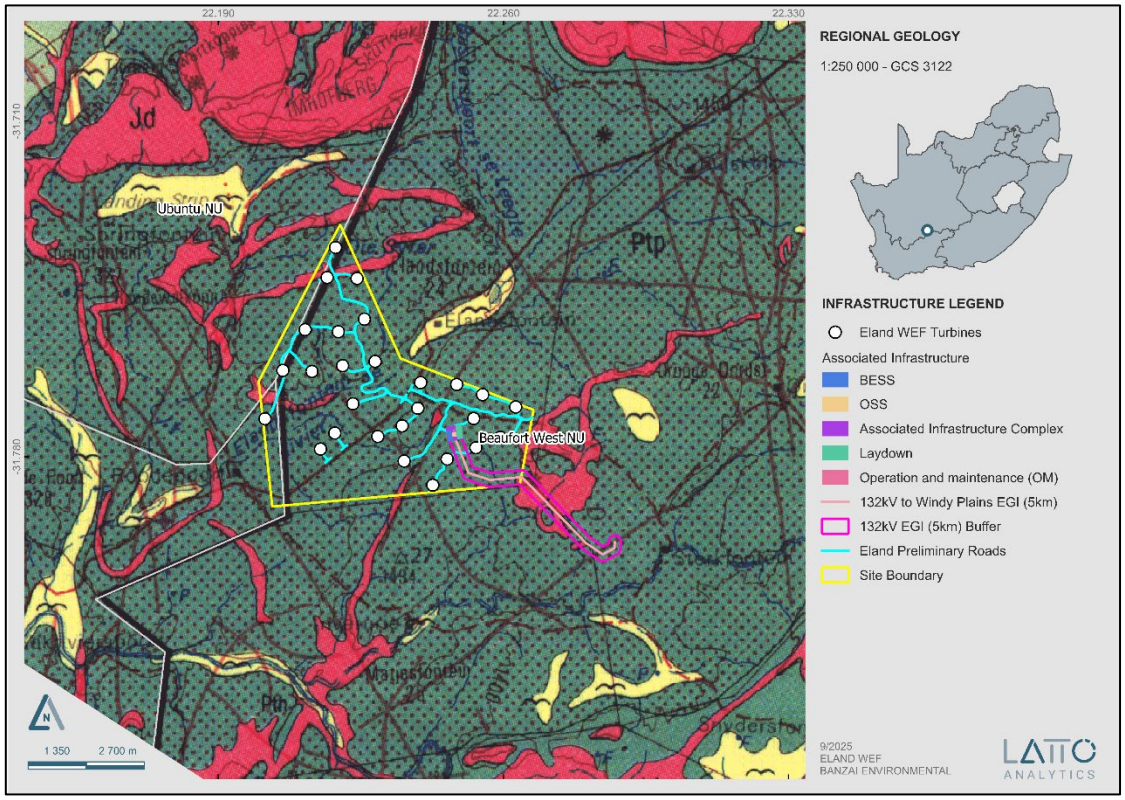


Figure 3.41: Extract of the 1:250 000 Beaufort West 3222 (1979) Geological Map (Council of Geoscience, Pretoria) indicating that the development is underlain by the Poortjie Member of the Teekloof Formation (Pth; green) (Adelaide Subgroup, Beaufort Group), while only a very small area of the development is underlain by Jurassic dolerite (Jd, red). NU = Non-Urban (Banzai Environmental, 2025, Appendix G.7).

Over the past several decades, extensive palaeontological research and fossil collecting have been undertaken within this part of the basin. According to the National GIS Palaeontological Databases, the Loxton–Beaufort West area is regarded as fossiliferous, with documented fossil localities concentrated to the west, south, and east of the proposed Eland WEF development. However, no fossils have previously been documented within the Eland WEF footprint.

3.2.12.1 Screening Tool Descriptions and Site Sensitivity Verification

According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS), the Teekloof Formation is assigned a Very High Palaeontological Sensitivity (Figure 3.42). Similarly, the Screening Tool indicates that the study area has a Very High sensitivity rating in terms of the relative Palaeontology Theme Sensitivity (Figure 3.43 and Figure 3.44).

A ten day-comprehensive site-specific field survey of the development footprint for the combined projects was conducted on foot and motor vehicle in January 2023. A second site visit in the EIA Phase is not deemed to be needed. Several fossiliferous outcrops were identified in the Eland WEF footprint, but the site investigation as well as desktop research (National Museums Database and published data) concluded that fossil heritage of scientific and conservational interest in the Eland WEF area is relatively rare and of low scientific and conservational value. Data indicates that fossil sites are generally rare, sporadic and unpredictable.

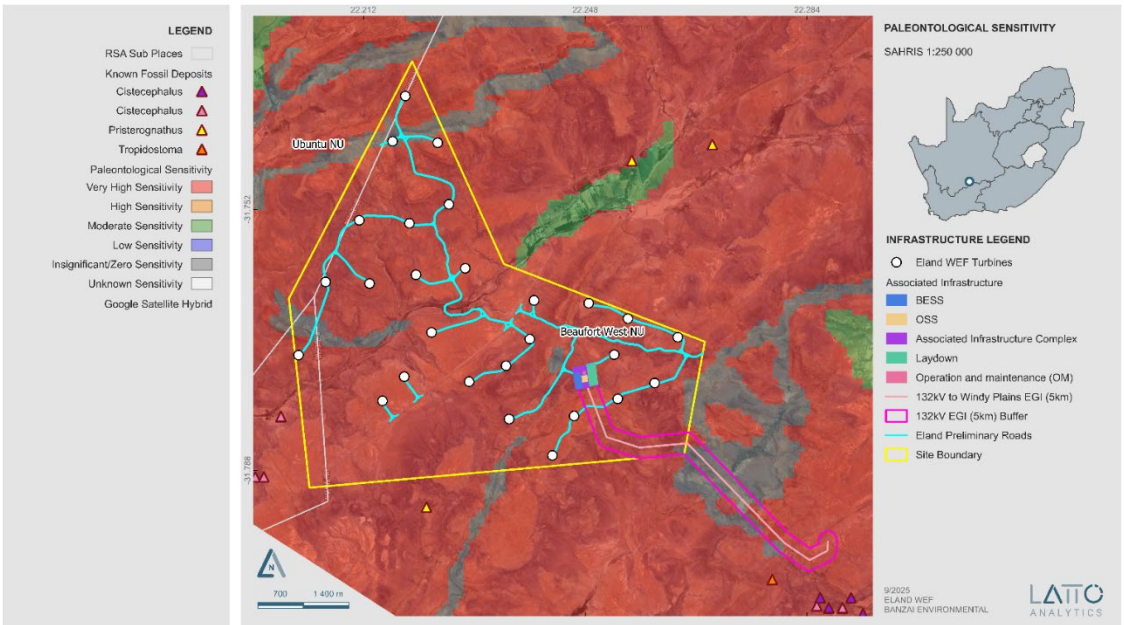


Figure 3.42: Extract from the SAHRIS PalaeoMap (Council for Geoscience) showing the Very High Palaeontological Sensitivity of the Eland WEF development area. Triangles indicate known fossil localities recorded in the National GIS Palaeontological Database. (Banzai Environmental, 2025, Appendix G.7).

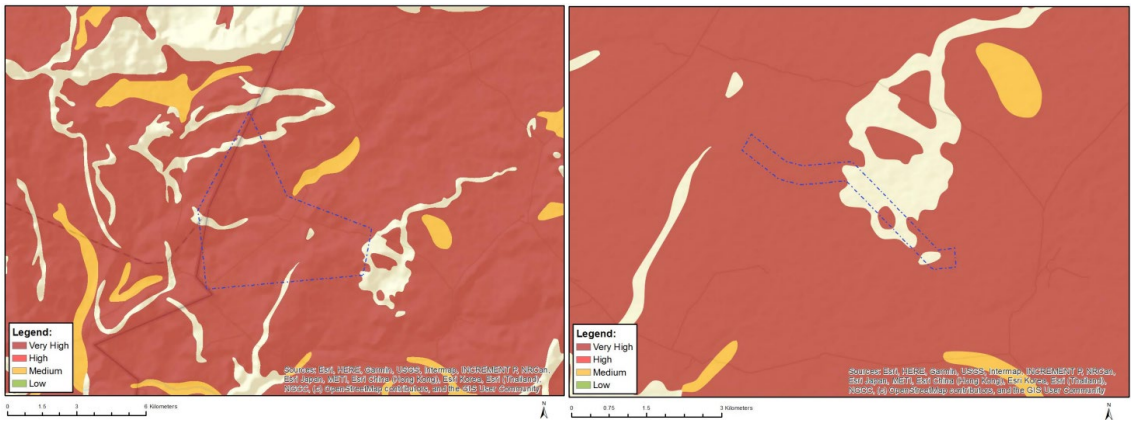


Figure 3.43: Palaeontological Sensitivity of the WEF study area (left) and associated power line corridor (right) based on the 2023 Screening Tool Report (Source: Screening Tool, 2023).

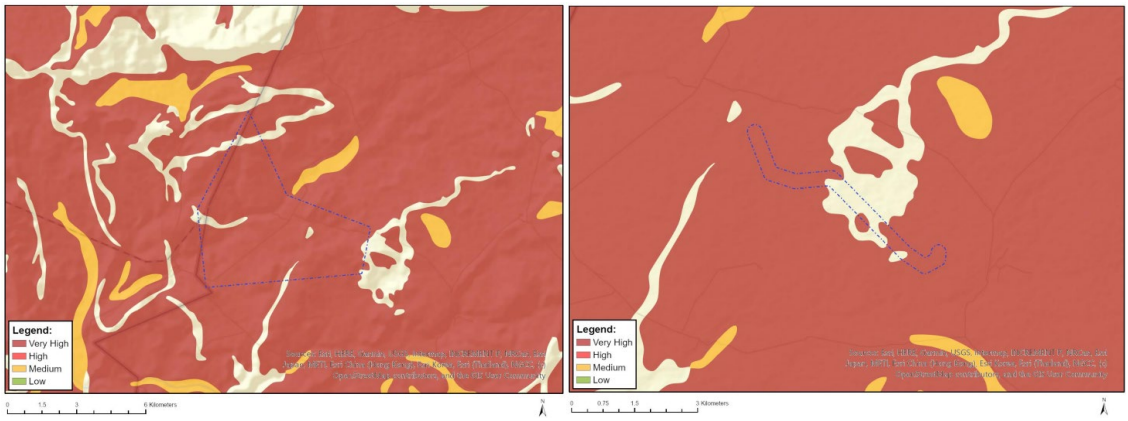


Figure 3.44: Palaeontological Sensitivity of the WEF study area (left) and associated power line corridor (right) based on the 2025 Screening Tool Report (Source: Screening Tool, 2025).

The recorded presence of fossils within the development footprint corroborates the Very High Palaeontological Sensitivity assigned to the area by both the SAHRIS Palaeontological Sensitivity Map and the 2023 and 2025 Screening Tool. Moreover, the specialist has confirmed that the findings of the specialist inputs to the Final Scoping Report, and the SSV included in the Final Scoping Report, are still valid and the environmental context has not changed.

The construction phase will be the only development phase impacting Palaeontological Heritage, and no significant impacts are expected to impact the Operational and Decommissioning phases. Proceeding with the project, while resulting in some inevitable disturbance to fossil heritage, would have a low significance impact post-mitigation, which is considered acceptable. Moreover, residual negative impacts from fossil loss would be partially offset by a positive outcome, as any newly discovered, well-recorded, and suitably curated fossil material recovered during construction would enhance the regional palaeontological database and contribute to the broader scientific understanding of South Africa's fossil heritage.

If any fossiliferous deposits are exposed by surface clearance or excavations during the construction phase of the development, the Chance Fossils Finds Protocol should be fully

implemented. These mitigation measures have been translated into the EMPrs (Appendix H.1 to H.3), which forms part of this EIA Report.

3.3 Socio-Economic Environment

The available data used to compile the socio-economic baseline for the Namakwa District Municipality (NDM), Karoo Hoogland Local Municipality (KHLM), Central Karoo District Municipality (CKDM), Beaufort West Local Municipality (BWLM), Pixley ka Seme District Municipality (PKSDM), and the Ubuntu Local Municipality (ULM), although not exhaustive, is interpreted in terms of professional opinion and is indicative of generally accepted trends within the Western Cape Province, Northern Cape Province, and the broader South Africa.

The information described below is based on CSIR's review of Census data sourced from Statistics South Africa (StatsSA), as well as, where relevant, the Socio-Economic Assessment (included in Appendix G.8 of this EIA Report), as well as a review of various planning documents such as IDPs and SDFs that were available at the time of compiling the Scoping Reports and EIA Reports.

3.3.1 Regional Context – Namakwa District Municipality

The NDM is located in the northern part of the Northern Cape Province, bordered by Namibia to the north and the Atlantic Ocean to the west with Springbok being the administrative seat of the NDM (NDM, 2025)[19]. The NDM is a Category C municipality (i.e., it has municipal executive and legislative authority in an area that includes more than one municipality). The NDM is the largest district geographically in South Africa, covering an area of approximately 126 836 km^2 (NDM, 2025). The district comprises six local municipalities namely, the Richtersveld, Nama Khoi, Khai-Ma, Kamiesberg, Hantam, and Karoo Hoogland Local Municipalities.

3.3.1.1 Demographics and Economic Profile

According to StatsSA (2024)[20], the NDM recorded a total population of 115 842 in 2011, which subsequently increased to 148 935 in 2022 (Table 3.7), reflecting an average annual growth rate (2.4%) higher than the provincial growth rate for the Northern Cape (1.6%). Of the NDM's total population in 2022, the largest proportion (67.4%) was within the working-age population (15-64 years), followed by the 0-14 age category (23.1%), while the smallest age category (9.5%) was those aged 65 years and older (StatsSA, 2024). The NDM's dependency ratio, i.e., the ratio of non-economically active dependents (usually people younger than 15 or older than 65) to the working age (15 – 64 years) population (Municipal Socio-Economic Profiles [MSEP], 2021)[21] declined from 51.2 in 2011 to 48.3 in 2022, indicating a reduced burden on the working-age population (StatsSA, 2024). In terms of race groups, in 2022, Coloureds accounted for the largest share at 85.5% (127 288 people), followed by Whites (7.5%), Black Africans (5.9%), Indians/Asians (0.6%), and Other (0.4%) (NDM, 2025).

[19] Namakwa District Municipality (2025). *Final Revised Integrated Development Plan 2025/2026.* [Online] Available at: https://www.namakwa-dm.gov.za/wp-content/uploads/2025/06/Namakwa-DM-Council-Approved-Final-IDP-2025-2026-18-Jun-2025.pdf [Accessed 16 September 2025].
[20] Statistics South Africa (2024). *Census 2022 – Provincial Profile: Northern Cape.* [Online] Available at: https://www.statssa.gov.za/publications/Report-03-01-72/Report-03-01-722022.pdf [Accessed 16 September 2025].
[21] Municipal Socio-Economic Profiles (2021). *Municipal Socio-Economic Profiles: Karoo Hoogland Northern Cape.* [Online]. Available at: https://lg.treasury.gov.za/ibi_apps/rs/ibfs//WFC/Repository/Public/Municipal_Socio-Economic_Profiles/Profiles/Municipal_Profiles/Northern_Cape/Karoo-Hoogland.pdf Accessed: September 2025].

Table 3.7: Total population of the NDM, KHLM, Northern Cape, and National for the period 2011 – 2022 (Sources: StatsSA, 2025)[22].

Region → / Year ↓	NDM	KHLM	Northern Cape	National Total	KHLM as a % of the NDM	KHLM as a % of the province	KHLM as a % of national
2011	115 842	12 514	1 145 861	51 770 560	10.80%	1.09%	0.024%
2022	148 935	11 691	1 355 945	62 027 503	7.85%	0.86%	0.019%

With a Gross Domestic Product (GDP) contribution of 10.1% to the Northern Cape Province in 2022, the NDM was the smallest contributor to the provincial GDP compared to the other five DMs within the province (Northern Cape Provincial Government, 2024)[23]. The mining sector was the largest economic sector in the NDM in 2020, at R3.9 billion (40.4%) of the total Gross Value Added (GVA) in the NDM's economy (NDM, 2022)[24]. The community services sector was the second largest economic sector in the NDM in 2020, at R1.6 billion (16.7%) of the total GVA, followed by the agriculture economic sector, at R1.0 billion (10.2%) of the total GVA (NDM, 2022). The economic sector that contributed the least to the economy of the NDM in 2020 was the electricity sector with a contribution of R166 million (1.70%) of the total GVA (NDM, 2022). In 2022, mining was the dominant economic sector in the NDM, contributing 39.8% to the regional total industries, followed by community services (18.0%), agriculture (11.7%), trade (10.1%), finance (9.3%), transport (5.9%), and manufacturing (2.1%) (Northern Cape Provincial Government, 2024). The economic sectors in the NDM that contributed the least to the regional total industries were the construction and electricity sectors (1.5% each) (Northern Cape Provincial Government, 2024).

3.3.1.2 Social Characteristics

Unemployment has been identified as one of the challenges in the NDM (NDM, 2025)[25]. In 2022, the district recorded an unemployment rate of 28.0% with 13 591 people unemployed. While not the highest in the province, the NDM's unemployment rate is the second highest among the five DMs in the Northern Cape. The NDM has also experienced a decline in the young working age population (people aged 20 to 34) from 2010 (23.3%) to 2020 (22.4%) (NDM, 2022).

Based on the 2011 Census data, the majority of households in the NDM (22%) earned an average income of up to R40 000 per annum, whereas 9% of households in the NDM had no income and 3% of households earned an average income of up to R4 800 per annum (Wazimap, 2025a)[26].

[22] Statistics South Africa (2025). *Census 2022: Stats by Location* [Online] Available at: https://census.statssa.gov.za/#/province/3/2 [Accessed 30 July 2025].
[23] Northern Cape Provincial Government (2024). *Northern Cape Socio-Economic Review 2024.* Kimberley: Northern Cape Provincial Treasury. [Online] Available at: https://www.treasury.gov.za/documents/provincial%20budget/2024/5.%20Guide%20to%20the%20Budget/NC/Northern%20Cape%20Socio-Economic%20Review%202024.pdf [Accessed 16 September 2025].
[24] Namakwa District Municipality (2022). Integrated Development Plan 2022 – 2027. [Online]. Available at: https://www.namakwa-dm.gov.za/wp-content/uploads/2022/07/NDM-Council-Approved-IDP-2022-2027-28-Jun-2022.pdf [Accessed: September 2025].
[25] Namakwa District Municipality (2025). *Final Revised Integrated Development Plan 2025/2026.* [Online] Available at: https://www.namakwa-dm.gov.za/wp-content/uploads/2025/06/Namakwa-DM-Council-Approved-Final-IDP-2025-2026-18-Jun-2025.pdf [Accessed 16 September 2025].
[26] Wazimap (2025a). *Namakwa, Northern Cape*. [Online]. Available at: https://wazimap.co.za/profiles/district-DC6-namakwa/ [Accessed: September 2025].

The average annual income earned by households in the NDM was R 29 400, which is about the same as the amount in Northern Cape and South Africa (R29 400) (Wazimap, 2025a). The COVID-19 pandemic likely impacted income levels and increased the number of households in the NDM that live close to or below the poverty line.

According to Census 2022, formal dwellings dominate the housing landscape in the NDM, with approximately 95.3% of households residing in formal structures, which is higher than that of the Northern Cape (85.9%) and South Africa (88.5%) (StatsSA, 2025). Traditional dwellings account for approximately 1.3% of households in the NDM, while 3.1% of households in the NDM live in informal dwellings. The category classified as other dwellings makes up only 0.4% of households in the NDM.

3.3.2 Local Context – Karoo Hoogland Local Municipality

The KHLM is situated in the southern part of the Northern Cape and falls within the NDM. It spans approximately 29 423 km^2, making it the second largest of the six municipalities in the district (Karoo Hoogland Municipality [KHM], 2025)[27]. The municipality comprises three main towns, i.e., Williston, Fraserburg, and Sutherland (KHM, 2024)[28]. Table 3.8 provides an overview of various key statistics for the KHLM.

Table 3.8: Key statistics for the KHLM for 2022, 2011, and 2011 (KHM, 2024[28]; KHM, 2025[29]; StatsSA, 2025)

KEY STATISTICS	YEAR		
	2011	2016	2022
Total population	12 514	13 009	11 691
Young children (under 15 years)	27.8%	25.0%	25.5%
Working age (15 to 64 years)	62.2%	64.0%	64.8%
Elderly (65 years and older)	10.0%	11.0%	9.7%
Dependency ratio	60.7	56.2	54.4
Gender ratio	98.7	100	94.6
Growth rate	n/a	0.91%	-0.66%
No schooling aged 20+	18.4%	13.1%	12.0%
Higher education aged 20+	8.5%	11.5%	7.7%
Matric aged 20+	16.0%	25.8%	n/a
Number of households	3 804	4 620	2 885
Average household size	3.3	2.8	4.1
Female headed households	31.0%	32.4%	n/a
Formal dwellings	96.9%	99.4%	96.2%
Housing owned/paying off	47.4%	68.1%	n/a
Flush toilet connected to sewerage	57.0%	39.7%	69.7%
Weekly refuse removal	63.3%	58.3%	94.1%
Piped water inside dwelling	59.7%	75.2%	67.5%
Electricity for lighting	64.9%	67.5%	94.8%

[27] Karoo Hoogland Municipality (2025). *Final Annual Report 2023/2024: On the Performance of Karoo Hoogland Municipality.* [Online] Available at: https://www.karoohoogland.gov.za/wp-content/uploads/2025/09/FINAL-Annual-Report-2023-2024-KHM-31-March-2025.pdf [Accessed 16 September 2025].
[28] Karoo Hoogland Municipality (2024). *5th Generation: Integrated Development Plan (IDP) 2022/2027.* [Online] Available at: https://www.karoohoogland.gov.za/wp-content/uploads/2025/05/IDP-2022-2027-NC066-To-Council-22-May-2024-Final.pdf [Accessed 03 August 2025].
[29] Karoo Hoogland Municipality (2025). *Draft Annual Report 2023/24.* [Online] Available at: https://www.karoohoogland.gov.za/wp-content/uploads/2025/02/Annual-Report-2023-2024-KHM-30-Jan-2025.pdf [Accessed 30 July 2025].

3.3.2.1 Demographics and Economic Profile

The population of the KHLM was 12 514 in 2011, increased to 13 009 in 2016, and then declined to 11,691 in 2022. This decline makes the KHLM the most sparsely populated municipality in the Namakwa District, with a negative growth rate of -0.66% between 2016 and 2022. Despite moderate growth between 2011 and 2016, the decline in 2022 suggests trends of limited economic opportunities, ageing population structure, and the rural nature of the area, which often prompt younger residents to relocate to urban centres (KHM, 2025).

In terms of age structure, the proportion of residents under 15 years dropped from 27.8% in 2011 to 25.0% in 2016 and then remained fairly stable at 25.5% in 2022. The working age population (15-64 years) increased from 62.2% in 2011 to 64.0% in 2016 and reached 64.8% in 2022, indicating a slow but steady rise in the labour-active portion of the population. Conversely, the elderly population (65+ years) showed a marginal increase from 10.0% in 2011 to 11.0% in 2016, before slightly declining to 9.7% in 2022. The dependency ratio correspondingly decreased over the years, from 60.7% in 2011 to 56.2% in 2016, and then to 54.4% in 2022, reflecting a gradual reduction in the socio-economic burden on the working age population.

In terms of population groups, Coloured individuals made up the majority in 2011, accounting for 84.5% of the population, followed by Whites (13.6%), Black Africans (1.7%), and Indian/Asian or other groups (<0.2%). In 2022, the racial distribution remained largely similar with Coloured individuals accounting for 83.8% of the population, followed by the White (12.8%), Black African (2.3%), and Indian/Asian (0.9%) population groups. Afrikaans was the dominant first language spoken by over 90% of residents in both 2011 and 2016; other languages spoken include English, isiXhosa, and Setswana, though they represent only a small minority (KHM, 2024; Wazimap, 2025b[30]).

In 2022, the Northern Cape Province was the lowest contributor to South Africa's Gross Domestic Product (GDP), contributing 2.2% to the GDP (Northern Cape Provincial Government, 2024)[31]. In terms of provincial GDP, in 2022, the NDM made the smallest contribution compared to the other districts, with a contribution of 10.1% (Northern Cape Provincial Government, 2024)[31]. In 2022, the Northern Cape recorded an economic growth rate of 0.7% which was below the national economic growth rate of 1.9% (StatsSA, 2024). The KHLM economy is predominately driven by agriculture, with sheep farming forming the backbone due to the region's favourable climate and extensive grazing land (KHM, 2024)[28]. Tourism is an emerging secondary sector contributing to economic diversification. The municipality faces challenges such as limited infrastructure development, low population density, and high poverty levels linked to scarce employment opportunities (KHM, 2024)[28].

[30] Wazimap (2025b). *Karoo Hoogland, Northern Cape*. [Online]. Available at: https://wazimap.co.za/data/table/?table=LANGUAGE&geo_ids=municipality|district-DC6&primary_geo_id=municipality-NC066&release=2011 [Accessed: September 2025].
[31] Northern Cape Provincial Government (2024). *Northern Cape Socio-Economic Review, 2024*. [Online]. Available at: https://www.treasury.gov.za/documents/provincial%20budget/2024/5.%20Guide%20to%20the%20Budget/NC/Northern%20Cape%20Socio-Economic%20Review%202024.pdf [Accessed: September 2025].

3.3.2.2 Education

In terms of the highest education level (20+ years age group) in 2016, approximately 13.4% had no schooling, 14.1% had some Primary education, 8.4% completed Primary School, 26.1% had some Secondary education, 26.4% completed Secondary education and 11.6% had Higher education (KHM, 2024) (Table 3.8) In terms of the highest education level (20+ years age group) in 2022, approximately 12.0% had no schooling, 26.0% completed Secondary education and 7.7% had Higher education (KHM, 2024) (Table 3.8) Overall, there is a gradual improvement in the level of education in the KHLM. Between 2011 and 2022, the proportion of adults with no formal schooling declined from approximately 18.4% in 2011 to 12.0% in 2022, while those with higher education stood at around 7.7% in 2022 (Stats SA, 2025). Completion of Secondary education (Matric) increased from 16.0% to 25.8% during 2011 to 2016 (Municipalities of South Africa, 2025a)[32].

3.3.2.3 Employment and Income

Employment in the KHLM is concentrated in community, social, and personal services (42.5%), followed by transport, storage, and communication (15%), wholesale and retail trade, catering and accommodation (13.7%), agriculture, forestry and fishing (13%), finance, insurance, real estate and business services (8.8%), and manufacturing (5.9%) (KHM, 2025) (Table 3.8.) Unemployment remains a significant concern within the KHLM, aligning with broader trends observed in the NDM and Northern Cape Province. In 2016, the KHLM recorded an unemployment rate of 14.6% with the youth unemployment rate at 20.0% (KHM, 2025). In 2022, the NDM's official unemployment rate was 28.0% which was lower than that of the Northern Cape Province (32.7%) (NDM, 2025[33]; Northern Cape Provincial Government, 2024). In 2023, the KHLM accounted for only 5.52% of the total 16 049 equivalent full-time jobs recorded in Namakwa, the second lowest share after Kamiesberg (NDM, 2025).

Based on the data from the 2011 Census, 7% of the households in the KHLM had no formal income, 2% earned less than R4 800, 5% earned between R4 801 and R10 000 per annum, 25% earned between R10 001 and R20 000 per annum, 26% earned between R20 001 and R40 000 per annum, 14% earned between R40 001 and R75 000 per annum, 10% earned between R75 001 and R150 000 per annum, 6% earned between R150 001 and R300 000 per annum, 4% earned between R300 001 and R600 000 per annum, 1% earned between R600 001 and R 1 200 000 per annum, with none earning R 1 200 001 and over (Wazimap, 2025c)[34]. The average employee income for the KHLM is estimated at approximately R15 000 per annum, about half the amount in NDM and Northern Cape (approximately R30 000) (Wazimap, 2025c). In 2020, the KHLM had the lowest percentage of people living in poverty (40.2%), compared to the other municipalities within the NDM (see Figure 3.45). In 2022, the NDM recorded the lowest percentage of people living in poverty (38.2%) compared to the other districts within the Northern Cape.

[32] Municipalities of South Africa (2025a). *Karoo Hoogland Local Municipality (NC066).* [Online] Available from: https://municipalities.co.za/demographic/1169/karoo-hoogland-local-municipality [Accessed September 2025].
[33] Namakwa District Municipality (2025). *Final Revised Integrated Development Plan 2025/2026.* [Online] Available at: https://www.namakwa-dm.gov.za/wp-content/uploads/2025/06/Namakwa-DM-Council-Approved-Final-IDP-2025-2026-18-Jun-2025.pdf [Accessed: September 2025].
[34] Wazimap (2025c). *Karoo Hoogland, Northern Cape*. [Online]. Available at: https://wazimap.co.za/profiles/municipality-NC066-karoo-hoogland/ [Accessed: September 2025].

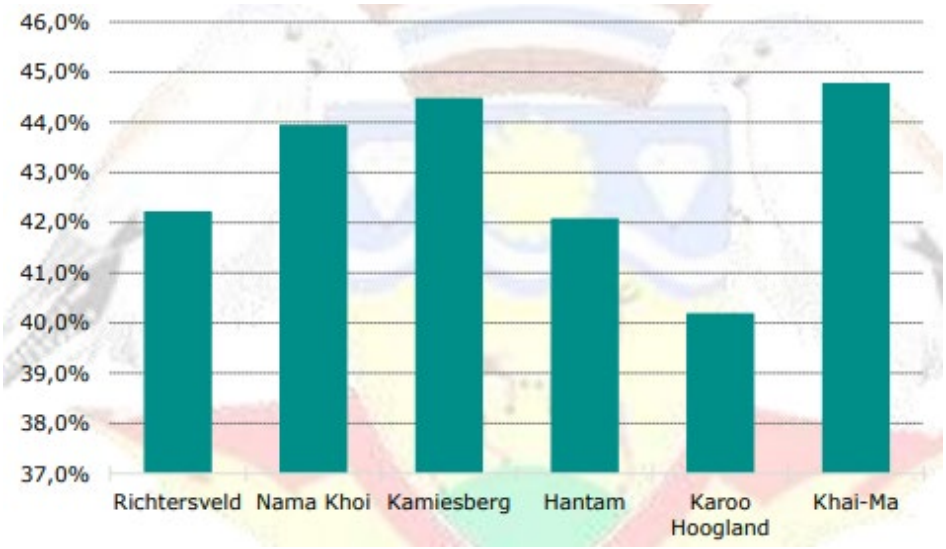


Figure 3.45: Percentage of people living in poverty across the local municipalities of the NDM in 2020 (Source: NDM, 2022)[35].

Household income levels in the KHLM are likely to have been impacted by the COVID-19 pandemic. The number of households in the KHLM and NDM that live close to or below the poverty line is also likely to have increased over the last three to five years. This, coupled with the high dependency ratio for the KHLM, is a major cause of concern for the area. Higher dependency ratios are indicative of the limited employment opportunities in the area and also highlights the importance of maximising local employment opportunities and the key role played by training and skills development programmes.

3.3.2.4 Health and Community Services

The KHLM is served primarily by community health centres and mobile health units, as no hospitals are located within its large, sparsely populated area. Residents typically travel to district health centres in nearby towns for complex or emergency care (KHM, 2024)[28]. According to National Treasury (2021)[36], as of 2019, the KHLM has three community health centres (including day care centres and midwife obstetric units), two other primary healthcare centres (including environmental health services, mobile services and occupational health centres) and three other health facilities (including emergency medical stations, frail care services, forensic pathology, laboratories, hospices, pharmacies, places of safety, etc). According to National Treasury (2021), Human Immunodeficiency Virus (HIV) prevalence in the KHLM increased from 2 480 to 3 374 between 2016 and 2019, while the number of patients starting Antiretroviral treatment (ART) declined from

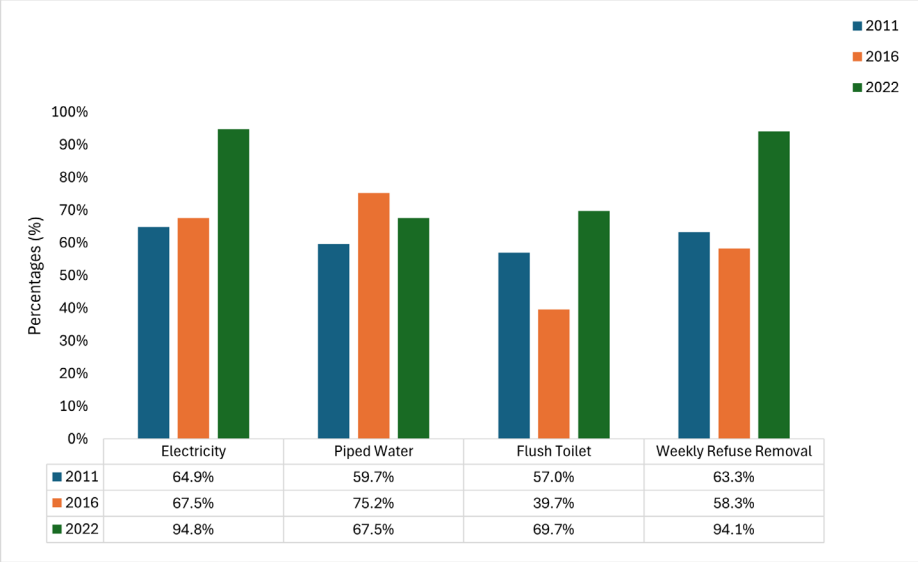
[35] Namakwa District Municipality (2022). *Integrated Development Plan 2022 – 2027.* [Online] Available at: https://www.namakwa-dm.gov.za/wp-content/uploads/2022/07/NDM-Council-Approved-IDP-2022-2027-28-Jun-2022.pdf [Accessed 30 July 2025].
[36] National Treasury (2021). *Municipal Socio-Economic Profile: Karoo Hoogland, Northern Cape.* Pretoria: National Treasury, Republic of South Africa. [Online] Available from: *https://lg.treasury.gov.za/ibi_apps/rs/ibfs/WFC/Repository/Public/Municipal_Socio-Economic_Profiles/Profiles/Municipal_Profiles/Northern_Cape/Karoo-Hoogland.pdf* [Accessed 03 August 2025].

46 to 31 between 2016 and 2019. ART coverage in the province increased from 54.9% in 2017 to 86.1%, though program access in remote KHLM communities remains uneven (OFM, 2024)[37].

3.3.2.5 Municipal Services

Access to formal dwellings remains high, with 96% of households residing in formal housing in 2022, a slight decline from 99.4% in 2016 but consistent with 2011 levels (96.9%). In terms of household ownership, 68.1% of houses were owned or being paid off by 2016, suggesting growing residential securing, although recent ownership figures are unavailable.

According to StatsSA (2025) and the KHM (2024), service delivery in the KHLM improved between 2016 and 2022. Electricity for lighting increased from 67.5% in 2016 to 94.8% in 2022; flush toilets connected to sewerage increased from 39.7% in 2016 to 69.7% in 2022; piped water decreased from 75.2% in 2016 to 67.5% in 2022; and weekly refuse removal availability increased from 58.3% in 2016 to 94.1% in 2022 (Figure 3.46).



	Electricity	Piped Water	Flush Toilet	Weekly Refuse Removal
2011	64.9%	59.7%	57.0%	63.3%
2016	67.5%	75.2%	39.7%	58.3%
2022	94.8%	67.5%	69.7%	94.1%

Figure 3.46: Percentage of households with access to basic services within the KHLM (Redrawn based on KHM, 2024; KHM, 2025; StatsSA, 2025)

3.3.3 Regional Context – Central Karoo District Municipality

The CKDM is located in the northern part of the Western Cape Province. The CKDM is also a Category C municipality and covers an area of 38 854 km^2, which is approximately 28% of the Western Cape (CKDM, 2025)[38]. The district is made up of three local municipalities, namely, the Laingsburg, Prince Albert and Beaufort West Local Municipalities.

[37] OFM (2024). *Northern Cape placed second lowest for HIV prevalence in South Africa*. [Online]. Available at: https://www.ofm.co.za/article/centralsa/333940/northern-cape-placed-second-lowest-for-hiv-prevalence-in-south-africa [Accessed 03 August 2025].
[38] Central Karoo District Municipality (2025). *Final Integrated Development Plan: 3rd Amendment 2025/2026*. [Online] Available from: https://www.skdm.co.za/sites/default/files/documents/Final%20Amendment%20IDP%202025-2026%20-%20May%202025%20%27bk_0.pdf [Assessed 18 September 2025].

3.3.3.1 Demographics and Economic Profile

According to StatsSA (2025), the CKDM recorded a population of 71 011 in 2011, which increased significantly to 102 173 in 2022 (Table 3.9). This represents a population growth rate of 3.5% per annum between 2011 and 2022 (Western Cape Government, 2023a)[39]. In 2022, the working-age population (15-64 years) made up the largest portion of the population at 65.9%, followed by young children (0-14 years) at 27.6%, while the elderly age group (65 years and older) accounted for only 6.5% of the total population (StatsSA, 2025). The dependency ratio decreased from 58.0 in 2011 to 51.8 in 2022, indicating a growing working-age population and a declining dependent population group (Western Cape Government, 2023a). In terms of race groups in 2022, Coloureds were the dominant race group in the CKDM, making up approximately 80.7% of the population, followed by Black Africans (11.9%), Whites (5.6%), Other (1.4%) and Indians/Asians (0.3%) (StatsSA, 2025). The most widely spoken language in the CKDM in 2011 was Afrikaans (85.72%), followed by isiXhosa (8.34%) and English (1.75%), with other languages making up 0.35% (WESGRO, 2024)[40].

Table 3.9: Total population of the CKDM, BWLM, Western Cape, and National for the period 2011 – 2022 (Sources: StatsSA, 2025).

Region → / Year ↓	CKDM	BWLM	Western Cape	National Total	BWLM as a % of the CKDM	BWLM as a % of the province	BWLM as a % of national
2011	71 011	49 586	5 822 734	51 770 560	69.83%	0.85%	0.096%
2022	102 173	72 972	7 433 020	62 027 503	71.42%	0.98%	0.118%

In 2021, the CKDM contributed 0.5% (R3.8 billion) to the GDP of the Western Cape Province (Western Cape Government, 2023a). The general government and community services economic sectors were the largest contributors to the Regional GDP (GDPR), collectively contributing 39.0% of the GDPR of the CKDM in 2021, followed by agriculture (15%), and trade and finance (13% each) (Western Cape Government, 2023a). In 2023, the CKDM contributed R2.994 billion to the GDP of the Western Cape Province (CKDM, 2025) which was lower than its 2021 provincial GDP contribution. The CKDM experienced an economic growth of 0.4% in 2023, with agriculture, transport, and public services being the key contributors to the CKDM's economy in 2023 (CKDM, 2025). According to WESGRO (2024), in terms of economic activities in the CKDM in 2023, the largest contributing economic sector was the community, social and personal services sector, which accounted for 19.56% (R574.98 million) of the CKDM's GVA; followed by agriculture, forestry and fishing, which accounted for 17.50% (R514.39 million) of the CKDM's GVA; and the transport, storage and communication sector, which accounted for 14.74% (R433.45 million) of the CKDM's GVA.

[39] Western Cape Government (2023a). *#KnowYourMunicipality: The 2023 Socio-Economic Profile.* Central Karoo District Municipality. [Online] Available from: https://capechamber.co.za/sites/default/files/2024-09/Central%20Karoo%20District%20Municipality%20SEP-LG%202023.pdf [Accessed 17 September 2025].
[40] WESGRO (2024). *District: Central Karoo.* [Online] Available from: https://www.wesgro.co.za/uploads/files/Wesgro-Research_Central-Karoo-District-Factsheet_2024.09.pdf [Accessed 17 September 2025].

3.3.3.2 Social Characteristics

The CKDM's unemployment rate significantly increased from 25.60% in 2022 to 29.87% in 2023 (Western Cape Government, 2023a; WESGRO, 2024). The CKDM's unemployment rate in 2023 was also significantly higher than that of the Western Cape (21.77%) (WESGRO, 2024). According to the Western Cape Government (2023a), in terms of employment in the CKDM in 2022, 78.6% of workers were employed in the formal sector, while 21.4% of workers were informally employed. In terms of total employment (formal and informal) by sector in 2023, the agriculture, forestry and fishing sector employed the most workers in the CKDM (4 729 workers), followed by the community, social and personal services sector (4 651 workers) and the wholesale and retail, catering and accommodation sector (4 076 workers) (WESGRO, 2024). In 2023, approximately 33.00% of the workforce in the CKDM were semi-skilled workers, 28.85% were low-skilled workers and 18.49% were skilled workers.

Based on the 2011 Census data, the majority of households in the CKDM (25%) earned an average income of up to R40 000 per annum, whereas 9% of households in the CKDM had no income and 3% of households earned an average income of up to R4 800 per annum (Wazimap, 2025b)[41]. The average annual income earned by households in the CKDM was R 29 400, which is about the same as the amount in Western Cape and South Africa (R29 400) (Wazimap, 2025b). In terms of wage distribution in the CKDM in 2022, individuals in low-income occupations (mainly trade and agricultural workers) earned between R3 200 and R6 400 per month (Western Cape Government, 2023b)[42]. The COVID-19 pandemic has significantly impacted economic growth in the CKDM as the lockdowns led to the closure of businesses, resulting in job losses and income reductions for most communities, which in turn led to lower consumer spending (Western Cape Government, 2023b).

In terms of dwelling types, in 2022, approximately 98.8% of households in the CKDM lived in formal dwellings which was significantly higher than that of the Western Cape Province (88.0%), whereas 0.8% of households resided in informal dwellings. No households lived in traditional dwellings, compared to that of the province (0.7%) and approximately 0.6% of households fell under the other or unspecified dwelling category (Western Cape Government, 2023a).

3.3.4 Local Context – Beaufort West Local Municipality

The BWLM is the largest local municipality in the CKDM, accounting for 56.4% of the CKDM area (21 916 km^2) (Beaufort West Municipality [BWM], 2025)[43]. The BWLM is centred around the town of Beaufort West, which serves as the administrative centre of the CKDM, and includes towns such as Merweville, Nelspoort, and Murraysburg. Table 3.10 provides an overview of various key statistics for the BWLM.

[41] Wazimap (2025b). Central Karoo, Western Cape. [Online]. Available at: https://wazimap.co.za/profiles/district-DC5-central-karoo/#households [Accessed: September 2025].
[42] Western Cape Government (2023b). *2023-2024 Municipal Economic Review Central Karoo District.* [Online] Available at: https://stanonprodmtpdxpzan.blob.core.windows.net/dxp/2024-02/2023-24%20MERO%20Central%20Karoo%20District.pdf [Accessed: September 2025].
[43] Beaufort West Municipality (2025*). Final IDP 2025-2026 Review: 5th Generation Integrated Development Plan 2022-2027.* [Online] Available at: https://www.beaufortwestmun.co.za/sites/default/files/documents/FINAL%20DRAFT%20IDP%20REVIEW%20-%202025-2026%20-%2030%20May2025.pdf [Accessed August 2025]

Table 3.10: Key statistics for the BWLM for 2022, 2016, and 2011 (BWLM, 2025)

KEY STATISTICS	YEAR		
	2011	2016	2022
Total population	49 586	51 080	72 972
Young children (under 15 years)	31.5%	26.6%	27.7%
Working age (15 to 64 years)	62.6%	66.5%	65.8%
Elderly (65 years and older)	5.9%	6.9%	6.5%
Dependency ratio	59.7	50.5	52.0
Gender ratio	94.8	92.7	91.4
Growth rate	n/a	0.67%	3.75%
No schooling aged 20+	10.1%	5.4%	5.2%
Higher education aged 20+	6.3%	3.8%	6.8%
Matric aged 20+	23.6%	31.8%	n/a
Number of households	13 088	14 935	19 216
Average household size	3.8	3.4	3.8
Female headed households	37.7%	39.8%	n/a
Formal dwellings	97.9%	99.6%	99.4%
Housing owned/paying off	60.7%	66.4%	n/a
Flush toilet connected to sewerage	92.4%	95.3%	98.0%
Weekly refuse removal	83.7%	91.7%	79.6%
Piped water inside dwelling	81.3%	77.9%	87.2%
Electricity for lighting	92.0%	96.0%	97.3%

3.3.4.1 Demographics and Economic Profile

The BWLM population showed a significant growth from 49 586 in 2011 to 51 080 in 2016, reaching 72 972 in 2022, corresponding to an average growth rate of 3.75% (Table 3.10). Despite the population growth from 2011 to 2022, in 2020 the population density of the BWLM was 2 people per km^2, which was significantly lower compared to the CKDM which was 15 persons per km^2 (Western Cape Government, 2021)[44]. In terms of age distribution in 2022, approximately 27.7% of the population in the BWLM were under the age of 15, approximately 65.8% were between the ages of 15 and 64 years, and approximately 6.5% were 65 years and older (Figure 3.47). These figures confirm a relatively young and potentially active workforce but also highlight dependency pressures.

[44] Western Cape Government (2021). *Socio-Economic Profile: Beaufort West Municipality.* [Online] Available from: https://www.westerncape.gov.za/provincial-treasury/sites/provincial-treasury.westerncape.gov.za/files/atoms/files/SEP-LG%202021%20-%20Beaufort%20West%20Municipality.pdf [Accessed 03 August 2025]

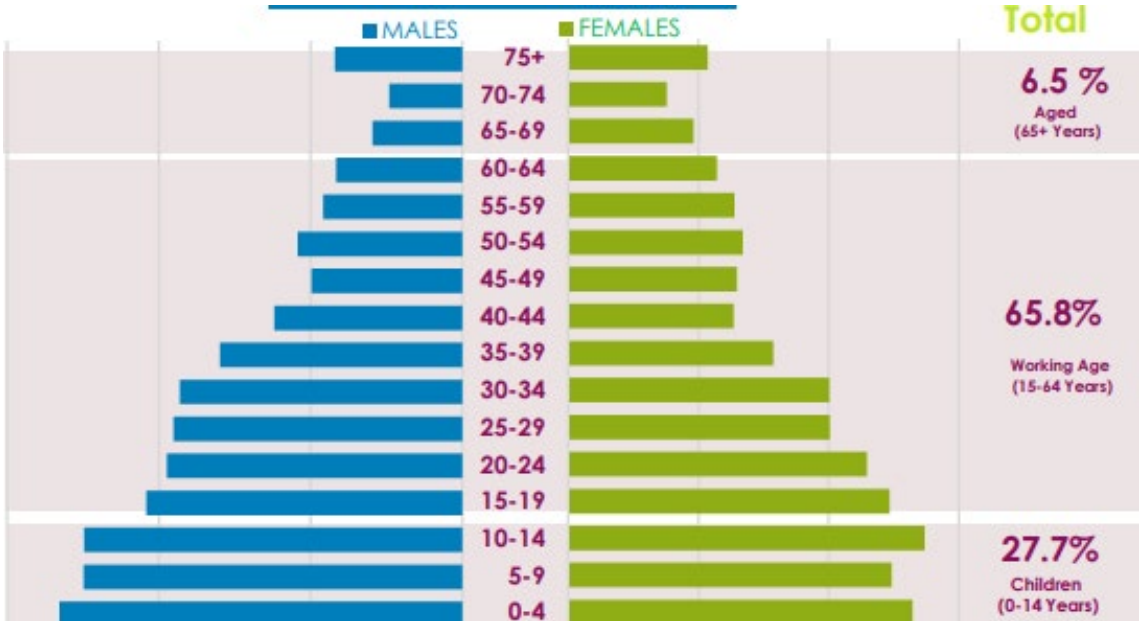


Figure 3.47: Population by age group in the BWLM (Source: Western Cape Government, 2021)

In terms of race groups, Coloureds made up approximately 77.4% of the population in the BWLM, followed by Black Africans (15.7%), Whites (4.9%), Indians/Asians (0.4%), Other (1.4%) and Unspecified (0.2%) (BWLM, 2025). In 2016, the main language spoken within the BWLM was Afrikaans (83.0%), followed by isiXhosa (13.1%), and English (1.9%) (BWLM, 2025).

The BWLM is the economic hub of the CKDM and contributed 69.8% (or ~R2.089 million) to the CKDM's GDP in 2023 (MERO, 2024 cited in Appendix G.8 of this EIA Report). In 2023, the tertiary sector was the largest contributor to the BWLM's economy, accounting for 65.9% of the total GDP (Western Cape Government, 2024)[45]. The community and personal services sector was the largest contributor within the tertiary sector, accounting for 19% of the GDP, followed by finance, insurance, real estate and business services (18%), transport, storage, and communication (16%), agriculture, forestry, and fishing (14%), and trade, catering, and accommodation (12%) (Western Cape Government, 2024; cited in Appendix G.8 of this EIA Report).

3.3.4.2 Education

Education levels in the BWLM indicate gradual improvement over the years. In 2016, 31.8% of individuals aged 20 and older had completed matric, with 5.4% having no formal schooling, and only 3.8% achieved higher education (Table 3.10). By 2022, the no-schooling rate fell slightly to 5.2%, while higher education attainment rose to 6.8%, suggesting modest gains in post-secondary access. In 2020, the BWLM had 18 public schools, 14 of which are no-fee schools, and 17 of the schools had libraries (Western Cape Government, 2021). A total of 11 239 learners were enrolled in school within the BWLM in 2023, which decreased from 11 502 in 2022. The learner retention rate (i.e., a measure of the proportion of the learners in Grade 12 who were in Grade 10 two years prior [Western Cape Government, 2024]) increased from 59.3% in 2018 to 79.5% in 2020, which was slightly lower than the CKDM's average of 81.5% but higher than the provincial average (60.4%) (Western Cape Government, 2021).

[45] Western Cape Government (2024). *#KnowYourMunicipality: The 2024 Socio-Economic Profile.* [Online] Available from: https://dxp.westerncape.gov.za/treasury/socio-economic-profiles-2024 [Accessed August 2025]

Only 23% of households in the BWLM have access to the internet, suggesting limited opportunities to participate in today's increasingly online world and associated educational and employment opportunities (cited in Appendix G.8 of this EIA Report).

3.3.4.3 Employment and Income

The BWLM continues to serve as the administrative and economic hub of the CKDM, yet it faces persistent challenges in employment and income distribution. According to the Western Cape Government (2024), the BWLM's unemployment rate was 24.20% in 2023, which was lower than that of the CKDM (25.60%) but higher than that of the Western Cape (21.77%) (Western Cape Government, 2023a; Western Cape Government, 2024; WESGRO, 2024).

According to Western Cape Government (2022)[46], the BWLM employed approximately 11 477 workers in 2020, of which 79.2% were employed in formal sector while 20.8% were informally employed. The formally employed workforce was dominated by semi-skilled (40.4%) and low-skilled (35.6%) workers, while skilled workers accounted for 24.0% in 2020 (Western Cape Government, 2022). In 2023, the labour force comprised approximately 11 197 employed individuals, maintaining the same division between formal and informal employment, about 82.2% versus 17.8%, respectively (Western Cape Government, 2024; BWLM, 2025). In 2021, the BWLM experienced a low labour absorption rate of approximately 34.3%, with 51.8% of the population not economically active (BWLM, 2025). Despite the economic recovery experienced in 2021, the net job losses in the BWLM totalled 41, largely concentrated in the agriculture, fishing and forestry (-70 jobs); general government (-52 jobs); and electricity, gas and water sectors (-42 jobs) (Western Cape Government, 2024; BWLM 2025).

In 2023, the BWLM had approximately 12 319 employed individuals, with 79.4% in formal jobs and 20.6% in informal jobs (BWLM, 2025). Among formal workers, semi-skilled labourers comprised 40.7%, low-skilled accounted for 34.6%, and skilled workers made up 24.7% of the total formal employment (BWLM, 2025), highlighting the limited presence of high-paid, professional roles in the local workforce. Despite being a regional economic hub, the municipality's labour absorption rate remained low at 25% in 2023, while 62.7% of residents were not economically active (BWLM, 2025).

In 2022, the BWLM recorded the highest median monthly income in the CKDM at R9 812. Individuals earning between R25 600 and R51 200 per month accounted for 15.9% of workers in the BWLM, which was higher than that of the CKDM (13.8%) (Western Cape Government, 2023b). However, income distribution remains highly skewed as in 2022, approximately 14.4% of workers earned less than R3199, approximately 25.0% earned between R3 200 and R6 400; approximately 20.8% earned between R6 401 and R12 800; approximately 20.7% earned between R12 801 and R25 600; and approximately 18.9% earned above R25 601 (Western Cape Government, 2023b). With respect to poverty, according to the Western Cape Government (2024), the Upper Bound Poverty Line (UBPL) (i.e., the proportion of individuals living below the UBPL and that cannot afford to buy adequate food and non-food items), in 2023, 83.7% of the population in the BWLM were

[46] Western Cape Government (2022). *#KnowYourMunicipality: The 2022 Socio-Economic Profile.* [Online] Available from: https://www.westerncape.gov.za/provincial-treasury/sites/provincial-treasury.westerncape.gov.za/files/atoms/files/Beaufort%20West%20Municipality%20SEP-LG%202022.pdf [Accessed September 2025]

living below the UBPL. This highlights the critical need for job creation and skills development in the area.

3.3.4.4 Health and Community Services

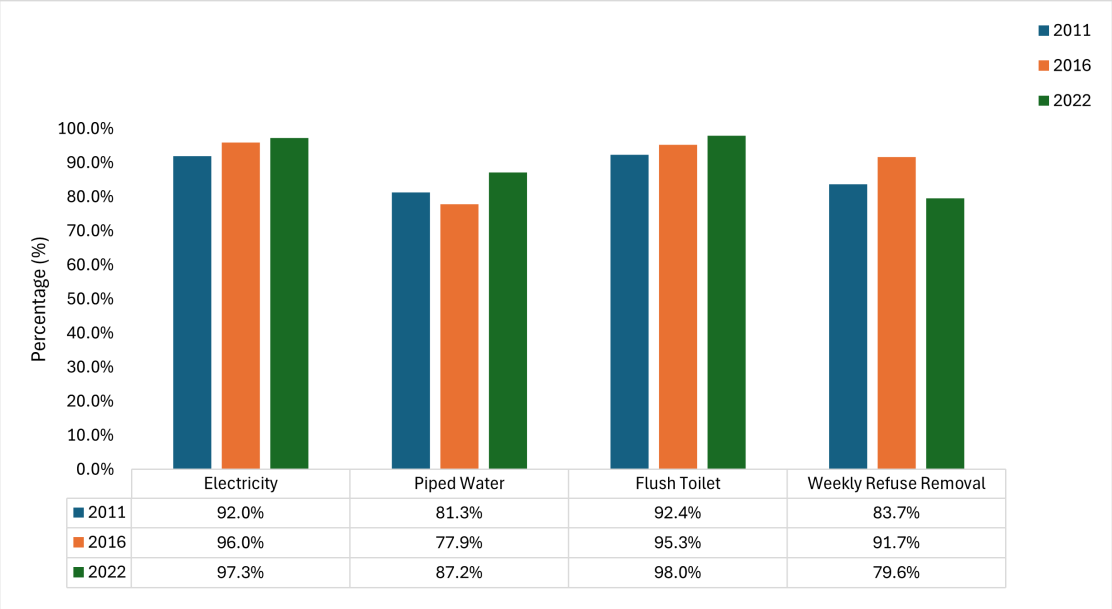
According to the Western Cape Government (2024), in 2023 the BWLM was equipped with five primary healthcare facilities, five mobile/satellite clinics, two district hospitals, eight ART treatment sites and seven TB clinics. The BWLM is also serviced by 8 ambulances, which translates to 0.6 ambulances per 10 000 residents in 2023 (Western Cape Government, 2024).

The number of patients receiving ART in the BWLM increased from 1 572 patients in 2022/2023 to 1 958 patients in 2023/2024. The number of patients receiving TB treatment also increased from 465 registered patients in 2022/2023 to 504 registered patients in 2023/2024, indicating a proactive approach to identifying and treating individuals with TB within the BWLM (Western Cape Government, 2024).

3.3.4.5 Municipal Services

According to the BWLM (2025), access to basic services is particularly robust as 99.8% of households have water, 99.6% have formal housing, 97.2% have electricity, and 79.5% receive refuse removal. In terms of dwelling types, in 2022, 99.4% of households in the BWLM resided in formal dwellings, followed by, 0.4% in informal dwellings, and 0.2% resided in traditional dwellings (StatsSA, 2025).

According to the BWLM (2025), the proportion of households with flush toilets connected to sewerage increased from 92.4% in 2011 to 98.0% in 2022 and households with electricity for lighting also increased from 92.0% in 2011 to 97.3% in 2022 (Figure 3.48). The proportion of households with piped water inside dwelling decreased from 81.3% in 2011 to 77.9% in 2016 but increased again to 87.2% in 2022 and weekly refuse removal increased from 83.7% in 2011 to 91.7% in 2016 but decreased again to 79.6% in 2022 (Figure 3.48).



	Electricity	Piped Water	Flush Toilet	Weekly Refuse Removal
2011	92.0%	81.3%	92.4%	83.7%
2016	96.0%	77.9%	95.3%	91.7%
2022	97.3%	87.2%	98.0%	79.6%

Figure 3.48: Percentage of households with access to basic services within the BWLM (Redrawn based on BWLM, 2025)

3.3.5 Regional Context – Pixley ka Seme District Municipality

The PKSDM is situated in the south-eastern part of the Northen Cape Province. It is one of five district municipalities in the Northern Cape and is the second largest by area, covering approximately 103 410 km^2 (Pixley ka Seme District [PKSD], 2025)[47]. The district comprises eight local municipalities, namely, Emthanjeni, Kareeberg, Renosterberg, Siyancuma, Siyathemba, Thembelihle, Ubuntu, and Umsobomvu and seven main towns within these municipalities, namely, Douglas, Prieska, Carnarvon, Victoria West, Colesberg, Hopetown and De Aar (PKSD, 2025).

3.3.5.1 Demographics and Economic Profile

According to StatsSA (2024), the PKSDM had a population of 186 351 in 2011, which increased to 216 589 in 2022 (Table 3.11), representing a positive population growth rate of 1.5% per annum which was slightly below that of the Northern Cape (1.6%) and the national growth rate (1.8%) over the same period. In 2022, the population in the PKSDM was predominately of working age. Specifically, 28.6% of people were aged 0-14 years, 64.8% were 15-64 years, and 6.7% were 65 years and older. The dependency ratio decreased from 60.4 in 2011 to 54.4 in 2022, reflecting a reduced burden on the economically active population (StatsSA, 2024). In terms of race groups, in 2022, Coloureds comprised 59.5% of the population, followed by Black Africans (29.8%), Whites (9.9%), Indians/Asians (0.8%), and Other (0.1%) (StatsSA, 2024). The main languages spoken in the PKSDM in 2022 was Afrikaans (77.01%), followed by isiXhosa (16.26%) and English (1.22%) (Wazimap, 2025d)[48].

[47] PKSD (2025). *Pixley Ka Seme District Final Integrated Development Plan (IDP) 2022-2027 (2025/26 3rd Review).* [Online] Available at: https://pksdm.gov.za/idps/PIXLEY%20KA%20SEME%20DISTRICT%20FINAL%20%20IDP%202025-2026.pdf [Assessed 17 August 2025].

[48] Wazimap (2025d). *Pixley Ka Seme District Municipality, Northern Cape.* [Online]. Available at: https://next.wazimap.co.za/?geo=NC [Assessed: September 2025].

Table 3.11: Total population of the PKSDM, ULM, Northern Cape, and National for the period 2011 – 2022 (Sources: StatsSA, 2025).

Region → / Year ↓	PKSDM	ULM	Northern Cape	National Total	ULM as a % of the PKSDM	ULM as a % of the province	ULM as a % of national
2011	186 351	18 601	1 145 861	51 770 560	9.98%	1.62%	0.036%
2022	216 589	15 836	1 355 945	62 027 503	7.31%	1.17%	0.026%

The PKSDM is a significant contributor to the Northern Cape economy, with a GDP of R22.3 billion in 2023, up from R11.1 billion in 2013, representing a contribution of 14.72% to the provincial GDP and a contribution of 0.32% to South Africa's total GDP in 2023 (PKSD, 2025). The PKSDM achieved an annual GDP growth rate of 2.67% in 2023, exceeding both the provincial (0.69%) and national (1.91%) GDP growth rates (PKSD, 2025). The long-term average GDP growth rate for the PKSDM (1.97%) was also significantly higher than that of South Africa (0.73%), with the economic growth in the PKSDM peaking in 2021 (6.80%) (PKSD, 2025). In 2023, the PKSDM's economy was dominated by the community services sector, accounting for 36.3% of the total GVA, followed by agriculture (14.9%) and finance (13.5%), with mining contributing the least to the PKDSM's economy in 2023 (1.56%) (PKSD, 2025).

3.3.5.2 Social Characteristics

According to the PKSD (2025), the district had an official unemployment rate of 24.57% in 2023, which was lower than that of the Northen Cape (25%) and the national unemployment rate (32.64%) in 2023. The district experienced an average annual decrease in unemployment of -1.29% since 2013, compared to -0.40% for the province.

Based on the 2001 and 2011 Census data, the average household income in the PKSDM increased from approximately R37 538 in 2001 to approximately R75 237 in 2011 (StatsSA, 2011)[49]. While this shows a significant growth over the decade, the PKSDM remains below the provincial average household income of R39 757 in 2001 and R86 158 in 2011 (StatsSA, 2011), indicating that households in the PKSDM generally earn less than the provincial average. According to the StatsSA 2016 Provincial Profile Northern Cape Community Survey of 2016, the PKSDM had the second highest prevalence of households that ran out of money to buy food in the 12 months preceding the 2016 Community Survey in the Northern Cape at 28.7%, which was higher than that of the Northern Cape (27.6%) and South Africa (19.9%) (StatsSA, 2016)[50].

According to Census 2022 data, approximately 85.6% of households in the PKSDM resided in formal dwellings in 2022, while approximately 13.4% lived in informal dwellings. Approximately 0.4% of the households lived in traditional dwellings in 2022, with approximately 0.5% living in

[49] Statistics South Africa (2011). *Census 2011 Municipal report Northern Cape.* Report No. 03-01-51. [Online]. Available at: https://www.statssa.gov.za/census/census_2011/census_products/NC_Municipal_Report.pdf [Accessed 17 September 2025].
[50] Statistics South Africa Community Survey (2016). *Provincial Profile: Northern Cape Community Survey 2016*. Report 03-01-14. [Online]. Available at: https://cs2016.statssa.gov.za/wp-content/uploads/2018/07/NorthernCape.pdf [Accessed: September 2025].

other dwelling types (StatsSA, 2024)[51]. This distribution is broadly aligned with that of the Northern Cape Province, where 85.9% of households lived in formal dwellings, 12.1% in informal dwellings, 1.4% in traditional dwellings, and 0.6% in other dwelling types (StatsSA, 2024).

3.3.6 Local Context – Ubuntu Local Municipality

The ULM is located within the PKSDM in the Northern Cape and covers an area of approximately 20 389 km^2, making it one of the largest municipalities in the district by land size (ULM, 2024)[52]. The municipality comprises five main towns, namely, Victoria West, Loxton, Richmond, Merriman and Hutchinson. Table 3.12 provides an overview of various key statistics for the ULM.

Table 3.12: Key statistics for the ULM for 2022, 2016, and 2011 (ULM, 2024; StatsSA, 2016; StatsSA, 2025; Municipalities of South Africa, 2025b[53])

KEY STATISTICS	YEAR		
	2011	2016	2022
Total population	18 601	19 471	15 836
Young children (under 15 years)	33.3%	27.7%	29.3%
Working age (15 to 64 years)	61.1%	66.8%	64.1%
Elderly (65 years and older)	5.6%	5.5%	6.5%
Dependency ratio	63.5	49.7	55.9
Gender ratio	98.4	101.1	93.8
Growth rate	No data	1.04%	-1.56%
No schooling aged 20+	16.4%	12.0%	9.6%
Higher education aged 20+	5.9%	3.9%	7.7%
Matric aged 20+	18.7%	23.5%	No data
Number of households	5 129	6 034	3 990
Average household size	3.6	3.2	4.0
Female headed households	34.6%	33.7%	No data
Formal dwellings	87.6%	92.9%	94.9%
Housing owned/paying off	54.7%	68.8%	No data
Flush toilet connected to sewerage	74.3%	74.6%	92.5%
Weekly refuse removal	66.6%	74.9%	79.2%
Piped water inside dwelling	49.2%	46.3%	65.2%
Electricity for lighting	84.8%	89.6%	90.9%

3.3.6.1 Demographics and Economic Profile

The total population of the ULM declined from 19 471 in 2016 to 15 836 in 2022 (Table 3.12), which could potentially be attributed to the younger population migrating to urban centres in search of better economic opportunities and access to services. Correspondingly, the dependency ratio increased from 49.7% in 2016 to 55.9% in 2022 reflecting the limited employment opportunities in

[51] Statistics South Africa (2024). *Provincial Profile: Northern Cape.* [Online] Available from: https://www.statssa.gov.za/publications/Report-03-01-72/Report-03-01-722022.pdf#:~:text=The%20Northern%20Cape%20is%20the%20largest%20province%20by,in%20the%20province%20followed%20by%20Setswana%20and%20IsiXhosa [Accessed 30 July 2025].
[52] Ubuntu Local Municipality (2024*). Final 2024/25 IDP.* [Online] Available at: https://www.ubuntu.gov.za/index.php/documents/category/136-ubuntu-idp-2024-2025?download=1052:final-idp-2024-2025 [Accessed 26 August 2025].
[53] Municipalities of South Africa (2025b). *Ubuntu Local Municipality (NC071).* [Online]. Accessed from: https://municipalities.co.za/demographic/1179/ubuntu-local-municipality [Accessed 02 September 2025]

the area. In 2022, approximately 29.3% of the population within the ULM were under the age of 15 years, while the working-age cohort (15-64 years) constituted approximately 64.1% in 2022. The elderly population (65 years and older) represented approximately 6.5% in 2022, an increase from 5.5% in 2016. The ULM therefore has a relatively large young population, which poses challenges in terms of the creation of employment opportunities.

In terms of racial groups, in 2022, Coloureds made up about 70.0% of the population in the ULM, followed by Black Africans (20.5%), Whites (8.5%), Indians/Asians (0.9%) and Other (0.1%) (StatsSA, 2025). In 2022, the most widely spoken languages in the ULM were Afrikaans at 81.01%, followed by isiXhosa (14.13%), and English (1.76%) (Wazimap, 2025e)[54].

3.3.6.2 Education

In terms of the highest level of education (20+ years age group) in 2011, approximately 16.4% had no formal schooling, 21.0% had some Primary education, 8.0% completed Primary School, 29.6% had some Secondary education, 18.8% had completed Matric (Grade 12), and 5.9% had attained higher education (Stats SA, 2025). In terms of highest level of education (20+ years age group) in 2022, there was an improvement as figures for no formal schooling declined to approximately 9.6%, individuals that completed Primary School slightly increased to 8.1%, individuals with some Secondary education increased to 30.9%, those with a matric increased to 27.2%, and the proportion with higher education increased to 7.7% (StatsSA, 2024). However, individuals with some Primary education decreased to 15.1%.

3.3.6.3 Employment and Income

The 2011 Census revealed that in 2011 the unemployment rate in the ULM was 29.1%, and youth unemployment rate (ages 15-34) was 34.8% (ULM, 2024). The unemployment rate of the ULM in 2011 was higher than that of the PKSDM (28.3%) and the Northern Cape (28.1%) for the same period (StatsSA, 2011). This reflects the limited employment opportunities in the area, which in turn are reflected in the low income and high poverty levels. However, the COVID-19 pandemic is likely to have resulted in an increase in unemployment rates in the ULM.

Based on the data from the 2011 Census, 12% of the households in the ULM had no formal income, 4% earned less than R4 800, 6% earned between R4 801 and R10 000 per annum, 24% earned between R10 001 and R20 000 per annum, 24% earned between R20 001 and R40 000 per annum, 13% earned between R40 001 and R75 000 per annum, 8% earned between R75 001 and R150 000 per annum, 5% earned between R150 001 and R300 000 per annum, 3% earned between R300 001 and R600 000 per annum, 1% earned between R600 001 and R 1 200 000 per annum, with none earning R 1 200 001 and over (Wazimap, 2025f)[55]. The median annual household income in the ULM was approximately R29 400, which is about the same as the amount in the PKSDM and Northern Cape in 2011 (Wazimap, 2025f). The average employee income for the ULM is estimated at approximately R15 000 per annum, about half the amount in the PKSDM and the Northern Cape (approximately R30 000) (Wazimap, 2025f). In 2011, more than 588 of the households in the ULM received no income, while 177 people had an income of less than R4800

[54] Wazimap (2025e). Ubuntu, Northern Cape. [Online]. Available at: https://next.wazimap.co.za/?geo=DC7 [Assessed: September 2025].
[55] Wazimap (2025f). *Ubuntu, Northern Cape.* [Online]. Available at: https://wazimap.co.za/profiles/municipality-NC071-ubuntu [Accessed 02 September 2025].

per month, with the town of Victoria West being more financially stable in terms of income per household compared to the other towns within the ULM (ULM, 2024).

While specific poverty rates are not publicly available, the combination of high unemployment and low household income implies significant economic vulnerability. Notably, the ULM recorded a negative population growth of -1.56% per annum between 2016 and 2022 (ULM, 2024), reflecting out-migration driven by limited economic opportunities or subsistence income levels.

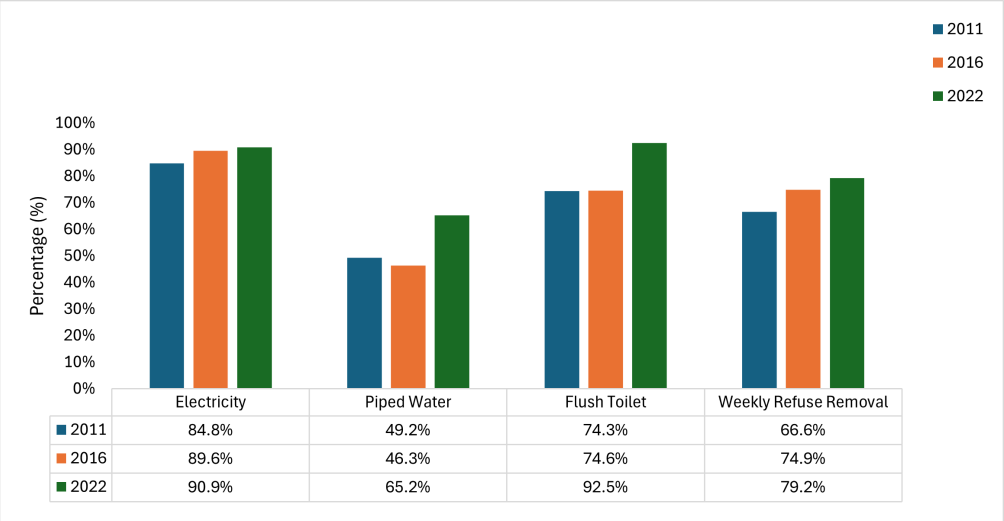
3.3.6.4 Health and Community Services

In 2015, the ULM was served by two hospitals located in Victoria West and Richmond, along with three fixed primary healthcare clinics situated in Victoria West, Richmond, and Loxton (ULM, 2024). Ambulance services are only available in Victoria West and Richmond, which may limit emergency response capacity in outlying settlements such as Merriman and Hutchinson that have no clinics, hospitals, or ambulances. According to the ULM (2024), inadequate health facilities, limited medical staff and a shortage of ambulances are some of the main issues faced by the local health sector in the ULM. In addition to healthcare, the ULM hosts a range of community and public facilities including 12 cemeteries, 8 libraries, 7 community halls, 5 recreational facilities and 2 museums (ULM, 2024).

3.3.6.5 Municipal Services

According to StatsSA (2025), between 2011 and 2022, the ULM experienced improvements in access to several essential municipal services. Electricity access for lighting increased from 84.8% in 2011 to 90.0% in 2022, piped water inside dwellings significantly increased from 49.2% in 2011 to 65.2% in 2022, flush toilets connected to sewerage systems significantly increased from 74.3% in 2011 to 92.5% in 2022, and the proportion of households receiving weekly refuse removal increased from 66.6% in 2011 to 79.2% in 2022 (Figure 3.49).

According to StatsSA (2025), in terms of the type of dwelling, in 2022, approximately 94.9% of households in the ULM lived in formal dwellings, approximately 4.7% lived in informal dwellings, approximately 0.4% lived in traditional structures, and approximately 0.1% lived in other types of dwellings. This shows a substantial progress in formal housing since 2011, when formal dwellings made up 87.6%.



	Electricity	Piped Water	Flush Toilet	Weekly Refuse Removal
2011	84.8%	49.2%	74.3%	66.6%
2016	89.6%	46.3%	74.6%	74.9%
2022	90.9%	65.2%	92.5%	79.2%

Figure 3.49: Percentage of households with access to basic services within the ULM (Redrawn based on ULM, 2024; StatsSA, 2016; StatsSA, 2025; Municipalities of South Africa, 2025b)

3.3.7 Study Area Context

The project area is remote and primarily used for small stock farming (grazing), notably sheep. Small areas are also under irrigation and produce e.g., lucerne, garlic and onions. A prolonged regional drought has significantly affected farming activities and reduced farming income. The Agricultural Compliance Statement (Appendix G.1) indicates that the proposed development offers some positive impact on agriculture by way of improved financial security for farming operations, as well as wider, societal benefits.

Very few people are employed on farms in the project area. Similarly, very few people reside permanently on the farms; those who do are primarily the landowners and their family members who have contractual agreements with the developers. Infrastructure, such as roads and communications networks, is reported to be in poor condition.

A small number of farmsteads (less than 10) and cultivated areas are located in and around the project area, primarily near ephemeral streams and farm dams. Carrying capacity, water availability and activity levels are evidently very low.

A relatively small number of other homesteads are located within ~5 km of the cluster boundaries. The nearest towns are Beaufort West (~60 km, with an estimated population of ~38 700 in 2023), Loxton (~35 km, with an estimated population of ~1 000 in 2011), Leeu Gamka (~70 km, with an estimated population of ~2 700 in 2011) and Fraserburg (~65 km, with an estimated population of ~3 000 in 2011).

3.4 Eco-Tourism Activities

The information described below is based on EIA level inputs provided by the Visual and Socio-economic Specialists, which are included in Appendix G.5 and G.8, respectively, of this EIA Report.

This study area is a known as a tourist destination owing to the presence of the Karoo National Park, a midway stop between Gauteng and Cape Town, as well as the small historic town of Beaufort West. The proposed development site is located approximately 40 km north of the Karoo National Park.

In order to avoid visual impacts on the wilderness character, experience, recreation amenity and tourism economy associated with many protected areas and tourist facilities, visual buffers are recommended to be placed around these potential sensitive receptor sites. It is recommended that large scale REF infrastructure should not be placed within the boundary of these identified or within the established buffer zones. The potential land use conflict between nature orientated tourism and the potential visual impacts associated with REFs may be mitigated to some degree by adhering to the following exclusion zone buffers:

- National Parks – 5 km buffer (not applicable to the proposed development, located more than 40 km away from the Karoo National Park)
- Nature Reserves – 3 km buffer (not applicable)
- Private reserves and game farms – 1.5 km buffer (not applicable)

Roads (especially scenic routes) are considered potential sensitive receptors whereby the travellers may be negatively impacted on by the exposure to the GEED Renewable Energy Cluster. In order to avoid encroachment of the infrastructure on public roads (especially in natural, rural and scenic areas), and thereby reducing the potential visual impact on road users and tourists, the following buffers are recommended:

- National roads – 1 km buffer
- Arterial and main roads – 500m buffer
- Secondary roads – 500m buffer

WEF is not located within the road buffers.

3.5 Civil Aviation

The Screening Tool has indicated that the study area is of low sensitivity as it relates to Civil Aviation (Figure 3.50 and Figure 3.51). The low sensitivity was verified during a site visit undertaken in August 2022; whereby no civil aviation features or installations were found within the study area. Therefore, as required by GN 320, a Civil Aviation SSV was compiled and is included in Appendix G.14 of this EIA Report. Additionally, in line with GN 320, no further requirements are applicable i.e., a Civil Aviation Compliance Statement is not required.

Figure 3.50: Civil Aviation sensitivity of the WEF study area (left) and associated power line corridor (right) (Source: Screening Tool, 2023)

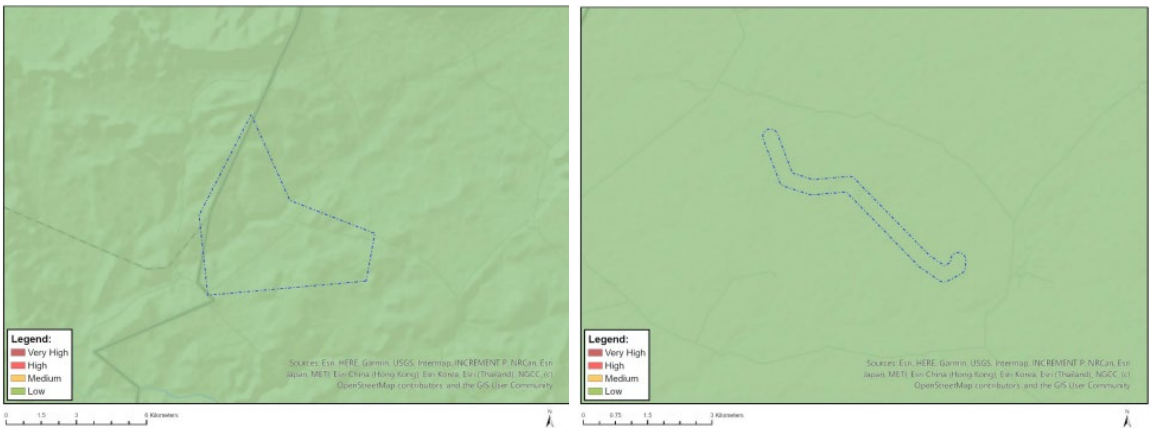


Figure 3.51: Civil Aviation sensitivity of the WEF study area (left) and associated power line corridor (right) (Source: Screening Tool, 2025)

The Air Traffic and Navigation Services SOC Limited (ATNS) data has confirmed that there is one SACAA registered aerodromes within the 30 km radius of the proposed projects. The De Panne Aerodrome (R 091) (31° 58' 45.22" S; 22° 14' 25.26" E) is located approximately 20 km southwest of the study area. The De Panne Aerodrome was not identified by the Screening Tool, thus no sensitives have been identified.

ATNS data further confirmed verified that a licensed aerodrome falls outside of the 30 km radius of the study area. The Karoo Gateway Aerodrome (International Civil Aviation Organisation Code: FABW) near Beaufort West is located approximately 65 km southeast of the study site. The actual

aerodrome will not be impacted on by the proposed development due to its distance from the proposed project.

In relation to Conventional Air Traffic Service (ATS) Routes, the proposed projects are located within Lower ATS Routes (i.e., A405 (Upper) and A405 (Lower)), as well as an Upper ATS Route (i.e., UA405 (Upper)). Two Area Navigation Routes (RNAV) flank the proposed projects roughly 20 km to the northwest and roughly 10 km to the southeast (at its closest points).

The proposed project study area was determined and verified to be of low sensitivity (as it relates to civil aviation). Figure 3.52 indicates the location of the civil aviation features noted above, which informed this Site Sensitivity Verification.

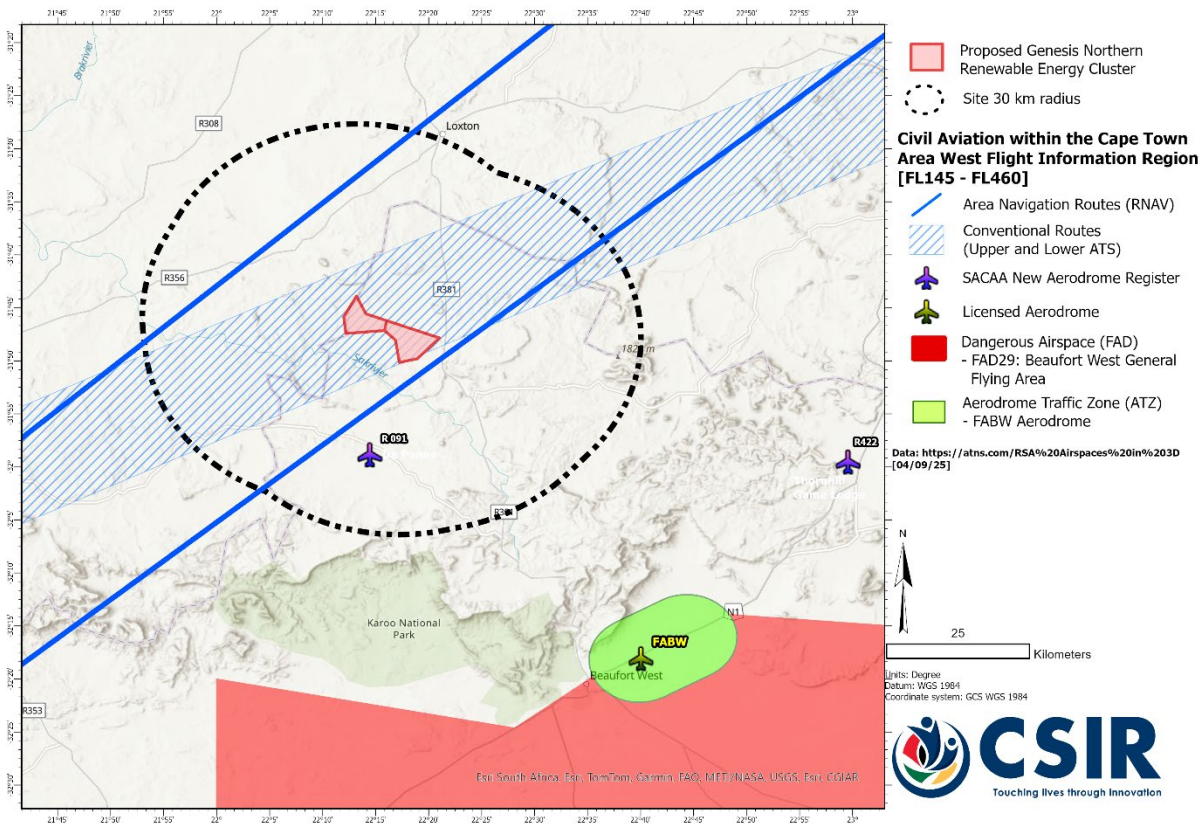


Figure 3.52 : Civil Aviation features relative to the proposed project study area based on the site visit and existing databases.

3.6 Defence

The Screening Tool has indicated that the study area is of low sensitivity as it relates to Defence (Figure 3.53 and Figure 3.54). The low sensitivity was verified during a site visit undertaken in August 2022, whereby no defence features or installations were found within the study area. Therefore, as required by GN 320, a Defence SSV was compiled and is included in Appendix G.15 of this EIA Report. Additionally, in line with GN R320, no further requirements are applicable i.e., a Defence Compliance Statement is not required.

The Screening Tool shows this area as low sensitivity in relation to the solar methodology and in relation to the general methodology for substations and power lines. Desktop research and the Screening Tool for wind turbine methodology confirm that there are no military or defence sites within a 30 km radius of the proposed project study site. Although the Screening Tool based on the general methodology for substations and EGI indicate a military and defence sites as very high sensitivity located approximately 55 km southeast (most likely a Sentech High Power Terrestrial Broadcasting Facility or telecommunication facility) of the proposed projects, the installation will not be impacted on by the proposed projects due to its vast distance from the study sites. Accordingly, the proposed project study area was determined and verified to be of low sensitivity (as it relates to defence installations).

Figure 3.54 indicates the location of the defence features noted above, which informed the SSV.

Figure 3.53: Defence sensitivity of the WEF study area (left) and associated power line corridor (right) (Source: Screening Tool, 2023)

Figure 3.54: Defence sensitivity of the WEF study area (left) and associated power line corridor (right) (Source: Screening Tool, 2025)

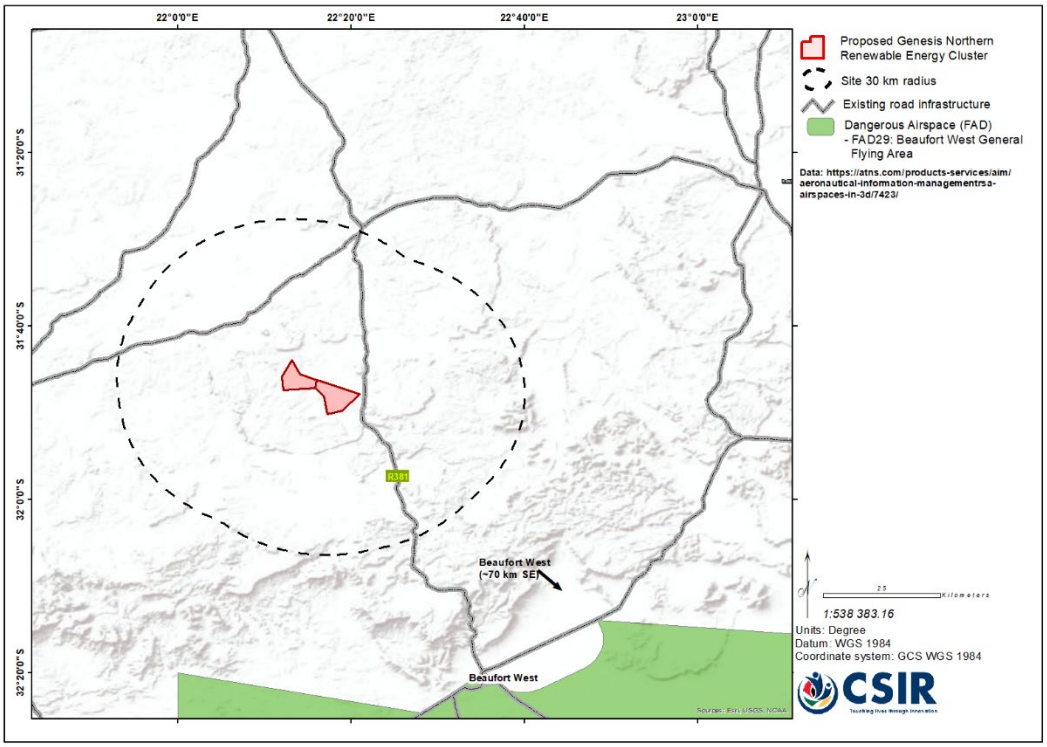


Figure 3.55: Defence features relative to the proposed project study area based on the site visit and existing databases.

genesis eco-energy DEVELOPMENTS

Scoping and Environmental Impact Assessment (S&EIA) Process for the Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 4:

Approach to EIA Process and Public Participation

CSIR
Touching lives through innovation

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4. APPROACH TO THE EIA PROCESS AND PUBLIC PARTICIPATION

This chapter gives particular attention to the legal context and guidelines that apply to this Environmental Impact Assessment (EIA) for the proposed Genesis Eland Wind Energy Facility (WEF) (hereafter referred to as the "Eland WEF" or "proposed project"), and the steps in the Public Participation Process (PPP) of the EIA Phase of the process[1], in accordance with Regulations 41, 42, 43 and 44 of Government Notice (GN) R326 of the 2014 National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) EIA Regulations (as amended), and the schedule for the Scoping and EIA Process.

The EIA Phase is shaped by the findings of the Scoping Process. For information from the Scoping Phase, including the approach to stakeholder engagement, identification of issues, overview of relevant legislation, and key principles and guidelines that provide the context for this EIA Process, refer to the Final Scoping Report (FSR) (CSIR, 2023[2]).

4.1 Purpose of EIA and Requirements of the EIA Regulations

As captured in Section 2 of Appendix 3 of the 2014 NEMA EIA Regulations (as amended), which specifies the content requirements for EIA Reports, "*the purpose of the EIA Phase is to, through a consultative process:*

- *Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;*
- *Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;*
- *Identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;*
- *Determine the:*
    - *nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and*
    - *degree to which these impacts: (aa) can be reversed; (bb) may cause irreplaceable loss of resources, and (cc) can be avoided, managed or mitigated;*
- *Identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;*
- *Identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;*

[1] Note that an integrated PPP is being undertaken for the Genesis Windy Plains and Eland WEFs, hence in some cases this is referred to as "proposed projects".

[2] CSIR, 2023. Scoping and Environmental Impact Assessment (EIA) Process for the proposed development of the Genesis Eland Wind Energy Facility and associated infrastructure, near Beaufort West in the Western Cape Province. Scoping Report. CSIR Report Number: CSIR/SPLS/SE/ER/2023/1001/B+

- *Identify suitable measures to avoid, manage or mitigate identified impacts; and*
- *Identify residual risks that need to be managed and monitored*."

The EIA Phase consists of three parallel and overlapping processes:

- Central assessment process through which inputs are integrated and presented in an EIA Report that is submitted for comment to the National Department of Forestry, Fisheries and the Environment (DFFE) and other commenting authorities; and thereafter submitted to the DFFE for decision-making;
- Undertaking of a PPP whereby findings of the EIA Phase are communicated and discussed with Interested and Affected Parties (I&APs) and responses are documented; and
- Undertaking of specialist assessments that provide additional information or assessments required to address the issues raised in the Scoping Phase.

The EIA process is a planning, design and decision-making tool used to demonstrate to the responsible authority, the DFFE, and the Project Applicant, what the consequences of their choices will be in biophysical, social, and economic terms. As such it identifies potential impacts (negative and positive) that the project may have on the environment. The EIA makes recommendations to mitigate negative impacts and enhance positive impacts associated with the proposed project.

4.2 Legislation, Policies and Guidelines Pertinent to this EIA

The scope and content of this EIA Report have been informed by the main legislation, policies, guidelines and information series documents described in this section. Additional information on applicable legislation is provided in the Specialist Assessments included in Appendix G of this EIA Report.

4.2.1 National Legislation

4.2.1.1 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 study area.

4.2.1.2 NEMA and EIA Regulations

Chapter 1, Section 2 of the NEMA sets out several 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 many 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.

Section 24 (1) of the NEMA, as amended states that "*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 EA*". The reference to "listed activities" in Section 24 (1) of NEMA relates to the regulations promulgated in GN R982, R983, R984 and R985 in Government Gazette (GG) 38282, dated 4 December 2014, which came into effect on 8 December 2014. These were amended in GN R326, R327, R325 and R324 in GG 40772, dated 7 April 2017. GN R326 contains the regulations for the Environmental Assessment Process. GN R327 and GN R324 includes listed activities that trigger the need for a Basic Assessment (BA) Process, whereas GN R325 includes listed activities that trigger the need for a full Scoping and EIA Process.

The 2014 NEMA EIA Regulations (as amended) were further amended as follows:

- GG 41766, GN 706 on 13 July 2018;
- GG 43358, GN 599 on 29 May 2020;
- GG 44701, GN 517 on 11 June 2021; and
- GG 45999, GN 1816 on 3 March 2022.

Based on the transitional arrangements, these amendments (where they have been commenced with) apply to the proposed project as the Application for Environmental Authorisation (EA) was not submitted before the above amendments took effect (where relevant). The relevant amendments have been taken into consideration in this Scoping and EIA Process.

In terms of the NEMA and the 2014 NEMA EIA Regulations (as amended), a Scoping and EIA Process is required for the proposed project. Refer to Section 4.3 of this chapter for additional information on the 2014 NEMA EIA Regulations (as amended).

4.2.1.3 GN 960 (published 5 July 2019)

GN 960 was published on 5 July 2019 and came into effect for compulsory use of the National Web Based Environmental Screening Tool (hereafter referred to as the Screening Tool) from 4 October 2019. The notice outlines the requirement to submit a report generated by the 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 proposed project was run through the Screening Tool, and the associated reports generated and attached to the original Application for EA, which was submitted to the DFFE with the Draft Scoping Report in September 2023. Updated Screening Tool Reports have also been generated in 2025 at the EIA Report stage. In addition, the findings of the Screening Tool Reports are discussed in the Specialist Assessments included in Appendix G of this EIA Report, as well as Chapters 3 and 4 of this EIA Report. The Screening Tool Reports are also included in Appendix I of this report.

4.2.1.4 GN 320 (published 20 March 2020)

GN 320 prescribes the general requirements for undertaking Site Sensitivity Verifications (SSVs) 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 protocols were enforced within a period of 50 days of publication of the notice i.e., on 9 May 2020.

The Specialist Assessments undertaken as part of this Scoping and EIA Process have complied with GN 320, where applicable, specifically Agriculture, Avifauna, Terrestrial Biodiversity, Aquatic Biodiversity, and Noise. Some of the remaining specialist assessments will comply with Appendix 6 of the 2014 NEMA EIA Regulations (as amended), and where relevant, Part A of GN 320 which contains SSV requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed. This specifically applies to the Visual; Heritage (Archaeology and Cultural Heritage); Palaeontology; Socio-Economic; Traffic; Bats; and Geotechnical Assessments. However, in some instances there are no themes on the Screening Tool that relate to some of these studies and as such sensitivities cannot be verified against the Screening Tool. More information in this regard is included in the Specialist Studies in Appendix G of this EIA Report, which also address the aspect of SSVs, where relevant and applicable.

The Avifauna Impact Assessment also complies with relevant Birdlife South Africa Guidelines.

Some of the specialist assessments comply with the Assessment Protocols published in GN 1150 on 30 October 2020, specifically Terrestrial Biodiversity and Species (as described below).

The Battery Energy Storage System (BESS) High Level Safety, Health and Environment Risk Assessment (included in Appendix G.10 of this EIA Report) serves as a technical report, and the aforementioned legislation is thus not be applicable.

The SSVs for Civil Aviation and Defence will also comply with GN 320. Additional detail on Civil Aviation and Defence is respectively included in Appendix G.14 and Appendix G.15 of this EIA Report.

4.2.1.5 GN 1150 (published on 30 October 2020)

GN 1150 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 1150 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 GG, in which case Appendix 6 of the 2014 NEMA EIA Regulations (as amended) will apply to such applications. This exception does not apply to the proposed project, as the specialist assessments and compliance statements were commissioned after the date of publication of GN 1150 dated 30 October 2020.

The Terrestrial Biodiversity and Species Assessment that has been undertaken as part of this Scoping and EIA Process was commissioned following the publication date of the Species Protocols. Therefore, the Terrestrial Animal and Plant Species components have been undertaken in compliance with GN 1150. One combined report has been compiled for Terrestrial Biodiversity, Terrestrial Animal Species and Terrestrial Plant Species. The Specialist Assessment, including the findings of the SSV, for Terrestrial Biodiversity, Terrestrial Plant Species and Terrestrial Animal Species Assessment is included in Appendix G.2 of this EIA Report. It must be re-iterated that the Terrestrial Plant and Animal Species studies have complied with GN 1150 (dated 30 October 2020). Additional detail is provided in the specialist report.

The Bat specialist did not find any bat Species of Conservation Concern (SCC) on site, hence GN 1150 is not applicable, and the Bat Assessment has been undertaken in compliance with Part A of GN 320.

GN 1150 was amended in July 2023, in GN 3717, to remove reference to the term “terrestrial” from the protocol to ensure that it applies to all plant and animal species, including both aquatic and terrestrial species; and to capture other amendments regarding Compliance Statements. The new Terrestrial Biodiversity and Animal and Plant Species Assessment was commissioned in May 2025 and completed site work in May 2025, after GN 3717 was gazetted in July 2023. Therefore, GN 3717 does apply to these specific studies (i.e. Terrestrial Plant and Animal Species).

However, the Aquatic Biodiversity specialist was appointed in 2021, prior to the promulgation of the amendment in GN 3717. Therefore, the amendment is not applicable to the proposed project. The Aquatic Biodiversity specialist assessment has been undertaken in compliance with GN 320. Nevertheless, the Aquatic specialist considered the GN 3717 amendments, however no aquatic SCC were found during the SSV therefore GN 3717 is not applicable to the Aquatic Biodiversity

and Species Assessment. The Specialist Assessment, including the findings of the SSV, for Aquatic Biodiversity and Species is included in Appendix G.3 of this EIA Report. One combined report has been compiled for Aquatic Biodiversity and Species.

4.2.1.6 Gazetted Renewable Energy Development Zones (REDZs) and Strategic Transmission Corridors

The proposed project is not located within any of the 11 Renewable Energy Development Zones (REDZs) gazetted in GN 114 on 16 February 2018 and GN 144 on 26 February 2021. The proposed project is also not located within the Strategic Transmission Corridors that were gazetted in GN 113 on 16 February 2018 (as amended) or the expanded Strategic Transmission Corridors that were gazetted in GN 1637 on 24 December 2021. Therefore, a full Scoping and EIA Process is being undertaken for the proposed project.

The proposed project is located approximately 16 km north of the Central Strategic Transmission Corridor and approximately 8 km north of the Beaufort West REDZ. The corridors and REDZs respectively facilitate large scale transmission and distribution EGI development (which would be needed to support the proposed project), and large scale wind and solar PV development. Despite the project being located outside these areas, the project itself is still in line with the planning for the area and will benefit from the proximity to the REDZ and corridor.

4.2.1.7 National Environmental Management: Biodiversity Act (Act 10 of 2004)

The National Environmental Management: Biodiversity Act (Act 10 of 2004, as amended) (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.

Overall, the NEMBA focuses on the protection of national biodiversity through the regulation of activities that may affect biodiversity including habitat disturbance, culture of and trade in organisms, both exotic and indigenous. Lists of threatened ecosystems (Sections 52 (1) (a)), threatened and protected species (Sections 56 (1)), and alien invasive organisms (Section 97 (1)) have been published and maintained in terms of NEMBA.

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.

4.2.1.7.1 Threatened Ecosystems

GG 34809, GN 1002, published on 9 December 2011 in terms of Section 52 (1) (a) of the NEMBA, provides a list of threatened terrestrial ecosystems categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) and Protected.

However, a revised national list of ecosystems that are threatened and in need of protection was published in GG 47526, GN 2747 on 18 November 2022 in terms of Section 52 (1) (a) of NEMBA. The revised list includes threatened terrestrial ecosystem types that are classed as CR, EN and VU.

The list of threatened ecosystems includes threatened ecosystems based on vegetation types present within these ecosystems. Should a project fall within a listed vegetation type or ecosystem that is listed, actions in terms of NEMBA are triggered. In addition, Listing Notice 3 (GN R324) of the 2014 NEMA EIA Regulations (as amended) includes Listed Activity 12, for the clearance of an area of 300 m^2 or more of indigenous vegetation in the Western Cape or Northen Cape, specifically within any CR or EN ecosystem listed in terms of Section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as CR in the National Spatial Biodiversity Assessment 2004.

Based on the findings of the Terrestrial Biodiversity and Species Assessment (Appendix G.2 of this EIA Report), the study area is entirely located in the Eastern Upper Karoo (Mucina & Rutherford, 2006[3]) vegetation type, which is listed as **Least Threatened** under the Revised List of Threatened Terrestrial Ecosystems (GG 47526, GN 2747, November 2022). Additionally, field assessments conducted on-site indicate the presence of distinct patches of Upper Karoo Hardeveld, along with extensive areas of riparian vegetation mapped as part of the Bushmanland Vloere vegetation type. Therefore, the above GN and Activity 12 (b) (i) of Listing Notice 3 do not apply to the proposed project.

4.2.1.7.2 Threatened and Protected Species

The 2007 Threatened or Protected Species Regulations of the NEMBA declares species of high conservation value, national importance or that are considered threatened and in need of protection. Furthermore, the regulations provide for the prohibition of specific restricted activities involving specific listed threatened or protected species.

The list of CR, EN, VU or Protected species was published in GG 29657, GN R151 on 23 February 2007 in terms of Section 56 (1) of the NEMBA. The list was further amended in GG 30568, GN R1187 on 14 December 2007, as well as in GG 43386, GN R627 of 3 June 2020. Should a project include threatened and protected species that are listed, actions in terms of NEMBA are triggered.

The faunal species identified in the broader area based on the SSV undertaken by the Terrestrial Biodiversity and Species Specialist are noted in Appendix G.2 of this EIA Report.

[3] Mucina, L. and Rutherford, M.C. (Eds.) (2006). The vegetation of South Africa, Lesotho and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria.

With regards to SCC, sensitive species such as the Riverine Rabbit (Critically Endangered), Karoo Dwarf Tortoise (Endangered), and Southern Mountain Reedbuck (Endangered) are known from the region and has a high probability of occurrence on site. Moreover, other sensitive fauna recorded and confirmed on site include the Northern Tent Tortoise (Near Threatened). Refer to Appendix G.2 of this EIA Report for additional information.

4.2.1.7.3 Alien and Invasive 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.

The Alien and Invasive Species Regulations, published in 2014 and amended in 2020, in terms of the NEMBA provides for the protection of biodiversity through the control and eradication of listed alien and invasive species categorised as follows:

- Category 1a Listed Invasive Species – must be combatted or eradicated;
- Category 1b Listed Invasive Species – must be controlled or 'contained' in accordance with the requirements of an Invasive Species Management Programme;
- Category 2 Listed Invasive Species – require a permit to carry out a restricted activity e.g. cultivation within an area;
- Category 3 Listed Invasive Species – species that are less-transforming invasive species, but introduction, trade or transportation should be limited. Category 3 plant species are automatically Category 1b species where located within riparian and wetland areas;
- Exempted Alien Species – species that are not regulated; and
- Prohibited Alien Species – species for which a permit for restricted activities (e.g., *inter alia* hunting, gathering, breeding, cultivating, trading, transporting) may not be issued.

The Alien and Invasive Species List was published in terms of sections 66(1), 67(1), 70(1)(a), 71(3) and 71A of the NEMBA in GG 40166, GN 864 on 29 July 2016.

In terms of alien invasives, the Terrestrial Biodiversity specialist has noted the presence of *Prosopis* species, *Opuntia* species, and Agave in the study area.

4.2.1.8 The National Heritage Resources Act (Act 25 of 1999)

The National Heritage Resources Act, 1999 (Act No. 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:

a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite; and
c) 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 (e.g. Heritage Western Cape (HWC)):

a) 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;
b) 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
c) 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 m^2 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 m^2 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.

A Heritage Impact Assessment (HIA) (including Archaeology and Cultural Heritage) has been completed during the EIA Phase in accordance with GN 320 (Part A) and Appendix 6 of the 2014 NEMA EIA Regulations (as amended), as well as the relevant heritage guidelines and NHRA. This specialist study and SSV are included in Appendix G.6 of this EIA Report. Refer to Chapter 3 of this EIA Report for additional information regarding heritage.

In terms of Palaeontology, a Palaeontology Impact Assessment has been completed during the EIA Phase in accordance with GN 320 (Part A) and Appendix 6 of the 2014 NEMA EIA Regulations (as amended). This specialist study and SSV are included in Appendix G.7 of this EIA Report. Refer to Chapter 3 of this EIA Report for additional information regarding palaeontology.

SAHRA and HWC are required to provide comment on the proposed project. Since part of the project footprint occurs in the Northern Cape and the majority of the project footprint occurs in the Western Cape, SAHRA and HWC will respectively comment on the relevant sections of the proposed project that fall within the Northern Cape and Western Cape. A Notice of Intent to Develop (NID) was submitted to HWC during the Scoping Phase in mid-October 2023. The NID is included in Appendix I of this EIA Report. HWC provided comment on the NID on 1 November 2023 stating that a full HIA, which makes reference to the Palaeontological Impact Assessment, Archaeological Impact Assessment and the Visual Impact Assessment must be undertaken in terms of Section 38(3) of the NHRA. The HWC Reference Number that was assigned to the proposed Eland WEF during the Scoping Phase was **HWC23101714SB1018**.

Issues / comments raised by the HWC during the 30-day review of the Draft Scoping Report are included in Appendix E Part 1 of this EIA Report. Copies of the comments received from HWC during the 30-day review period are captured and responded to as part of the Scoping Phase Issues and Responses Trail in Appendix E Part 2 of the EIA Report.

The HIA and Palaeontology Impact Assessment are currently being released for a 30-day comment period with this Draft EIA Report. Comments received from SAHRA and HWC on the HIA and Palaeontology Impact Assessment during the EIA Phase will be included as an appendix to the Final EIA Report, and they will also be captured and responded to in the EIA Phase Comments and Responses Report.

Furthermore, once a final comment has been issued by HWC and SAHRA, the recommendations will be included, as relevant, in the Environmental Management Programmes (EMPrs) and list of potential conditions of the EA (should such authorisation be granted). This will essentially give ‘permission’ from the heritage authority to proceed.

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 contact HWC and SAHRA in order to confirm requirements to conduct the work. The permit application must be carried out well in advance of construction to ensure that there is enough time for the authorities 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. 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 SAHRA (2013).

4.2.1.9 National Forests Act (Act 84 of 1998)

The National Forests Act (Act 84 of 1998, as amended) (NFA) allows for the protection of certain tree species. The Minister has the power to declare a particular tree to be a protected tree. The most recent list of protected tree species was published in March 2024 in GN 4496. In terms of Section 15(1) of the NFA, no person may cut, disturb, damage or destroy any protected tree; or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated. The DFFE 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 DFFE.

Where the proposed project impacts on any of the protected species, a permit for the removal will be required during the pre-construction phase, should EA be granted.

As per the 2023 and 2025 Screening Tool Reports, no plant SCC were flagged. However, the high-level desktop assessment indicated at least six plant SCC that occur in the larger area and could potentially occur on site. The Terrestrial and Biodiversity Specialist confirmed that some of these species are very cryptic, and it is possible that given the large extent of the site, that some of these species may have been overlooked. No protected trees were found on site in terms of the NFA. Refer to the Terrestrial Biodiversity and Species Assessment included in Appendix G.2 of this EIA Report for additional information.

In addition, protection of natural forests through gazetted lists of Natural Forests in terms of Sections 7 (2) of the NFA must also be highlighted. In terms of section 7(1) of the NFA, no person may cut, disturb, damage or destroy any indigenous tree in, or remove or receive any such tree from a natural forest except in terms of (a) a license issued under subsection (4) or section 23 of the NFA; or (b) an exemption from the provisions of subsection (4) of the NFA published by the Minister in the Gazette.

4.2.1.10 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.

Invasive alien species likely to occur on site are discussed in the Terrestrial Biodiversity and Species Assessment (Appendix G.2 of this EIA Report). These alien plant species will be managed in line with the EMPrs, which are included in Appendix H of this EIA Report.

As noted in the Agriculture Compliance Statement (Appendix G.1 of this EIA Report), rehabilitation after disturbance to agricultural land is managed by the CARA. A consent in terms of CARA is required for the cultivation of virgin land. Cultivation is defined in CARA as "any act by means of which the topsoil is disturbed mechanically". The purpose of this consent for the cultivation of virgin land is to ensure that only land that is suitable as arable land is cultivated. Therefore, despite the above definition of cultivation, disturbance to the topsoil that results from the construction of infrastructure does not constitute cultivation as it is understood in CARA. This has been corroborated by the National Department of Agriculture, Land Reform and Rural Development (DALRRD[4]). The construction and operation of the proposed project will therefore not require consent from the DALRRD in terms of this provision of CARA. Refer to the Agriculture Compliance Statement included in Appendix G.1 of this EIA Report for additional information in this regard.

4.2.1.11 Subdivision of Agricultural Land Act (Act 70 of 1970)

As noted in the Agriculture Compliance Statement (Appendix G.1 of this EIA Report), two approvals from the DALRRD are required if a proposed development is located on agriculturally zoned land.

The first approval is a No Objection Letter for the change in land use. This letter is one of the requirements for receiving municipal rezoning. This application requires a motivation backed by good evidence that the proposed development is acceptable in terms of its impact on the agricultural production potential of the development site, and the Agricultural Compliance Statement will serve that purpose in this regard. Such an application will be submitted by the Applicant for the proposed project.

The second required approval is a consent for long-term lease in terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA). If the DALRRD approval for the proposed project has already been obtained in the form of the No Objection Letter, then SALA approval is likely to be readily forthcoming. Note that SALA approval is not required if the lease is over the entire farm portion. In the case of the proposed project, only portions of the farm portion would be leased.

[4] Following the announcement of the National Executive of the 7th Administration, the Ministry of Agriculture has been separated from the Ministry of Land Reform and Rural Development. For purposes of this EIA Report, the term DALRRD has been retained for simplicity.

SALA approval can only be applied for once the Municipal Rezoning Certificate and EA are in hand. This is being dealt with by the Project Developer (outside of the EIA Process).

The Agriculture Compliance Statement (Appendix G.1 of this EIA Report) also notes that power lines require the registration of a servitude for each farm portion crossed. In terms of the SALA, the registration of a power line servitude requires written consent of the Minister of the DALRRD unless either of the following two conditions apply: 1) if the servitude width does not exceed 15 metres; and 2) if Eskom is the applicant for the servitude. The compliance statement further states that if one or both conditions apply, then no agricultural consent is required. The second condition is likely to apply, even if another Applicant obtains EA for and constructs the power line, but then hands the power line over to Eskom for its operation. Eskom is currently exempt from agricultural consent for power line servitudes. In the case of the proposed project, the power line servitude is estimated to be 55 m wide, hence the first condition does not apply; and with regards to the second condition, if the power line is handed over to Eskom at a later stage, then the agricultural consent is not required, however, if the Applicant intends to maintain and operate the power line under the name of the Applicant, then agricultural consent will be required. This will be dealt with by the Applicant separately from the EA process.

Refer to the Agriculture Compliance Statement included in Appendix G.1 of this EIA Report for additional information in this regard.

4.2.1.12 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 (GA), 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 the outer edge of the 1 in 100 year flood line and /or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam; within a watercourse; 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. An application for water use authorisation for the proposed project may be required should any of the planned structures or infrastructure associated with the proposed project trigger water uses in terms of Section 21 (c) and Section 21 (i) of the NWA.

The GA for Section 21 (c) and (i) water uses as defined under the NWA were revised in 2016 (GN R509) and further revised in December 2023 (GN R4167). Determining if a Water Use Authorisation is required for these water uses is associated with the risk of degrading the ecological status of a watercourse. A low risk of impact could be authorised in terms of a GA.

According to the Aquatic Biodiversity Assessment (Appendix G.3 of this EIA Report), the Risk Assessment that was undertaken determined that the proposed project poses a LOW risk of impacting aquatic habitat, water flow and water quality. With the findings of the Risk Assessment, the water use activities associated with the proposed project could potentially be authorised through a general authorisation for Section 21(c) and (i) water uses.

The NWA also provides for measures to prevent, control and remedy the pollution of surface and groundwater sources. The property on which the proposed project is located falls within the D55A quaternary catchment. This proposed project falls under the quaternary catchment of the Lower Orange Water Management Area (WMA) which is within the jurisdiction of the DWS. The groundwater General Authorisation (GA) for this catchment is 45 m^3/ha/a (published on 2 September 2016, in GG 40243, GN 538 (i.e. Revision of GA for the taking and storing of water)). This means that in this catchment, 45 m^3 of water can be abstracted per year for every hectare, under the GA. For example, a 100 ha property could be abstracting a maximum of 4 500 (45 x 100) m^3/a under the GA. However, the GA volume is capped at 40 000 m^3/a (1.27 L/s) per property. Therefore, a property with an extent of 20 000 ha would only be allowed to abstract 40 000 m^3/a under the GA. If larger volumes are needed, a Water Use Licence will have to be applied for. If groundwater will be used for the proposed projects, and if more than this is required for the proposed projects, or to source all the water from a single property, then an integrated Water Use Licence Application would be required to meet the demands of the construction, operational and decommissioning periods. This will be undertaken post EA.

Should groundwater be used as a water source for the proposed projects, then it is planned to be transported from the boreholes to the site via trucks or water pipelines. A separate Environmental

Assessment Process will be undertaken should the water supply method trigger listed activities in terms of the 2014 NEMA EIA Regulations (as amended). In addition, groundwater may also need to be stored on site in suitable containers or reservoir tanks during the construction, operational and decommissioning phases. Such storage may trigger the need for a Water Use Authorisation. According to the Revision of GA for the taking of and storing of water published in terms of the NWA, a total of 2000 m^3/a can be stored on each property in an open container under the regional GA as long as it is not in a water course. If this is exceeded, then a Water Use Licence would be needed. Therefore, for the proposed project, it is proposed that a total of 2000 m^3/a will be stored at the facility on the affected property in an open container.

In addition, the disposal of sewage from the developed site is likely to be stored in conservancy tanks for removal and treatment at the nearby wastewater treatment works of the local authority. This low volume would be within the GA for Section 21 (g) water use activities.

In terms of GAs or Water Use Licences needed for the proposed projects, these will be undertaken post EA (should such authorisation be granted), as there are various factors to consider, such as confirmation of the selected water source in terms of the various options available; and that the proposed projects still need to be subjected to the competitive Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar process. Note that precedent has been set in the sense that EAs for renewable energy, BESS and EGI projects have been granted positively and are not contingent on the application for Water Use Licence or GA. Nevertheless, the relevant applications will be made by the Applicant, post EA once relevant investigations have been completed. Comment regarding this approach will be sought from the DWS during the 30-day comment period on the EIA Report.

During the Scoping Phase, follow up emails were sent to the DWS and BOCMA on various occasions, including personalised reminder emails, in order to seek comments during the 30-day comment period for the Draft Scoping Reports. Refer to Appendix E Part 1 of this EIA Report for the proof of follow up correspondence sent during the Scoping Phase. Comments were received from the DWS and BOCMA, as captured in Appendix E Part 1 of this EIA Report and responded to in the Scoping Phase Issues and Responses Trail in Appendix E Part 2 of this EIA Report.

4.2.1.13 Water Services Act (Act 108 of 1997)

Water will be required during the construction, operational and decommissioning phases of the proposed project. Potable water is only to be utilised for human consumption purposes, whereas greywater is to be used for earthworks, dust suppression, etc. Water will be sourced from the following potential sources: Beaufort West Local Municipality; third-party water supplier; existing boreholes; newly drilled boreholes on site; or a combination of existing and newly drilled boreholes on site. Should the latter three be selected for water use, the boreholes will be subjected to complete geohydrological testing and an assessment, as well as a Water Use Licence Application or General Authorisation process. This will be undertaken as a separate process, once more detailed information becomes available, outside of the current EA Application for the proposed project. Compliance with the Water Services Act (Act 108 of 1997) will be undertaken during the relevant phase of the proposed project, in consultation with the local and district municipalities.

4.2.1.14 Hazardous Substances Act (Act 15 of 1973)

During the proposed project, fuel and diesel will be utilised to power vehicles, generators and equipment. In addition, potential spills of hazardous materials could occur during the relevant

phases. Such management actions have been recommended in the EMPr, which is included in Appendix H of the EIA Report.

4.2.1.15 National Environmental Management: Waste Act (Act 59 of 2008, as amended) (NEM:WA)

The National Environmental Management: Waste Act (Act 59 of 2008, as amended) (NEM:WA) was published with one of the main objectives to reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. Section 19 of the NEM:WA allows the Minister to publish a List of Waste Management Activities that have, or are likely to have, a detrimental effect on the environment published. Such a list specifies the waste management activities that will require a Waste Management Licence.

The List of Waste Management Activities was originally published in GN 921 on 29 November 2013, and thereafter amended in GN 332 on 2 May 2014; GN 633 on 24 July 2015; GN 1094 on 11 October 2017; and GN 1757 on 11 February 2022. The List of Waste Management Activities include Categories A, B and C. If any waste management activities listed in Category A are triggered by a development, a BA process must be undertaken in terms of the 2014 NEMA EIA Regulations (as amended), as part of the Waste Management Licence application. Waste management activities in Category B will, however, require a full Scoping and EIA Process in terms of the 2014 NEMA EIA Regulations (as amended), as part of the Waste Management Licence application. If any of the waste management activities in Category C are triggered, then the relevant Norms and Standards must be followed.

Based on a review of the project description, the proposed project will **not** trigger the need for a Waste Management Licence. However, 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 is included in Appendix H of the EIA Report.

4.2.1.16 National Environmental Management: Air Quality Act (Act 39 of 2004)

The National Environmental Management: Air Quality Act (Act 39 of 2004, as amended) (NEM: AQA) was published in 2004 and came into full effect on 31 March 2010, when the Atmospheric Pollution Prevention Act (Act 45 of 1965) (APPA) was repealed. The NEM: AQA was published with the overall objective to:

- "*reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development;*
- *provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto*".

The list of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage was published under GN 248, GG 33064 dated 31 March 2010 and thereafter amended in GN 893, GG 37054 dated 22 November 2013. The list of activities

was further amended in GN 551, GG 38863 dated 12 June 2015; GN 1207, GG 42013 dated 31 October 2018; GN 687, GG 42472 dated 22 May 2019; and GN 421, GG 43174 dated 27 March 2020.
Section 22 of the NEM: AQA deals with the consequences of listing, and it states that "no person may without a provisional atmospheric emission licence or an atmospheric emission licence conduct an activity (a) listed on the national list anywhere in the Republic; or (b) listed on the list applicable in a province anywhere in that province". Therefore, a Provisional Atmospheric Emissions Licence (AEL) and/or AEL is required for any plant or proposed development that triggers a listed activity.

Based on a review of the project description, the proposed project will **not** trigger the need for an AEL. However, the proposed stockpiling activities, including earthworks, may result in the unsettling of, and temporary exposure to, dust. Appropriate dust control methods will need to be applied. Such management actions are recommended in the EMPr, which is included as Appendix H of the EIA Report.

4.2.1.17 National Environmental Management: Protected Areas Act (NEM: PAA) (Act 57 of 2003) and National Protected Area Expansion Strategy (NPAES) Focus Areas

According to the South African Protected Areas Database (SAPAD), the project area is not located within any formally Protected Areas, as declared under the National Environmental Management: Protected Areas Act (Act 57 of 2003) (NEM: PAA). The Karoo National Park lies towards the south, more than 30 km away from the proposed Eland WEF.

A minor section (along the western edge) of the study area falls within the National Protected Area Expansion Strategy (NPAES) Focus Area, as well as one proposed turbine and part of the internal road network. The NPAES focus areas for land-based expansion are comprised of large, intact and unfragmented areas of importance for biodiversity representation and ecological persistence. As such, these areas are suitable for the creation or expansion of extensive Protected Areas. As noted in the Terrestrial Biodiversity and Species Assessment (Appendix G.2 of the EIA Report), only Turbine 5 of the proposed Eland WEF intersects with the NPAES, which is minor within the larger landscape. The Terrestrial Biodiversity Specialist notes that a single turbine position will not have a significant impact on the NPAES.

Figure 4.1 below illustrates the proposed Eland WEF and Windy Plains WEF (the latter is the subject of a separate EIA Report) in relation to the NPAES focus areas and the Karoo National Park.

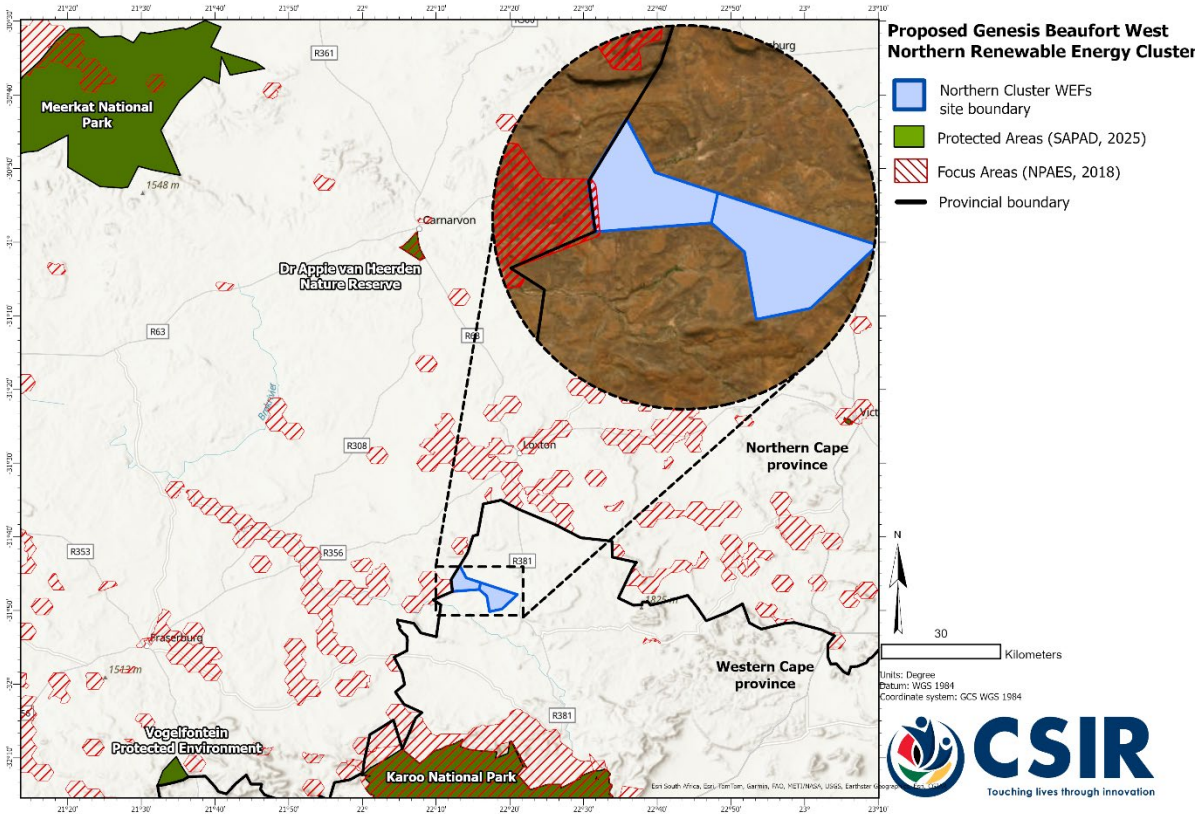


Figure 4.1: The Proposed Eland WEF and Windy Plains WEF (subject of a separate EIA Report) in relation the Karoo National Park and the NPAES Focus Area.

4.2.1.18 Astronomy Geographic Advantage (Act 21 of 2007)

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 Strategic Environmental Assessment (SEA) (Department of Environment, Forestry and Fisheries (DEFF), 2019: Part 3, Page 2[5]), the majority of the mid-frequency dish array of the Square Kilometre Array (SKA) will be constructed in the core which is in 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

[5] Department of Environment, Forestry and Fisheries (DEFF), 2019. Phase 2 Strategic Environmental Assessment for wind and solar PV energy in South Africa. CSIR Report Number: CSIR/SPLA/SECO/ER/2019/0085 Stellenbosch, Western Cape.

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) (DEFF, 2019[2]: 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 (DEFF, 2019[2]: Part 3, Page 2).

Table 4.1 indicates the SKA sensitivity distance guidelines based on the Phase 2 Wind and Solar SEA. The location of the proposed project does not pose an EMI or RFI risk to the SKA. Refer to Figure 4.2 for the location of the proposed project in relation to the SKA and KCAAA. The proposed project site is located approximately 150 km away from the SKA core, in an area of low sensitivity in terms of SKA sensitivity for the development of wind energy based on the guidelines noted in the Phase 2 Wind and Solar SEA (Table 4.1).

Table 4.1: 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

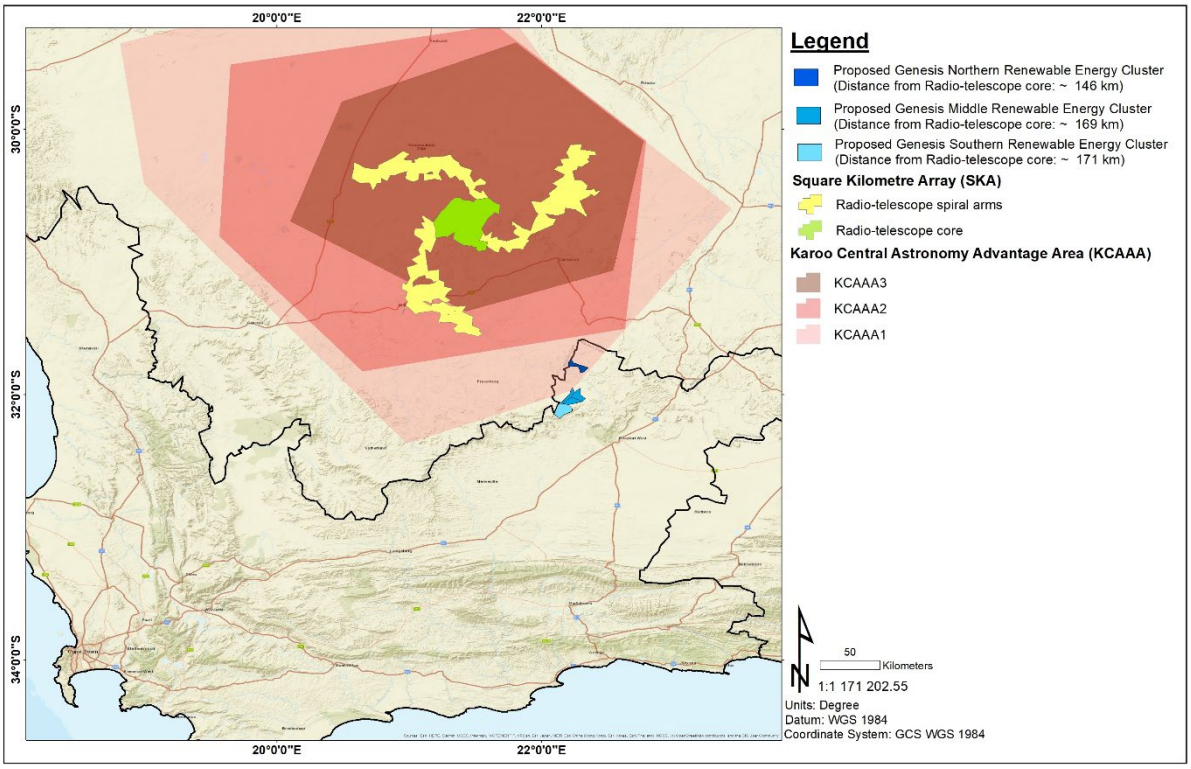


Figure 4.2: Location of the proposed Genesis Northern, Middle and Southern Clusters in relation to the SKA and KCAAA. The proposed WEF is located in the Northern Cluster.

The Screening Tool Report (Appendix I of this EIA Report) notes that the study area is very high sensitivity due to it being inside or within 18 km of the Radio Astronomy Advantage Area (i.e. KCAAA 1).

The South African Radio Astronomy Observatory (SARAO) is registered on the project I&AP database as a key stakeholder and was invited to comment on the project during the pre-application phase. During the Scoping Phase, SARAO responded with their findings of an assessment of the potential impact of the proposed project on the SKA radio telescopes. SARAO found that the project represents a low risk of interference to the nearest SKA radio telescope with a compliance surplus of 28.42 dBm/Hz. Accordingly, they had no objection to the proposed project. Therefore, RFI and EMI specialist studies are not required and have not been commissioned as SARAO's assessment and findings are considered conclusive in respect of the RFI sensitivity theme. Copies of the comments received from SARAO are included in Appendix E Part 1 of this EIA Report.

4.2.1.19 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.

4.2.1.20 Other Applicable Legislation

Other applicable national legislation that may apply to the proposed project include:

- Advertising on Roads and Ribbons Act (Act 21 of 1940);
- Electricity Act (Act 41 of 1987), as amended;
- Electricity Regulations Amendments (August 2009);
- Promotion of Administrative Justice Act (Act 2 of 2000);
- Civil Aviation Act (Act 13 of 2009) and Civil Aviation Regulations (CAR) of 1997;
- Civil Aviation Authority Act (Act 40 of 1998);
- White Paper on Renewable Energy (2003);
- Integrated Resource Plan for South Africa (2019);
- Occupational Health and Safety Act (Act 85 of 1993), as amended by Occupational Health and Safety Amendment (Act 181 of 1993)[6];
- Road Safety Act (Act 93 of 1996);
- Fencing Act (Act 31 of 1963);
- National Biodiversity Offset Guideline (GN 3569 of 23 June 2023); and
- National Road Traffic Act (Act 93 of 1996).

4.2.2 Provincial Legislation

4.2.2.1 Western Cape Nature 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 EA 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. With regards to protected plants, the ordinance includes a list of endangered flora (Schedule 3) and protected flora (Schedule 4). Permits will be required from CapeNature under the Ordinance, should the final development footprint of the proposed project necessitate the removal or relocation of protected or endangered plant species.

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.

[6] The proposed Battery Energy Storage Systems (BESS) must be designed, operated, maintained and decommissioned according to the requirements of Occupational Health and Safety Act (Act 85 of 1993).

According to the Aquatic Biodiversity and Species Assessment (Appendix G.3 of this EIA Report), no SCC are known to occur in the study area from an aquatic perspective. However, based on the Terrestrial Biodiversity and Species Assessment (Appendix G.2 of this EIA Report), in terms of fauna, there are several listed mammals which occur in the area, and which would potentially be impacted by the development. This includes sensitive species, such as the Riverine Rabbit (Critically Endangered), Karoo Dwarf Tortoise (Endangered), and Southern Mountain Reedbuck (Endangered). Other sensitive fauna recorded and confirmed on site include the Northern Tent Tortoise (Near Threatened). Plant surveys found no threatened species within the development footprint.

Refer to the Terrestrial Biodiversity and Species Assessment (Appendix G.2 of this EIA Report) and Chapter 3 of this EIA Report for additional information regarding the terrestrial animal and plant species found in the study area.

4.2.2.2 Draft Western Cape Biodiversity Bill (May 2019) and Western Cape Biodiversity Act (Act 6 of 2021)

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.

4.2.2.3 Western Cape Land Use Planning Act (Act 3 of 2014)

The purpose of the Western Cape Land Use Planning Act (Act 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 (SDFs); to provide for minimum standards for, and the efficient coordination of, SDFs; 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. This legislation will be taken into consideration by the Applicant during the planning and design phase.

4.2.2.4 Western Cape Provincial Spatial Development Framework (2014)

Promoting renewable energy is one the key factors in the 2014 Western Cape Provincial SDF (Department of Environmental Affairs and Development Planning (DEA&DP), 2014[7]). Some of the provincial policies in the Western Cape Provincial SDF are supporting emergent IPPs and sustainable energy producers in suitable rural locations; and encouraging and supporting renewable energy generation at scale (DEA&DP, 2014; Page 52). Decreasing unemployment and increasing employment opportunities are additional key factors noted in the Provincial SDF. The

[7] Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) (2014). Western Cape Provincial Spatial Development Framework. Available: https://cer.org.za/wp-content/uploads/2015/07/Western-Cape-Provincial-SDF-2014.pdf. Accessed: August 2025.

proposed project will promote renewable energy through the development of a WEF, which will also result in construction and operational phase employment opportunities.

4.2.2.5 Northern Cape Nature Conservation Act (Act 9 of 2009)

The Northern Cape Nature Conservation Act (Act 9 of 2009) (NCNCA) has reference to the proposed project. This Act aims at improving the sustainability in terms of balancing natural resource usage and protection or conservation thereof. It includes six schedules, as follows:

- Schedule 1 - Specially Protected species;
- Schedule 2 - Protected species;
- Schedule 3 - Common indigenous species;
- Schedule 4 - Damage causing animal species;
- Schedule 5 - Pet species; and
- Schedule 6 - Invasive Species.

With regards to protected flora, the NCNCA includes a list of protected flora.

Based on the Terrestrial Biodiversity and Species Assessment conducted for the proposed project, no SCC were recorded on site; however, based on existing reports from surrounding WEFs, there is a reasonable probability that a moderate proportion of SCC could be present in the regional area. There are several provincially protected species listed in the Northern Cape province. The implication is that a comprehensive list of species occurring within the footprint of the proposed infrastructure is required and a permit application submitted for any of those listed as protected. A walk-through survey prior to the commencement of construction activities is therefore required for the approved layout in order to identify the relevant species and abundance of each species for which permits are required from the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARDLR), for their relocation or destruction, as required.

Refer to the Terrestrial Biodiversity and Species Assessment for additional information.

It has been recommended as part of the EMPr, that permits should be submitted and obtained for either the relocation or destruction of provincially protected species, where the approved layout designs impact on provincially protected individuals.

The Northern Cape DAEARDLR, serving as the provincial authority for issuing of the relevant permits, is included on the project database (as shown in Appendix D of this EIA Report).

4.2.2.6 Northern Cape Strategic Plan 2020-2025

The vision of the Strategic Plan is a modern, growing, and successful Northern Cape. In addition, the main aim of the Plan is to govern the Northern Cape Province towards alleviating the triple challenges (e.g., unemployment, inequality, and poverty) and towards a people centred Public Service.

The Northern Cape Strategic Plan 2020 stated that the province is one of the best sites in the world to produce renewable energy (especially solar PV) and that this potential has attracted a large number of investors to the province. However, the Plan also stated that the province also experiences inequality, unemployment, and poverty.

The proposed project aligns itself with the aim of this Strategic Plan in that it will provide employment opportunities as well as a required source of energy to the national grid. Employment creation would mainly be temporary in nature during the construction phase with limited opportunities created during the operational phase. Refer to Chapter 2 of this EIA Report for additional information on the proposed employment opportunities.

4.2.2.7 Northern Cape Provincial Spatial Development Framework (2018)

The focus areas in the 2018 Northern Cape Provincial SDF include urban and rural development; enhancing regional connectivity; promoting infrastructure investment; and protecting local resources. In addition, the SDF stresses the need to address spatial inefficiencies and inequalities, identify areas of opportunity and ensure proactive management of natural resources and ecosystems in the Northern Cape. The SDF also outlines that sustainability is central to provincial economic policies, as well as to its social development agenda.

The 2012 Northern Cape SDF[8] lists a number of sectoral strategies and plans that *inter alia* promote the development of renewable energy supply schemes that are strategically important for increasing the diversity of domestic energy supplies and avoiding energy imports while minimizing detrimental environmental impacts. It also promotes to develop and institute innovative new energy technologies to improve access to reliable, sustainable, and affordable energy services with the objective to realize sustainable economic growth and development. The goals of securing supply, providing energy services, tackling climate change, avoiding air pollution, and reaching sustainable development in the province offer both opportunities and synergies which require joint planning between local and provincial government as well as the private sector.

The proposed project is in line with the focus areas of the Northern Cape SDF. It will uplift the local communities through employment creation and increased investment in infrastructure. In addition, the proposed development will provide a sustainable source of energy for the national grid.

4.2.3 District and Local Planning Legislation

4.2.3.1 Environmental Management Framework

Research indicates that there is no gazetted Environmental Management Framework (EMF) for the Beaufort West Local Municipality and Central Karoo District Municipality (CKDM) (Western Cape); and Pixley ka Seme District Municipality (Northern Cape). The Screening Tool also notes that no intersections with gazetted EMF areas have been found for the project area. The Screening Tool also did not identify an EMF for the Namakwa District Municipality (Northern Cape). In addition, the CSIR confirmed with the Western Cape DEA&DP that there are no adopted EMFs for the Beaufort West Local Municipality or the CKDM.

An EMF and Strategic Environmental Management Plan for the Namakwa District Municipality was compiled by Nemai Consulting in March 2011. It is unclear if this has been gazetted, and no corresponding information was found on the municipal website. However, the CSIR clarified this with the Northern Cape DAEARDLR, who confirmed that all the district municipalities in the Northern Cape have adopted EMFs. The Northern Cape DAEARDLR further noted that these adopted EMFs are very old (pre-2011); and that it is recommended to use the 2024 Northern Cape

[8] Northern Cape Provincial Government (2012). Northern Cape Provincial Development and Resource Management Plan / Provincial Spatial Development Framework Report.

Biodiversity Spatial Plan (NC BSP) as reference for development applications. The Department further noted that the 2024 NC BSP will differ from the 2011 Namakwa District Municipality EMF, based on more updated and refined information. The 2011 EMF document states that the vision for the Namakwa District Municipality from an environmental perspective is to "*ensure that economic and social development in the municipality advances to meet inhabitants' needs whilst ensuring that environmental goods and services are protected where stressed and used where sustainable*" (Nemai Consulting, 2011, Page 149-150[9]). One of the principles identified to achieve this vision is the efficient use of renewable resources to protect natural systems. Some of the strategic issues or focus areas is encouraging developers to investigate and develop wind energy projects due to the high wind resources in the district (Nemai Consulting, 2011). Therefore, the relevant Listed Activities in the Listing Notices of the 2014 NEMA EIA Regulations (as amended) have been included in relation to the Namakwa District Municipality EMF. An EMF for the Pixley ka Seme District Municipality (Northern Cape) could not be found online.

4.2.3.2 Beaufort West Local Municipality Integrated Development Plan (IDP) (2022-2027)

The Beaufort West Local Municipality Integrated Development Plan (BWLM IDP) (2022-2027) states that the vision for the municipality is to be the economic gateway to the Western Cape, where people are developed and live in harmony together (BWLM, 2025, Page 11[10]).

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;
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.

The IDP identified renewable energy as a key strategic economic sector (BWLM, 2025).

The Central Karoo region is attractive for renewable energy projects due to the significant solar and wind energy resources. Various renewable energy projects have been approved in the CKDM area, but most have yet to be implemented. The CKDM Strategic Development Framework has identified considerable opportunities for expanding renewable energy projects specifically related to solar and wind power generation in the CKDM, which encourages IPPs to locate in the region and to create downstream business and employment opportunities (CKDM, 2019[11]).

[9] Nemai Consulting (2011). Environmental Management Framework and Strategic Environmental Management Plan: Namakwa District Municipality: Final Report – March 2011. Available: https://www.sanbi.org/wp-content/uploads/2018/04/environmental-management-framework-and-strategic-environmental-management-plan-namakwa-district-muni.pdf Accessed: August 2025.

[10] Beaufort West Local Municipality (2025). Final 2025/2026 IDP Review: 5th Generation Integrated Development Plan [2022/2027 IDP]. Available: https://www.beaufortwestmun.co.za/resource-category/integrated-development-plan?category=451. Accessed August 2025.

[11] Central Karoo District Municipality. (2019). Central Karoo District Municipality Spatial Development Framework.

According to the Western Cape Provincial SDF (DEA&DP, 2014[12]), renewable energy generation is also deemed one of the most promising economic sectors in the Central Karoo region that will add significant value to the regional Gross Domestic Product (GDPR), while having the potential to change the composition and character of towns throughout the municipal district (CKDM, 2017[13]).

4.2.3.3 Karoo Hoogland Local Municipality Integrated Development Plan (IDP) (2022-2027)

The Karoo Hoogland Local Municipality Integrated Development Plan (KHLM IDP) (2022-2027) states that the vision for the municipality is to be an "economic node in the Northern Cape earmarked by community service delivery" (KHLM, 2025, Page 6[14]). Basic service delivery, Local Economic Development, financial viability, municipal transformation and organizational development, good governance and public participation are the five key performance areas identified (KHLM, 2025). One of the Local Economic Development goals for the KHLM is to assist with economic interventions in sector development, such as agricultural, tourism and renewable energy. The proposed project is therefore well aligned with the KHLM IDP, as it is for renewable energy development, which will result in socio-economic benefits for the surrounding regions and it will contribute to the national energy requirements.

4.2.3.4 Ubuntu Local Municipality Integrated Development Plan (IDP) (2024-2025)

The vision for the Ubuntu Local Municipality (ULM), as documented in the municipal IDP (ULM IDP, 2024-2025), is for the municipal council and administration to champion and commit to ensuring a better life for all (ULM, 2025, Page 3[15]). Lack of job creation opportunities, low literacy rate and a lack of entrepreneurship are some of the challenges listed in terms of local economic development in the municipality (KHLM, 2025, Page 92). The proposed project aims to create employment opportunities during the construction phase and operational phase, as noted above. The project will also result in several socio-economic benefits as noted in the Socio-Economic Assessment (Appendix G.8 of this EIA Report).

Overall, the proposed project will create job opportunities and economic spin offs during the construction and operational phases (if EA is granted by the DFFE). Furthermore, the proposed project is aligned with the general objectives of the local municipality IDPs, and provincial and district municipality SDFs in that it will encourage sustainable economic growth through increased investment and employment opportunities.

4.2.3.5 Guidelines, Frameworks and Protocols

The following guidelines, frameworks and protocols are applicable to the proposed project:

- Guidelines published in terms of the NEMA EIA Regulations, in particular:

[12] Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) (2014). The Western Cape Provincial Spatial Development Framework. Accessed: https://cer.org.za/wp-content/uploads/2015/07/Western-Cape-Provincial-SDF-2014.pdf. August 2025.

[13] Central Karoo District Municipality. (2017). Central Karoo District Municipality Integrated Development Plan 2017-2022.

[14] Karoo Hoogland Local Municipality (2025). Final 2025/2026 IDP Review: 5th Generation Integrated Development Plan (IDP) of the Karoo Hoogland Municipality [2022/2027 IDP]. Available: https://www.karoohoogland.gov.za/wp-content/uploads/2025/04/IDP-2022-2027-NC066-To-Council-Draft-31-March-2025.pdf. Accessed August 2025.

[15] Ubuntu Local Municipality (2025). Final 2024/2027 IDP. Available: https://www.ubuntu.gov.za/index.php/documents/category/136-ubuntu-idp-2024-2025. Accessed August 2025.

  - Guideline on Alternatives (DEA, 2014);
  - Guideline on Transitional Arrangements (Western Cape DEA&DP, 2013);
  - Guideline on Alternatives (Western Cape DEA&DP, 2013);
  - Guideline on Public Participation (DEA, 2012; DEA&DP, 2013; DEA, 2017);
  - National Noise Control Regulations (GN R154 of 1992) and SANS 10103:2008;
  - Guideline on Need and Desirability (Western Cape DEA&DP, 2013; DEA, 2017);
- Information Document on Generic Terms of Reference for Environmental Assessment Practitioners (EAPs) and Project Schedules (March 2013);
- Integrated Environmental Management Information Series (Booklets 0 to 23) (Department of Environmental Affairs and Tourism (DEAT), 2002 – 2005);
- Guidelines for Involving Specialists in the EIA Processes Series (DEA&DP; CSIR and Tony Barbour, 2005 – 2007);
- BirdLife South Africa (BLSA) 2015 Guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa;
- Species Environmental Assessment 2020 Guideline: Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for EIAs in South Africa. South African National Biodiversity Institute (SANBI);
- United Nations Framework Convention on Climate Change (1997); and
- Kyoto Protocol (which South Africa acceded to in 2002).

4.2.4 International Finance Corporation Performance Standards

In order to promote responsible environmental stewardship and socially responsible development, the proposed 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 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 the proposed WEF 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 Scoping and EIA Process is being undertaken.

Other Acts, standards and/or guidelines which may also be applicable will be reviewed in more detail as part of the specialist studies to be conducted for the EIA Process.

4.3 Legal Context for this EIA

In terms of the NEMA and the 2014 NEMA EIA Regulations (as amended), a full Scoping and EIA Process is required for the proposed project. As noted above, the proposed project is not located within any of the 11 REDZs gazetted in GN 114 on 16 February 2018 and GN 144 on 26 February 2021. In addition, the proposed projects are not located within any of the Strategic Transmission Corridors that were gazetted in GN 113 on 16 February 2018 and GN 1637 on 24 December 2021. Therefore, a full Scoping and EIA Process is required for the proposed project.

The need for the full Scoping and EIA Process is triggered by, amongst others, the inclusion of Activity 1 listed in GN R325 (Listing Notice 2):

- ***"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facility or infrastructure is for photovoltaic installations and occurs (a) within an urban area; or (b) on existing infrastructure".***

All the listed activities forming part of this proposed development and therefore requiring EA were included in the original Application Form for EA, which was prepared and submitted to the DFFE with the Draft Scoping Report on 4 September 2023. However, during the 30-day review period on the Draft Scoping Report, comments were raised relating to the applicability of listed activities, and additional research was undertaken in terms of the listed activities and respective thresholds. Based on this, the applicability of certain listed activities was updated and as such an Amended Application Form for EA was submitted to the DFFE together with the Final Scoping Report for consideration in October 2023. A summary is provided below describing the main updates that were made to the listed activities at the Final Scoping Report stage:

- Removal of Activity 27 of Listing Notice 1 as the development will require the clearance of more than 20 ha of indigenous vegetation, and therefore only Activity 15 of Listing Notice 2 is applicable.
- Removal of Activity 12 of Listing Notice 3 as per the indication of the Western Cape DEA&DP: Directorate Development Facilitation that no bioregional plans exist for the relevant municipalities in the Western Cape. It is important to note that the Northern Cape DAEARDLR also confirmed that there are no bioregional plans in place for the Northern Cape.

However, based on design progression and the EIA Phase findings, certain listed activities now apply. A summary is presented below:

- Inclusion of Activity 9 of Listing Notice 1 as the development will require construction of stormwater infrastructure.
- Inclusion of relevant Listed Activities that relate to the Northern Cape in Listing Notice 3.

The Northern Cape DAEARDLR and Western Cape DEA&DP were consulted with regarding Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) stipulated in Listing Notice 3. The Northern Cape DAEARDLR explained that the 2016 Northern Cape CBA map has been replaced by the 2024 NC BSP. The Northern Cape DAEARDLR further explained that although the 2024 NC BSP is not yet adopted, it is highly recommended to make use of the 2024 NC BSP,

which is based on the most recent and refined spatial data for the province and replaces all previous biodiversity spatial plans.

Both the Northern Cape DAEARDLR and Western Cape DEA&DP confirmed that no Bioregional Plans are adopted for the affected municipalities; and that ESAs are not mentioned in Listing Notice 3 for the Northern Cape and Western Cape.

The updated listed activities triggered by the proposed project are indicated in Table 4.2.

Table 4.2: Listed Activities in GN R327, GN R325, and GN R324 that will be potentially triggered by the proposed project

Activity No(s):	Relevant Basic Assessment Activities as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Description of the portion of the proposed project to which the applicable listed activity relates.
Activity 9 (i) and (ii)	The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water: (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where: (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	The proposed project will include the development of stormwater infrastructure that will exceed 1 km in length with an internal diameter of more than 0.36 m and a throughput of more than 120 litres/second. The stormwater control measures / infrastructure will be constructed along the proposed internal roads. In addition, permanent roads will be up to 6 m wide and may require side drains on one or both sides. The proposed project will take place outside of an urban area. It will be located on various affected farm portions, northwest of Beaufort West, in the Beaufort West Local Municipality (which falls within the Central Karoo District Municipality) in the Western Cape province; and the Karoo Hoogland Local Municipality and Ubuntu Local Municipality (which respectively fall within the Namakwa District Municipality and Pixley ka Seme District Municipality) in the Northern Cape.
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; excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is — (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development.	The project will entail the construction of a 33/132 kV on-site substation complex and a 132 kV overhead power line to facilitate the connection between the proposed project and internal grid connections to national electrical grid network. The dedicated 132 kV overhead power line will be constructed from the proposed on-site substation at the Eland WEF to the proposed substation located at the Genesis Windy Plains WEF (the latter is subject to a separate Scoping and EIA Process). The on-site substation complex will include the following: • On-site Substation; • Battery Energy Storage System (BESS); • Operation and Maintenance (O&M) Building; and • Laydown area. The on-site substation will have a capacity stepping up from 33 kV to 132 kV. This above constitutes facilities for the distribution and transmission of electricity.

		The proposed project will be located on various affected farm portions, northwest of Beaufort West, in the Beaufort West Local Municipality (which falls within the Central Karoo District Municipality) in the Western Cape province; and the Karoo Hoogland Local Municipality and Ubuntu Local Municipality (which respectively fall within the Namakwa District Municipality and Pixley ka Seme District Municipality) in the Northern Cape. Therefore, the proposed project is situated outside of an urban area.
Activity 12 (ii) [(a) and (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; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding: (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of commencement of the development and where indigenous vegetation will not be cleared.	The proposed project will entail the construction of various infrastructure and structures (such as wind turbines (including foundations and hardstand/laydown), 132 kV overhead power line and its associated infrastructure (such as the service road), on-site substation, BESS, laydown area, internal roads, and various ancillary infrastructure such as inverter/transformer stations, on-site medium voltage cables, internal roads, storm water infrastructure, fencing, Operation and Maintenance (O&M) building / centre, site office, workshop, staff lockers, bathrooms / ablutions, warehouse, and guard house etc.). Where new internal roads cross drainage features, new crossing structures will also be required. These infrastructure and structures will exceed a footprint of 100 m^2 and some occur within small tributaries, watercourses, and wetlands, and within 32 m of these aquatic features, which have been delineated by the aquatic specialist. The proposed project will be located on various affected farm portions, northwest of Beaufort West, in the Beaufort West Local Municipality (which falls within the Central Karoo District Municipality) in the Western Cape province; and the Karoo Hoogland Local Municipality and Ubuntu Local Municipality (which respectively fall within the Namakwa District Municipality and Pixley ka Seme District Municipality) in the Northern Cape. Therefore, the proposed project is situated outside of an urban area.
Activity 14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The proposed renewable energy facility development will require storage and handling of dangerous goods, including fuel, oils, lubricants, solvents, cement and chemical storage on site, that will be greater than 80 m^3 but not exceeding 500 m^3. Therefore, infrastructure for the storage and handling of dangerous goods of 80 m^3 or more but not exceeding 500 m^3 is proposed. Dangerous goods will be stored on site within designated areas such as laydown areas.
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;	The proposed project will entail the excavation, removal and moving of more than 10 m^3 of soil, sand, pebbles or rock from nearby watercourses and small drainage features. The proposed project may also entail the infilling of more than 10 m^3 of material into the nearby aquatic features. The aquatic features

	but excluding where such infilling, depositing, dredging, excavation, removal or moving- a) will occur behind a development setback; b) is for maintenance purposes undertaken in accordance with a maintenance management plan; c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	have been delineated by the aquatic specialist. This will occur as a result of development of the proposed WEF and associated infrastructure, including the development of internal roads and drainage line crossings (as indicated in the Aquatic Biodiversity Assessment and combined sensitivity mapping).
Activity 24 (ii)	The development of road: (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 m; but excluding a road- (a) which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter.	Internal service roads will need to be established for the proposed project in order to access the wind turbines. The internal service roads will comprise of both existing and new roads. Existing unnamed roads will be used as far as possible and will be upgraded, expanded, and compacted. New roads will be constructed in the absence of existing roads. A temporary road corridor of up to 12 m will be impacted during the construction phase. This will be rehabilitated after the completion of construction activities to allow for a permanent 6 m wide road surface, with side drains on one or both sides where necessary. All roads may have underground cables running next to them. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles, temporary passing lanes, side drains, and/or stormwater control measures.
Activity 28 (ii)	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	The proposed project will be located on various affected farm portions, northwest of Beaufort West, in the Beaufort West Local Municipality (which falls within the Central Karoo District Municipality) in the Western Cape province; and the Karoo Hoogland Local Municipality and Ubuntu Local Municipality (which respectively fall within the Namakwa District Municipality and Pixley ka Seme District Municipality) in the Northern Cape. The land within the study area has previously been utilised for agricultural activities and is currently being used for such activities such as grazing. The proposed project, which is considered a commercial/industrial development, will have an estimated footprint in excess of 1 ha (approximately 124 ha). The proposed project will also entail the construction of various infrastructure and structures (such as the wind turbines (including foundations and hardstand/laydown), 132 kV overhead power line and its associated infrastructure (such as the service road), on-site substation, BESS, laydown area, internal roads, and various ancillary infrastructure such as inverter/transformer stations, on-site medium voltage cables, internal roads, storm water infrastructure, fencing, O&M building / centre, site office,

		workshop, staff lockers, bathrooms / ablutions, warehouse, and guard house etc.). This will constitute infrastructure with a physical footprint of more than 1 ha.
Activity 48 (i) (a) and (c)	The expansion of: (i) infrastructure or structures where the physical footprint is expanded by 100 square metre or more; Where such expansion occurs: (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse. excluding- (aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 23 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such expansion occurs within an urban area; or (ee) where such expansion occurs within existing roads, road reserves or railway line reserves.	Internal service roads will need to be established for the proposed project in order to access the wind turbines. The internal service roads will comprise of both existing and new roads. Existing unnamed roads will be used as far as possible and will be upgraded, expanded, and compacted. New roads will be constructed in the absence of existing roads. A temporary road corridor of up to 12 m will be impacted during the construction phase. This will be rehabilitated after the completion of construction activities to allow for a permanent 6 m wide road surface, with side drains on one or both sides where necessary. All roads may have underground cables running next to them. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles, temporary passing lanes, side drains, and/or stormwater control measures. The proposed project will therefore require upgrading, expansion and compaction of existing roads that are used for internal service roads within the project area, as well as watercourse crossing upgrades. The total footprint of the upgrades to be undertaken on the existing roads are in excess of 100 m^2. The existing road expansion, upgrading and compaction, as well as upgrading of drainage crossings, will occur within small tributaries, watercourses, and wetlands, and within 32 m of these aquatic features, which have been delineated by the aquatic specialist. The internal roads and drainage line crossings have also been indicated in the Aquatic Biodiversity Assessment.
Activity 56 (i)	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre - (i) where the existing reserve is wider than 13,5 metres; excluding where widening or lengthening occur inside urban areas.	Internal service roads will need to be established for the proposed project in order to access the wind turbines. The internal service roads will comprise of both existing and new roads. Existing unnamed roads will be used as far as possible and will be upgraded, expanded, and compacted. New roads will be constructed in the absence of existing roads. A temporary road corridor of up to 12 m wide will be impacted during the construction phase. This will be rehabilitated after the completion of construction activities to allow for a permanent 6 m wide road surface, with side drains on one or both sides where necessary. All roads may have underground cables running next to them. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles, temporary passing lanes, side drains, and/or stormwater control measures.

		The Traffic Impact Assessment states that minor roads in the area have a functional classification of level 5, and are categorised as a Local Access Road, consisting of a path which provides access to / on the properties within a 20 m servitude. Therefore, the road reserve of the existing roads within farm portions is deemed 20 m wide. The proposed project will therefore require upgrading, expansion and compaction of existing roads that are used for internal service roads within the project area, as well as watercourse crossing upgrades. The existing roads will be widened by more than 6 m in some places.
Activity No(s):	**Relevant Scoping and EIA Activities as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended**	**Description of the portion of the proposed project to which the applicable listed activity relates.**
Activity 1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs — (a) within an urban area; or (b) on existing infrastructure.	The proposed project is a Wind Energy Facility (i.e., facility for the generation of electricity from a renewable resource) with an estimated capacity of up to 270 MW. The proposed project will be located on various affected farm portions, northwest of Beaufort West, in the Beaufort West Local Municipality (which falls within the Central Karoo District Municipality) in the Western Cape province; and the Karoo Hoogland Local Municipality and Ubuntu Local Municipality (which respectively fall within the Namakwa District Municipality and Pixley ka Seme District Municipality) in the Northern Cape. Therefore, the proposed project is situated outside of an urban area.
Activity 15	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for: (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The proposed WEF will have an estimated footprint in excess of 20 ha to accommodate the footprints of wind turbine generator foundations, on-site substation and pylon foundation footprints, building infrastructure, and BESS (with an approximate combined footprint of 124 ha). As a result, more than 20 ha of indigenous vegetation could be removed for the construction of the proposed WEF. The study area is entirely located in the Eastern Upper Karoo (Mucina & Rutherford, 2006) vegetation type. Additionally, field assessments conducted on-site indicate the presence of distinct patches of Upper Karoo Hardeveld, along with extensive areas of riparian vegetation mapped as part of the Bushmanland Vloere vegetation type.
Activity No(s):	**Provide the relevant Basic Assessment Activities as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended**	**Description of the portion of the proposed project to which the applicable listed activity relates.**
Activity 4 [(g) (ii) (bb), (cc), (ee)] and [(i) (ii) and (aa)]	The development of a road wider than 4 metres with a reserve less than 13,5 metres. (g) Northern Cape (ii) Outside urban areas:	Internal service roads will need to be established for the proposed project in order to access the wind turbines. The internal service roads will comprise of both existing and new roads. Existing unnamed roads will be used as far as possible and will be upgraded, expanded, and compacted. New roads will be constructed in the absence of existing roads. A 12 m wide road corridor will

	(bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (i) Western Cape (ii) Areas outside urban areas: (aa) areas containing indigenous vegetation	be temporarily impacted upon during construction and rehabilitated to 6 m wide after construction. The proposed project will be located on various affected farm portions, northwest of Beaufort West, in the Beaufort West Local Municipality (which falls within the Central Karoo District Municipality) in the Western Cape province; and the Karoo Hoogland Local Municipality and Ubuntu Local Municipality (which respectively fall within the Namakwa District Municipality and Pixley ka Seme District Municipality) in the Northern Cape. **Northern Cape** The proposed project will take place outside of an urban area in the Northern Cape, on sites that intersect with a National Protected Area Expansion Strategy (NPAES) Focus area; sensitive areas identified in the Namakwa District Municipality Environmental Management Framework (2011), and Critical Biodiversity Areas (CBA 1) as identified in the 2024 Northern Cape Biodiversity Spatial Plan (NC BSP). The NC BSP indicates that the western boundary of the study area is located within a CBA 1 with small sections of the site located in Other Natural Area (ONA). Micrositing will be considered for the following infrastructure components, which are either fully or partially located with the CBA 1: Turbine 5, Hardstands 5, 2, and 4, and approximately 1 km of internal road. Only one turbine (i.e., Turbine 5) of the proposed WEF intersects with the NPAES focus area, which is minor within the larger landscape and will not have a significant impact on the NPAES focus areas. **Western Cape** The proposed project will take place outside of an urban area in the Western Cape, on sites that contain indigenous vegetation. The study area is entirely located in the Eastern Upper Karoo (Mucina & Rutherford, 2006) vegetation type. Additionally, field assessments conducted on-site indicate the presence of distinct patches of Upper Karoo Hardeveld, along with extensive areas of riparian vegetation mapped as part of the Bushmanland Vloere vegetation type.
Activity 14 (ii) (a) and (c); [(g) (ii) (bb) (dd) (ff)] and [(i) (i) (ff)]	The development of – (ii) infrastructure or structures with a physical footprint of 10 square metres or more;	The proposed project will be located on various affected farm portions, northwest of Beaufort West, in the Beaufort West Local Municipality (which falls within the Central Karoo District Municipality) in the Western Cape

	where such development occurs – (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. (g) Northern Cape (ii) Outside urban areas: (bb) National Protected Area Expansion Strategy Focus areas; (dd) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (i) Western Cape (i) Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	province; and the Karoo Hoogland Local Municipality and Ubuntu Local Municipality (which respectively fall within the Namakwa District Municipality and Pixley ka Seme District Municipality) in the Northern Cape. The proposed project will entail the construction of various infrastructure and structures (such as the wind turbines (including foundations and hardstand/laydown), 132 kV overhead power line and its associated infrastructure (such as the service road), on-site substation, BESS, laydown area, internal roads, and various ancillary infrastructure such as O&M building / centre, site office, workshop, staff lockers, bathrooms / ablutions, warehouse, and guard house etc.). These structures will have an estimated combined footprint of approximately 124 ha. The infrastructure and structures will exceed a footprint of 10 m^2 and some may occur within small tributaries, watercourses, and wetlands, and 32 m of these aquatic features, which have been delineated by the aquatic specialist. **Northern Cape** The proposed project will take place outside of an urban area in the Northern Cape, on sites that intersect with a NPAES Focus area; sensitive areas identified in the Namakwa District Municipality Environmental Management Framework (2011), and CBAs as identified in the 2024 NC BSP. The NC BSP indicates that the western boundary of the study area is located within a CBA 1 with small sections of the site located in ONA. Micrositing will be considered for the following infrastructure components, which are either fully or partially located with the CBA 1: Turbine 5, Hardstands 5, 2, and 4, and approximately 1 km of internal road. Only one turbine (i.e., Turbine 5) of the proposed WEF intersects with the NPAES focus area, which is minor within the larger landscape and will not have a significant impact on the NPAES focus areas. **Western Cape** The proposed project will take place outside of an urban area in the Western Cape, on a site that contains ESAs and CBAs in terms of the 2023 Western Cape Biodiversity Spatial Plan (WC BSP) that was adopted on 13 December 2024 (in Gazette Extraordinary 9017). The WC BSP indicates that the majority of the study area is located within ONAs with ESA 2 terrestrial

		features interspersed throughout the landscape and some areas of terrestrial CBA 2. Additionally, the watercourses are all mapped as aquatic ESA 1, except for the mainstem of the Elandsfontein River that is mapped as Nama Karoo Ephemeral Upper Foothill CBA 1. Aquatic ESA 2 occurs where there is localised disturbance within the watercourses. Linear infrastructure (including internal access roads and power lines) crosses the aquatic ESAs and CBA, which is permissible and subject to the stipulated mitigation measures. There are no turbines located in the terrestrial CBA 2, but sections of Hardstands 20 and 21 intersect with it. Micrositing should be considered for these two infrastructure components to avoid the CBAs.
Activity 18 [(g) (ii) (bb) (cc) (ii)] and [(i) (ii) and (aa)]	The widening of a road by more than 4 meters, or the lengthening of a road by more than 1 kilometre. (g) Northern Cape (ii) Outside urban areas: (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ii) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland; (i) Western Cape (ii) All areas outside urban areas: (aa) Areas containing indigenous vegetation	Internal service roads will need to be established for the proposed project in order to access the wind turbines. The internal service roads will comprise of both existing and new roads. Existing unnamed roads will be used as far as possible and will be upgraded, expanded, and compacted. New roads will be constructed in the absence of existing roads. A temporary road corridor of up to 12 m wide will be impacted during the construction phase. This will be rehabilitated after the completion of construction activities to allow for a permanent 6 m wide road surface, with side drains on one or both sides where necessary. All roads may have underground cables running next to them. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles, temporary passing lanes, side drains, and/or stormwater control measures. The proposed project will therefore require upgrading, expansion and compaction of existing roads that are used for internal service roads within the project area, as well as watercourse crossing upgrades. The existing roads will be widened by more than 4 m in some places. **Northern Cape** The proposed project will take place outside of an urban area in the Northern Cape, on sites that intersect with a NPAES Focus area; sensitive areas identified in the Namakwa District Municipality Environmental Management Framework (2011), and CBAs as identified in the 2024 NC BSP. The NC BSP indicates that the western boundary of the study area is located within a CBA 1 with small sections of the site located in ONA. Micrositing will

		be considered for the following infrastructure components, which are either fully or partially located with the CBA 1: Turbine 5, Hardstands 5, 2, and 4, and approximately 1 km of internal road. Only one turbine (i.e., Turbine 5) of the proposed WEF intersects with the NPAES focus area, which is minor within the larger landscape and will not have a significant impact on the NPAES focus areas. The widening will occur within small tributaries, watercourses, and wetlands, and 100 m of these aquatic features, which have been delineated by the aquatic specialist. **Western Cape** The proposed projects will take place outside of an urban area in the Western Cape, on sites that contain indigenous vegetation. The study area is entirely located in the Eastern Upper Karoo (Mucina & Rutherford, 2006) vegetation type. Additionally, field assessments conducted on-site indicate the presence of distinct patches of Upper Karoo Hardeveld, along with extensive areas of riparian vegetation mapped as part of the Bushmanland Vloere vegetation type.
Activity 23 (ii) (a) (c) [(g) (ii) (bb) (cc) (ee)] and [(i) (i) (ff)]	The expansion of: (ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs: a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse, excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. (g) Northern Cape (ii) Outside urban areas: (bb) National Protected Area Expansion Strategy Focus areas;	The proposed project will be located on various affected farm portions, northwest of Beaufort West, in the Beaufort West Local Municipality (which falls within the Central Karoo District Municipality) in the Western Cape province; and the Karoo Hoogland Local Municipality and Ubuntu Local Municipality (which respectively fall within the Namakwa District Municipality and Pixley ka Seme District Municipality) in the Northern Cape. Internal service roads will need to be established for the proposed project in order to access the wind turbines. The internal service roads will comprise of both existing and new roads. Existing unnamed roads will be used as far as possible and will be upgraded, expanded, and compacted. New roads will be constructed in the absence of existing roads. A temporary road corridor of up to 12 m will be impacted during the construction phase. This will be rehabilitated after the completion of construction activities to allow for a permanent 6 m wide road surface, with side drains on one or both sides where necessary. All roads may have underground cables running next to them. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles, temporary passing lanes, side drains, and/or stormwater control measures.

	(cc) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (i) Western Cape (i) Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans	The proposed project will therefore require upgrading, expansion and compaction of existing roads that are used for internal service roads within the project area, as well as watercourse crossing upgrades. The total footprint of the upgrades to be undertaken on the existing roads are in excess of 10 m^2. The existing road expansion, upgrading and compaction, as well as upgrading of drainage crossings, will occur within small tributaries, watercourses, and wetlands, and within 32 m of these aquatic features, which have been delineated by the aquatic specialist. The internal roads and drainage line crossings have also been indicated in the Aquatic Biodiversity Assessment. **Northern Cape** The proposed project will take place outside of an urban area in the Northern Cape, on sites that intersect with a NPAES Focus area; sensitive areas identified in the Namakwa District Municipality Environmental Management Framework (2011), and CBAs as identified in the 2024 NC BSP. The NC BSP indicates that the western boundary of the study area is located within a CBA 1 with small sections of the site located in ONA. Micrositing will be considered for the following infrastructure components, which are either fully or partially located with the CBA 1: Turbine 5, Hardstands 5, 2, and 4, and approximately 1 km of internal road. Only one turbine (i.e., Turbine 5) of the proposed WEF intersects with the NPAES focus area, which is minor within the larger landscape and will not have a significant impact on the NPAES focus areas. **Western Cape** The proposed project will take place outside of an urban area in the Western Cape, on a site that contains ESAs and CBAs in terms of the 2023 WC BSP The majority of the study area is located within ONAs with ESA 2 terrestrial features interspersed throughout the landscape and some areas of terrestrial CBA 2. Additionally, the watercourses are all mapped as aquatic ESA 1, except for the mainstem of the Elandsfontein River that is mapped as Nama Karoo Ephemeral Upper Foothill CBA 1. Aquatic ESA 2 occurs where there is localised disturbance within the watercourses.

		Linear infrastructure (including internal access roads and power lines) crosses the aquatic ESAs and CBA, which is permissible and subject to the stipulated mitigation measures. There are no turbines located in the terrestrial CBA 2, but sections of Hardstands 20 and 21 intersect with it. Micrositing should be considered for these two infrastructure components to avoid the CBAs.

4.4 Screening Tool

This section provides a description of the Screening Tool requirements in terms of recommended specialist assessments and assigned sensitivity ratings.

4.4.1 Specialist Assessments Identified by the Screening Tool

Based on the selected classification, the Screening Tool provides a list of specialist assessments that should be undertaken as part of the Scoping and EIA 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) and 30 October 2020 (GN 1150, as amended in July 2023). The classifications that apply to the proposed project are:

1. **Utilities Infrastructure; Electricity; Generation; Renewable; Wind**
2. **Utilities Infrastructure; Electricity; Distribution and Transmission; Powerline**
3. **Utilities Infrastructure; Electricity; Distribution and Transmission; Substation**

The following list of Specialist Assessments have been identified by the Screening Tool for inclusion in the Scoping and EIA Processes (Table 4.3). **The Screening Tool Report notes that it is the responsibility of the EAP to confirm this list and to motivate in the EIA Report, the reason for not including any of the identified specialist assessments, where relevant**.

As discussed at the Pre-Application Meeting held on 7 February 2023, the EAP has recommended that certain studies are not required. Refer to the discussion below.

Table 4.3: List of Specialist Assessments identified by the Screening Tool for the proposed project

Specialist Assessment Required by the Screening Tool		Screening Tool Applicability - WEF, Substation or Power Line?	Study undertaken in Scoping and EIA Process?	Sensitivity allocated on the 2025 Screening Tool Report [Study Area]	Verified Sensitivity by the Specialist/EAP [Study Area][16]	Type of Assessment undertaken in Scoping and EIA Process or Motivation/Feedback for not undertaking the recommended study	Appendix of EIA Report for Specialist Report (including SSV)
1	Agricultural Impact Assessment	• WEF • Substation • Power Line	Yes	**WEF:** Mainly Low and Medium Sensitivity, with some minor areas of Very High and High Sensitivity **Substation:** Medium Sensitivity **Power Line:** Mainly Low Sensitivity, with some Medium Sensitivity	Predominately Medium and Low sensitivity (with some isolated patches of cropland, which are very high and high sensitivity, that are avoided by the project footprint).	Protocol GN 320: Part B: Agriculture (Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Agricultural Resources by **Onshore Wind** and/or Solar PV Energy Generation Facilities where the Electricity Output is 20 MW or more): **Compliance Statement**	Appendix G.1
2	Landscape/Visual Impact Assessment	• WEF • Power Line	Yes	**WEF:** Mainly Very High Sensitivity **Substation:** Not Applicable **Power Line:** Not Applicable	Ranges from Very High (mainly due to within 5 km of homes/farmsteads), High, Medium, to Low Sensitivity. The specialist confirmed that the overall sensitivity is Medium.	Protocol GN 320: Part A: Site Sensitivity Verification; and Appendix 6 of the 2014 NEMA EIA Regulations (as amended): **Impact Assessment**	Appendix G.5
	Flicker Impact Assessment	• WEF	Yes	**WEF:** Mainly Low Sensitivity with some Very High Sensitivity **Substation:** Not Applicable **Power Line**: Not Applicable	Very High Sensitivity		
3	Archaeological and Cultural Heritage Impact Assessment	• WEF • Substation • Power Line	Yes	**WEF:** Low Sensitivity **Substation:** Low Sensitivity **Power Line:** Low Sensitivity	Mainly Low Sensitivity, with some heritage features allocated Very High Sensitivity	Protocol GN 320: Part A: Site Sensitivity Verification; and Appendix 6 of the 2014 NEMA EIA Regulations (as amended): **Impact Assessment**	Appendix G.6
4	Palaeontology Impact Assessment	• WEF • Substation • Power Line	Yes	**WEF:** Very High Sensitivity **Substation:** Very High Sensitivity **Power Line:** Very High Sensitivity	Very High Sensitivity	Protocol GN 320: Part A: Site Sensitivity Verification; and Appendix 6 of the 2014 NEMA EIA Regulations (as amended): **Impact Assessment**	Appendix G.7

[16] The sensitivity is described for the study area. However, the footprints avoid all no-go areas. Refer to Appendix G for additional information.

Specialist Assessment Required by the Screening Tool		Screening Tool Applicability - WEF, Substation or Power Line?	Study undertaken in Scoping and EIA Process?	Sensitivity allocated on the 2025 Screening Tool Report [Study Area]	Verified Sensitivity by the Specialist/EAP [Study Area][16]	Type of Assessment undertaken in Scoping and EIA Process or Motivation/Feedback for not undertaking the recommended study	Appendix of EIA Report for Specialist Report (including SSV)
5	Terrestrial Biodiversity Impact Assessment	• WEF • Substation • Power Line	Yes	**WEF:** Mainly Low Sensitivity with some Very High Sensitivity **Substation:** Low Sensitivity **Power Line:** Low Sensitivity	Very High, High, Medium and Low Sensitivity	Protocol GN 320: Part B: Biodiversity (Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Terrestrial Biodiversity): **Impact Assessment** Note that the reporting for Terrestrial Biodiversity, Terrestrial Plant Species and Terrestrial Animal Species is combined in one report.	Appendix G.2
6	Aquatic Biodiversity Impact Assessment	• WEF • Substation • Power Line	Yes	**WEF:** Mainly Low Sensitivity with some Very High Sensitivity **Substation:** Low Sensitivity **Power Line:** Mainly Low Sensitivity with some Very High Sensitivity	High and Medium Sensitivity	Protocol GN 320: Part B: Biodiversity (Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Aquatic Biodiversity): **Impact Assessment** GN 3717 was promulgated on 28 July 2023 which amends the terrestrial plant and animal species protocol that was published in GN 1150 in October 2020. The amendment entails the removal of the term "terrestrial" from the protocol to ensure that it applies to all plant and animal species, including freshwater species. However, the Aquatic Biodiversity specialist was appointed in 2021, prior to the promulgation of the amendment in GN 3717. Therefore, the amendment is not applicable to the aquatic specialist report.	Appendix G.3
7	Avifauna Impact Assessment	• WEF • Power Line	Yes	**WEF:** Low Sensitivity [The Low sensitivity is for the specific Avian Theme; however, bird sensitivity is also captured under the Animal Species theme, described below. Note that the Vulture Species Theme is also Low Sensitivity] **Power Line:** Not Applicable	Very High, High and Medium Sensitivity	Protocol GN 320 –Part B – Avifauna (Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Avifaunal Species by Onshore Wind Energy Generation Facilities where the Electricity Output is 20 Megawatts or more): **Impact Assessment**	Appendix G.4

Specialist Assessment Required by the Screening Tool		Screening Tool Applicability - WEF, Substation or Power Line?	Study undertaken in Scoping and EIA Process?	Sensitivity allocated on the 2025 Screening Tool Report [Study Area]	Verified Sensitivity by the Specialist/EAP [Study Area][16]	Type of Assessment undertaken in Scoping and EIA Process or Motivation/Feedback for not undertaking the recommended study	Appendix of EIA Report for Specialist Report (including SSV)
8	Civil Aviation Assessment	• WEF • Power Line	Yes (Site Sensitivity Verification)	**WEF:** Low Sensitivity **Power Line:** Low Sensitivity	Low Sensitivity	Protocol GN 320: Part B: Civil Aviation (Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Civil Aviation Installations): **Site Sensitivity Verification**	Appendix G.14
9	Defence Assessment	• WEF	Yes (Site Sensitivity Verification)	**WEF:** Low Sensitivity	Low Sensitivity	Protocol GN 320: Part B: Defence (Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Defence Installations): **Site Sensitivity Verification**	Appendix G.15
10	Radio Frequency Interference (RFI) Assessment	• WEF • Power Line	No	**WEF:** Very High Sensitivity **Power Line:** Not Applicable	See note below	Motivation not to undertake this specialist assessment is provided in Section 4.4.2 below.	Motivation not to undertake this specialist assessment is provided in Section 4.4.2 below.
11	Noise Impact Assessment	• WEF	Yes	**WEF:** Mainly Low Sensitivity with some Very High Sensitivity	Very High and Low Sensitivity	Protocol GN 320 –Part B – Noise (Protocol for the specialist assessment and minimum report content requirements for noise impacts): **Impact Assessment**	Appendix G.13
12	Bat Impact Assessment *[Not listed on the Screening Tool as a specialist study]*	• WEF	Yes	**WEF:** Mainly Low Sensitivity with some High Sensitivity	High and Low Sensitivity	Protocol GN 320 – Part A: Site Sensitivity Verification; and Appendix 6: **Impact Assessment**	Appendix G.12
13	Traffic Impact Assessment	• WEF	Yes	Not applicable (no theme indicated)	Not applicable (no theme indicated)	Appendix 6 of the 2014 NEMA EIA Regulations (as amended): **Impact Assessment** There are no themes on the Screening Tool that currently relate to traffic or transport features that could be verified on site. Hence, Part A of GN 320 (Site Sensitivity Verification) is not applicable in this regard.	Appendix G.9

Specialist Assessment Required by the Screening Tool		Screening Tool Applicability - WEF, Substation or Power Line?	Study undertaken in Scoping and EIA Process?	Sensitivity allocated on the 2025 Screening Tool Report [Study Area]	Verified Sensitivity by the Specialist/EAP [Study Area][16]	Type of Assessment undertaken in Scoping and EIA Process or Motivation/Feedback for not undertaking the recommended study	Appendix of EIA Report for Specialist Report (including SSV)
14	Geotechnical Assessment	• WEF • Substation • Power Line	Yes	Not applicable (no theme indicated)	Not applicable (no theme indicated)	Appendix 6 of the 2014 NEMA EIA Regulations (as amended): **Impact Assessment** There are no themes on the Screening Tool that currently relate to Geotechnical features that could be verified on site. Hence Part A of GN 320 (Site Sensitivity Verification) is not applicable in this regard.	Appendix G.11
15	Socio-Economic Assessment	• WEF	Yes	Not applicable (no theme indicated)	Not applicable (no theme indicated)	Appendix 6 of the 2014 NEMA EIA Regulations (as amended): **Impact Assessment** There are no themes on the Screening Tool that currently relate to Socio-Economic features that could be verified on site. Hence Part A of GN 320 (Site Sensitivity Verification) is not applicable in this regard.	Appendix G.8
16	Plant Species Assessment	• WEF • Substation • Power Line	Yes	**WEF:** Low Sensitivity **Substation:** Low Sensitivity **Power Line:** Low Sensitivity	Low Sensitivity	Protocol GN 1150 and GN 3717: Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Plant Species: **Compliance Statement** Note that the reporting for Terrestrial Biodiversity, Terrestrial Plant Species and Terrestrial Animal Species is combined in one report.	Appendix G.2
17	Animal Species Assessment	• WEF • Substation • Power Line	Yes	**WEF:** Medium Sensitivity **Substation:** Medium Sensitivity **Power Line:** Medium Sensitivity	Very High, High, Medium, and areas of Low Sensitivity	Protocol GN 1150 and GN 3717: Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Animal Species: **Impact Assessment** Note that the reporting for Terrestrial Biodiversity, Terrestrial Plant Species and Terrestrial Animal Species is combined in one report.	Appendix G.2

4.4.2 Additional Specialist Assessments

It must be noted that the Screening Tool did not identify the need for the following specialist assessment, however this study has been commissioned as part of the Scoping and EIA Process to ensure that all potential impacts resulting from the proposed project are considered as best as possible:

- **BESS High Level Safety, Health and Environment Risk Assessment:** The Risk Assessment is included in Appendix G.10 of this EIA Report. This is a technical report and does not need to fulfil the requirements of the 2014 NEMA EIA Regulations (as amended).

4.4.3 RFI Assessment

The Screening Tool identified the need for an RFI Assessment. However, an RFI Assessment was not undertaken as part of the Scoping and EIA Process because the proposed project does not pose an EMI or RFI risk to the SKA. Refer to Figure 4.2 for the location of the proposed project in relation to the SKA and KCAAA.

Furthermore, the SARAO was consulted to ascertain whether the proposed project will pose a risk of interference to the nearest SKA radio telescope. On 16 March 2023, the SARAO confirmed that the project represents a low risk of interference to the nearest SKA radio telescope with a compliance surplus of 28.42 dBm/Hz. Accordingly, they had no objection to the proposed project.

Based on this, the EAP is of the reasoned opinion that an RFI Assessment is not warranted.

4.5 Overview of Approach to Preparing the EIA Report and EMPr

The EIA Report has been compiled in line with the requirements of Appendix 3 of the 2014 NEMA EIA Regulations (as amended). Refer to Chapter 1 of this EIA Report for feedback on how these requirements have been met.

The specialist studies / inputs / technical studies have been undertaken based on compliance with relevant legislation and based on the Terms of Reference indicated in Section 4.9 of this chapter, as well as Appendix G of this EIA Report, where relevant. The results of the specialist studies / inputs / technical studies and other relevant project information, as well as research undertaken for the proposed projects have been integrated into the EIA Report.

The Draft EIA Report is currently being released for a 30-day I&AP and authority comment period. I&APs registered on the project database will be notified in writing of the release of the Draft EIA Report for comment.

Comments raised through written correspondence (emails and letters) will be captured in a Comments and Responses Report and appended to the Final EIA Report that will be submitted to the DFFE for decision-making. Refer to Section 4.6 of this chapter for additional information regarding this process.

The EIA Report include EMPrs (Appendix H.1 to H.3) which have been prepared in compliance with the relevant regulations. The content of an EMPr must either contain the information set out in Appendix 4 of the 2014 NEMA EIA Regulations (as amended) or must be a Generic EMPr relevant to an application as identified and gazetted by the Minister in a GN. As part of the 2016 EGI SEA, a Generic EMPr was compiled for the development and expansion of (a) overhead electricity transmission and distribution infrastructure; and (b) substation infrastructure for the transmission and distribution of electricity. On 2 March 2018, these two Generic EMPrs were gazetted in GG 41473, GN 162 and GN 163, for public comment for a period of 45 days. On 22 March 2019, these two Generic EMPrs were gazetted for implementation, in GG 42323, GN 435. The following EMPrs have been compiled for the proposed projects and comply with the following legislation noted in Table 4.4.

Table 4.4: EMPrs compiled in the EIA Phase

Projects	Environmental Management Programme
Eland WEF and Associated Infrastructure	EMPr for the WEF (Appendix 4 of the 2014 NEMA EIA Regulations (as amended)). This is included in Appendix H.1 of the EIA Report.
Eland WEF On-Site Substation	Generic EMPr for the WEF On-Site Substation (GG 42323, GN 435, Generic EMPr for Substations). This is included in Appendix H.2 of the EIA Report.
Eland WEF Power Line	Generic EMPr for the 132 kV Overhead Power Line (GG 42323, GN 435, Generic EMPr for Power Lines). This is included in Appendix H.3 of the EIA Report.

The EMPrs compiled for this proposed project therefore separately comply with Appendix 4 of the 2014 NEMA EIA Regulations (as amended) for the proposed WEF and associated infrastructure; the requirements of the gazetted EMPr for substation infrastructure (Gazette 42323, GN 435) for the WEF On-Site Substation (as Activity 11 of Listing Notice 1 is included in this application); as well as the requirements of the gazetted EMPr for overhead power line infrastructure (Gazette 42323, GN 435) for the 132 kV overhead power line (as Activity 11 of Listing Notice 1 is included in this application).

The EMPrs are based broadly on the environmental management philosophy presented in the ISO 14001 standard, which embodies an approach of continual improvement. Actions in the EMPr have been drawn primarily from the impact management actions in the specialist assessments for the construction and operational phases of the projects. If the project components are decommissioned or re-developed this will need to be done in accordance with the relevant environmental standards and clean-up/remediation requirements applicable at the time. However, general management actions for the decommissioning phase have been provided.

4.6 Public Participation Process

4.6.1 Introduction to the PPP

This section provides an overview of the tasks that have been undertaken in the EIA Phase, with a particular emphasis on providing a clear record of the PPP to has been followed. An integrated PPP was undertaken for all the proposed Eland and Windy Plains WEFs. The information presented in Section 4.6 of this chapter applies to both projects.

The integrated PPP for the proposed projects ensured that all public participation documents (such as newspaper advertisements, notification letters, emails etc.) served to notify 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 proximity of the sites (i.e. the proposed projects will take place within the same geographical area) and that proposed projects entail the same type of activity (i.e. generation of energy using a renewable source (i.e. wind).

The PPP was driven by a stakeholder engagement process that included inputs from authorities, I&APs, technical specialists and the Project Developer. 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 Environmental Assessment 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 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 Competent Authority 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 briefing sessions, public meetings, written submissions or direct contact with members of the EIA 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, the PPP aims to generate issues that are representative of societal sectors, not each individual and will be designed to be inclusive of a broad range of sectors relevant to the proposed project; and
- 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 the NEMA EIA Regulations is also being considered during this Scoping and EIA Process. The Western Cape DEA&DP, (2013) Guideline on Public Participation, EIA Guideline and Information Document Series[17], is also being consulted.

It is important to note that proof of PPP undertaken during the Scoping Phase (i.e. site notice board placement, newspaper advertisement placement, correspondence and proof of correspondence sent to stakeholders for the release of the Draft Scoping Report, comments received from stakeholders during the 30-day comment period on the Draft Scoping Report), is captured in Appendix E Part 1 of this EIA Report. The Issues and Responses Trail for the Scoping Phase is included in Appendix E Part 2 of this EIA Report. In addition, Appendix E Part 3 of this EIA Report includes the proof of submission of the Final Scoping Report to the DFFE; proof of correspondence sent to stakeholders for the notification of the submission and acceptance of the Final Scoping Report; and the proof of correspondence sent to stakeholders for the notification of the re-submission of the current Applications for EA. The DFFE acceptance of the Final Scoping Report is included in Appendix E Part 4 of this EIA Report.

The comments received following the submission of the Final Scoping Report to the DFFE and before the release of this Draft EIA Report for a 30-day comment period are included in Appendix E Part 5 of this EIA Report, and the associated comments and responses Trail is included in Appendix E Part 6 of this EIA Report.

Proof of PPP undertaken thus far during the EIA Phase is captured in Appendix E Part 7 of this EIA Report. The EIA Phase PPP is discussed below.

The key steps in the PPP for this Scoping and EIA Process are described below and are also illustrated in Figure 4.3. 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 will be undertaken to provide notice to all potential and registered I&APs of the proposed project, as described below.

[17] DEA&DP (2013) Guideline on Public Participation, EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning (DEA&DP), March 2013.

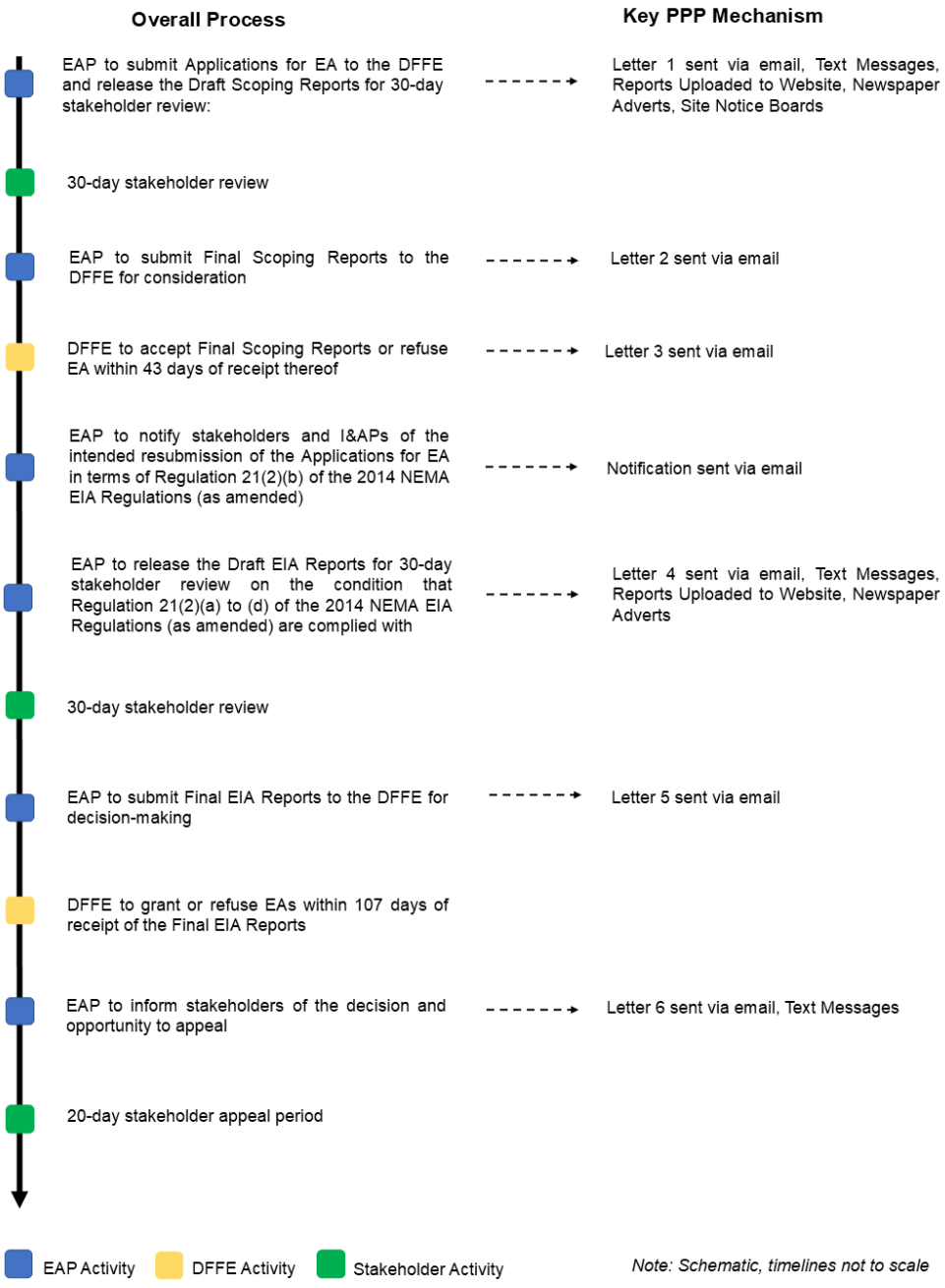


Figure 4.3: Overview of the Scoping and EIA Process and PPP

4.6.2 Pre-Application Consultation with the DFFE

A request for a Pre-Application Meeting was submitted to the DFFE on 26 January 2023 after which the EAP received a response from the DFFE on 27 January 2023 (Reference Number: 2023-01-0030). The DFFE later confirmed via email that a Pre-Application Meeting was scheduled for 7 February 2023. The Pre-Application Meeting was undertaken in order to discuss and agree on various aspects prior to release the Draft Scoping Report. The following points were discussed with the DFFE:

- Description of the proposed project;
- Discussion and confirmation of the specialist assessments and compliance statements to be undertaken;
- Discussion on the approach towards the specialist reporting;
- Discussion on the approach towards the BA and S&EIA reporting;
- Discussion on the proposed Public Participation Process to be undertaken;
- Discussion on the preliminary proposed project schedule and overall process for the EIAs and BA, including the applicable Listed Activities; and
- Discussion on the Cumulative Impact Assessment approach.

Refer to Appendix F.1 of this Scoping Report for a copy of the Pre-Application Meeting Request Form that was 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; Appendix F.4 for the submission of the Pre-Application Meeting Notes to the DFFE; and Appendix F.5 for 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 22 February 2023 and approved by the DFFE on 28 February 2023. Note that the DFFE confirmed on 17 September 2025 via email that a second pre-application was not required prior to the resubmission of the Northern Cluster WEF EA application forms. Refer to Appendix F.6 for a copy of the correspondence.

4.6.3 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*".

The proposed project constitutes non-linear activities, and landowner consent is therefore required for the affected properties listed in Chapter 2 of this report. Written consent has been obtained from the respective landowners of the affected farm portions on which the non-linear infrastructure is proposed to be located. The written consent has been included as an appendix to the Application for EA, which is being submitted to the DFFE, together with the Draft EIA Report for comment.

The proposed project also constitutes linear activities, i.e., the 132 kV power line to connect the on-site substation to the proposed Windy Plains WEF, and landowner consent is therefore not required for the affected properties.

4.6.4 Determination of Appropriate Consultation Measures, and I&AP Identification, Registration and the Creation of an Electronic Database

In order to accommodate the varying needs of I&APs and develop their capacity to participate in the process, information sharing forms an integral and ongoing component of the EIA Process to ensure effective public participation.

In line with Regulation 42 of the 2014 NEMA EIA Regulations (as amended) and prior to the commencement of the Scoping and EIA Processes (and advertising the EA Process in the local print media), an initial database of I&APs (including key stakeholders and Organs of State) was developed for the Scoping and EIA Processes. This was undertaken based on research. Appendix D of this EIA Report includes a copy of the latest I&AP Database, which indicates key stakeholders and all I&APs that have been added to the project database, which has been updated throughout the Scoping and EIA Processes based on requests for registration and de-registration received, as well as based on stakeholders providing comments, stakeholders communicated with, and additional research to obtain valid email addresses, where possible.

In line with Regulation 41 (2) (b) of 2014 NEMA EIA Regulations (as amended), the database includes the details of the following:

- Landowners of the affected farm portions;
- Occupiers of the affected farm portions;
- Landowners of the neighbouring adjacent farm portions;
- The municipal councillors of the wards in which the proposed project will be undertaken;
- The municipality which has jurisdiction in the area (i.e. Beaufort West Local Municipality, Karoo Hoogland Local Municipality, Ubuntu Local Municipality, CKDM, Namakwa District Municipality; and Pixley ka Seme District Municipality);
- Relevant Organs of State that have jurisdiction in respect of any aspect of the activity (e.g. the Western Cape DEA&DP, Department of Human Settlement, Water and Sanitation (DHSWS), DALRRD, DMRE, Eskom etc.); and
- Any other party as required by the Competent Authority.

In addition, the I&AP database includes the Competent Authority (i.e., DFFE); and potential and registered I&APs.

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 2014 NEMA EIA Regulations (as amended), in terms of the electronic database, I&AP details will be 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 Scoping and EIA 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.

In accordance with the Protection of Personal Information Act (Act 4 of 2013), the CSIR will conduct itself responsibly when collecting, processing, storing and sharing any personal information collected for the purposes of PPP in terms of the 2014 NEMA EIA Regulations (as amended) and the 2025 National Appeal Regulations. By registering as an I&AP and/or submitting information and comments, the stakeholder essentially consents to the collection, collation, processing, and storing of such information and the use and disclosure of such information for the aforementioned purpose, including for purposes of potential appeal processes whereby such information may be made available to an appellant in the case of an appeal to satisfy the requirements of Regulation 4 of the 2025 National Appeal Regulations[18].

The above is maintained on all correspondence sent throughout the EIA process. The stakeholders are also given an opportunity to send an email to the EAP if they wish to opt out of communications on the proposed project.

4.6.5 Site Notices

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 Scoping and EIA 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 key affected farm portions on which the proposed projects will be constructed, as well as at other strategic locations, such as well-known retail, public and/or government facilities in the wider region, as indicated in Table 4.5.

[18] CSIR Privacy Notice. Website: https://www.csir.co.za/csir-privacy-notice

Table 4.5: Site Notice Board Placement for the Proposed Project

Site Notice Placement	Coordinate Points (Degrees, Minutes, Seconds)	
	Longitude (x)	*Latitude (y)*
Entrance of the Central Karoo District	22°34'57,42984" E	32°20'55,02408" S
Entrance of the Beaufort West Library	22°35'0,49506" E	32°21'1,30284" S
Fraserburg turn off to the three Beaufort West Renewable Energy Clusters	22°26'55,9212" E	32°6'40,8546" S
Entrance to Southern Cluster	22°13'40,08756" E	32°6'44,71524" S
Entrance to Matjesfontein and Modderdrift	22°21'15,32952" E	32°3'19,81332" S
Entrance to the Northern Cluster	22°21'37,60272" E	31°47'17,46816" S
Sakrivierpoort Road	22°5'57,85116" E	31°50'29,62428" S

Refer to Appendix E Part 1 of this EIA Report for a copy of the content and proof of placement of the site notice boards. The site notice boards include the following, in compliance with Regulation 41 (3) of the 2014 NEMA EIA Regulations (as amended):

- The details of the proposed project that is subjected to public participation;
- Explanation that a Scoping and EIA procedure is applicable to the proposed project;
- The nature and location of the proposed project;
- Details on where further information on the proposed project can be obtained; and
- The manner in which and the person to whom representations in respect of the proposed projects can be made.

As indicated in Chapter 1 of this EIA Report, the original Application for EA for the Eland WEF lapsed in 2023, however in line with Regulation 21 (2) of the 2014 NEMA EIA Regulations (as amended), the application has been re-submitted within two years of acceptance of the Final Scoping Report, and all other provisions of Regulation 21 (2) have been met. As a result, the project does not need to go through the Scoping Phase again, and the Draft EIA Report is currently being made available for comment. Regulation 41 (5) of the 2014 NEMA EIA Regulations (as amended), states that where public participation is conducted in terms of Regulation 41 for an application or proposed application, sub-regulation 41 (2) (a), (b), (c) and (d) does not need to be complied with again during the public participation process contemplated in regulation 21 (2) (d), on condition that such process has been preceded by a public participation process which included compliance with sub-regulation 41 (2) (a), (b), (c) and (d); and (b) written notice is given to registered interested and affected parties regarding where the EIA Report and documents as contemplated in regulation 21 (2) (d) may be obtained, the manner in which and the person to whom representations on these reports or plans may be made and the date on which such representations are due. This has been complied with by way of the release of this Draft EIA Report for a 30-day comment period in terms of Regulation 21 (2) (d). Therefore, site notice boards have not been placed again on site.

4.6.6 Newspaper Advertisements

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 project, to invite I&APs to register on the project database, as well as to inform I&APs of the release of the Scoping Report for comment, the Scoping and EIA Processes was advertised in "*Die Courier*" local newspaper on 1 September 2023, which informed I&APs of the commencement of the 30-day comment period extending from 4 September 2023 to 6 October 2023 (excluding public holidays). The content of the newspaper advertisement complied with Regulation 41 (3) of the 2014 NEMA EIA Regulations (as amended) and also included the details of the project website, from where information available on the proposed project could be downloaded. Refer to Appendix E Part 1 of this EIA Report for a copy of the content of and proof of placement of the newspaper advertisement during the Scoping Phase.

For the EIA Phase, the availability of the EIA Report for the 30-day comment period is being advertised in "*Die Burger*" and "*Die Courier*". A copy of the proof of placement (i.e. tear sheets) of the newspaper advertisements will be provided in the Final EIA Report, however a copy of the content of these advertisements are included in Appendix E Part 7 of this EIA Report.

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).

4.6.7 PPP for the EIA Report Phase

In terms of Regulation 41 (6) of GN R326 the section below outlines the PPP for the EIA Phase of 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.

It is important to note that a notification was sent via email on 16 September 2025 in terms of Regulation 21(2)(b) of the 2014 NEMA EIA Regulations (as amended) to notify registered I&APs of the intended resubmission of the applications for EA for the proposed Eland and Windy Plains WEFs, and the upcoming release of the Draft EIA Reports. A copy of this correspondence is included in Appendix E Part 3 of this EIA Report.

4.6.7.1 Task 1 – I&AP Review of the Draft EIA Report and EMPrs (Current Stage)

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.

The first stage in the process entails the release of the Draft EIA Report for a 30-day comment period. Relevant stakeholders, Organs of State and I&APs have been informed of the review period in the manner described below, which summarises the PPP for the review of the Draft EIA Report.

- **Database Development and Maintenance:** In line with Regulation 42 of GN R326, an initial database of potential I&APs (including key stakeholders and Organs of State) was developed for the Scoping and EIA Processes and will be updated throughout the process. Refer to Appendix D of this EIA Report for a copy of the latest I&AP database that includes all I&APs that have registered, de-registered, and commented on the projects during the relevant phases. The database is also regularly updated based on research to obtain valid email addresses, where possible. Since the proposed project also partly extends into the Northern Cape, the relevant Northern Cape stakeholders have been included on the database.

- **Site Notice Boards:** As previously noted in this chapter, notice boards have been placed for the proposed projects. A copy of the content and proof of placement of the notice boards is included in Appendix E Part 1 of this EIA Report.

- **Advertisements to Register Interest:** As previously noted in this chapter, an advertisement has been placed in Afrikaans, English and Xhosa in "*Die Burger*" and "*Die Courier*", notifying I&APs of the availability of the Draft EIA Report for comment. A copy of the content of the newspaper advertisement is included in Appendix E Part 7 of this EIA Report.

- **Letter 3[19] to I&APs (Outcome of the consideration of the FSRs and commencement of EIA Phase**): Written notification of the outcome of the consideration of the FSRs and the commencement of the EIA Phase (i.e. Letter 3) was sent to all I&APs and Organs of State included on the updated project database via email, where email addresses are available. This letter was sent after the outcome of the consideration of the FSRs was received from the Competent Authority. Letter 3 included notification of the commencement of the EIA Phase for the proposed projects, and it was written in English. Copies of Letter 3 and emails sent are included in Appendix E Part 3 of this EIA Report.

- **Submission of the Applications for EA and Draft EIA Reports to the DFFE for Comment**: The Application Forms for EA have been submitted to the DFFE with the Draft EIA Reports via the DFFE One-Drive System and proof of upload was accordingly emailed to the DFFE. Proof of submission of the Draft EIA Reports for comment and Amended Applications for EA to the DFFE, and proof of upload to the DFFE One-Drive System will be appended to the Final EIA Report.

- **Letter 4 to I&APs (Availability of the Draft EIA Reports for public comment):** Written notification of the availability of the Draft EIA Reports (i.e. Letter 4) is being sent to all I&APs, Stakeholders and Organs of State included on the updated project database via email, where email addresses are available. This letter is being sent at the commencement of the 30-day review period on the Draft EIA Reports and includes information on the proposed projects and notification of the release and availability of the reports. Letter 4 is written in English. Proof of email, as well as copies of the Letter 4, will be included in the Final EIA Reports that will be submitted to the DFFE for decision-making.

[19] Note that Letters 1, 2, and 3 are also addressed in Chapter 4 of the Final Scoping Report and apply to the Scoping Phase.

- **Text Messaging:** SMS texts are also planned to be sent to all I&APs on the updated project database, where cell phone numbers are available, to inform them of the proposed projects and how to access the Draft EIA Reports, which are currently available for a 30-day comment period.

- **Local/Broader Networks:** Where possible, communication will be made during the EIA Phase with the relevant Municipal Ward Councillors / municipal representatives and/or similar community forums to query if it would be possible for them to send notifications of the proposed projects, report availability and executive summaries via their local networks (such as WhatsApp groups, Neighbourhood Watch groups, other social media mechanisms etc.).

- **30-day Comment Period:** As noted above, potential I&APs, including authorities and Organs of State, are being notified via Letter 4, of the 30-day comment and registration period within which to submit comments on the Draft EIA Reports and/or to register on the I&AP database.

- **Executive Summaries:** Executive summaries of the Draft EIA Reports are also being uploaded to the project website and alternative web-platforms**.**

- **Availability of Information:** As indicated above, the Draft EIA Reports are currently being made available for a 30-day comment period and distributed electronically to ensure access to information on the projects. The Draft EIA Reports are being 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 EIA Reports are also being uploaded to another alternative web-platform (i.e. Google Drive: https://bit.ly/GenesisBWestWEFs). If an I&AP cannot access the reports via the project website, via the alternative web-platforms such as Google Drive, and if additional information is required (other than what is provided in the Executive Summaries), then the I&AP can contact the EAP, who will then make an electronic copy available (where feasibly possible).

- **Reminder / Follow Up Emails of the Comment Period Closure:** Reminder / follow up emails will be sent to I&APs, stakeholders and Organs of State included on the project database, where email addresses are available, during the 30-day comment period on the Draft EIA Reports in order to seek comments. Proof of such correspondence will be included as an appendix to the Final EIA Report.

Note that the correspondence received from stakeholders since the submission of the FSRs to the DFFE for consideration, and prior to the release of the Draft EIA Reports for comment, are included in Appendix E Part 5 of this EIA Report. These comments have been captured and responded to in a Comments and Responses Report included in Appendix E Part 6 of this EIA Report. Also note that the DFFE correspondence indicating the acceptance of the FSRs are included in Appendix E Part 4 of this EIA Report.

4.6.7.2 Task 2 – Comments and Responses Report

A key component of the Scoping and EIA process is documenting and responding to the comments received from I&APs and the authorities. Copies of all written comments received during the review of the Draft EIA Reports will be compiled into a Comments and Responses Report for inclusion in an appendix to the Final EIA Reports that will be submitted to the DFFE for decision-making. The Comments and Responses Report will indicate the nature of the comment, as well as when and

who raised the comment. The comments received will be considered by the EIA team and appropriate responses provided by the relevant member of the EIA team, the Project Developer and/or specialists. The response provided will indicate how the comment received has been dealt with in the EIA Process and considered in the Final EIA Reports, the project design or EMPrs. Should the comment received fall beyond the scope of this EIA, clear reasoning will be provided.

4.6.7.3 Task 3 – Compilation of the Final EIA Reports for Submission to DFFE

Following the 30-day commenting period on the Draft EIA Reports and incorporation of the comments received into the reports, the Final EIA Reports will be submitted to the DFFE for decision-making in line with Regulation 23 (1) (a) of the 2014 NEMA EIA Regulations (as amended). The reports will be submitted electronically to the DFFE via the One-Drive System.

In line with best practice, I&APs on the project database will be notified via **Letter 5** via email (where email addresses are available) of the submission of the Final EIA Reports to the DFFE for decision-making. To ensure ongoing access to information, copies of the Final EIA Reports that have been submitted for decision-making and the Comments and Response Reports (detailing comments received during the EIA Phase and responses thereto) will be placed on the project website (i.e. https://www.csir.co.za/environmental-impact-assessment). As a supplementary mechanism, the Final EIA Reports will also be uploaded to another alternative web-platform (i.e. Google Drive).

The Final EIA Reports, which will be submitted for decision-making to the DFFE, will include proof of the PPP that was undertaken to inform Organs of State, Stakeholders and I&APs of the availability of the Draft EIA Reports for the 30-day comment period (as explained above).

The DFFE will have 107 days (from receipt of the Final EIA Reports) to either grant or refuse EA (in line with Regulation 24 (1) of the 2014 NEMA EIA Regulations, as amended). However, it is understood that decision-making for renewable energy applications is being reduced to 57 days, as best as possible.

4.6.7.4 Task 4 – Environmental Authorisation (EA) and Appeal Process

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 Project 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.

The notification 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 6** (Release of EAs and Notification of Opportunity to Appeal)) to be sent via email to all registered I&APs, Stakeholders and Organs of State on the project 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. 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).

4.7 Authority Consultation during the EIA Phase

Authority consultation is integrated into the PPP, with meetings or discussions held on online platforms with the lead authorities, where necessary. It is proposed that the Competent Authority (i.e., DFFE) as well as other lead authorities will be consulted at various stages during the EIA Process, if required. At this stage, the following authorities have been identified for the purpose of this EIA Process (additional authorities might be added to this list as the EIA Process progresses):

- Air Traffic Navigation Services (ATNS)
- AgriSA;
- Agri Western Cape;
- Agri Northern Cape;
- Beaufort West Local Municipality;
- Birdlife South Africa;
- Central Karoo District Municipality;
- DWS;
- DFFE Integrated Environmental Authorisations Directorate;
- DFFE Biodiversity and Conservation Directorate;
- DFFE Protected Areas Directorate;
- Endangered Wildlife Trust;
- Eskom SOC Ltd;
- Heritage Western Cape (HWC);
- Namakwa District Municipality;
- National Energy Regulator of South Africa (NERSA);
- Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (NC DAEARDLR)
- Northern Cape Heritage Resources Authority (NCHRA)
- Pixley ka Seme District Municipality;
- South African Civil Aviation Authority (SACAA);
- SAHRA;
- South African Local Government Association (SALGA);
- South African National Parks (SANParks);
- South African National Roads Authority (SANRAL);
- SARAO;
- South African Weather Services (SAWS);
- Ubuntu Local Municipality;
- VulPro;
- Western Cape Department of Environmental Affairs and Development Planning (DEA&DP)
- Western Cape Department of Infrastructure, Chief Directorate: Roads Planning
- Wildlife and Environmental Society of South Africa (WESSA); and
- World Wildlife Fund South Africa (WWF SA).

The authority consultation process for the EIA Phase is outlined in Table 4.6 below.

Table 4.6: Authority Communication Schedule.

STAGE IN EIA PHASE	FORM OF CONSULTATION
During preparation of EIA Reports	Communication (via email or online platforms (i.e. Microsoft Teams)) with the DFFE on the outcome of Specialist Studies, if required.
On submission of EIA Reports for comment	Online meetings with dedicated departments, if requested by the DFFE, with jurisdiction over particular aspects of the project (e.g. Local Authority).

4.8 Schedule for the Scoping and EIA Processes

The proposed schedule for the Scoping and EIA Processes based on the legislated EIA timeframes, is presented in Table 4.7. It should be noted that this schedule could be revised during the EIA Processes, depending on factors such as the time required for decisions from authorities.

Table 4.7: Provisional Schedule for the proposed project

Key Steps	Proposed Timeframe
Appointment of Specialists	December 2022 to January 2023
Project Initiation and Pre-Application Meeting with the Department of Forestry, Fisheries and the Environment (DFFE)	7 February 2023
Approval of Notes of the Pre-Application Meeting	28 February 2023
Specialist Inputs to the Draft Scoping Reports (DSRs)	March to August 2023
Release DSR for 30-day comment period	September to October 2023
Submit Final Scoping Reports (FSRs) to the DFFE for Consideration	October 2023
DFFE Accepted the FSRs	27 November 2023
Applications for EA lapsed	April 2024
Notification of the intended resubmission of the Applications for EA	September 2025
Prepare Draft EIA Reports	January to October 2025
Release Draft EIA Reports for the for 30-day comment period	October to November 2025
Submit Final EIA Reports to DFFE for Decision-Making	November 2025
DFFE Decision-Making on the Final EIA Report and issue of Decision (i.e. grant or refuse EA): 107 days [or reduced to 57 days]	November to March 2026 (57 day EA) or May 2026 (107 day EA)
EAP to Notify I&APs of Decisions (14 days)	14 days after EA is issued

4.9 Terms of Reference for the Specialist Assessments

The specialist studies / inputs / technical studies have been undertaken based on compliance with relevant legislation and based on the Terms of Reference indicated in the Plan of Study for the EIA, i.e. Chapter 7 of the FSR[20], which was accepted in November 2023.

The Terms of Reference for each study is discussed in this section and has also been included in the relevant specialist studies in Appendix G of this EIA Report. The Terms of Reference for the specialist studies / inputs / technical studies essentially consist of the generic assessment requirements and the specific issues identified for each discipline, as captured in the Plan of Study for EIA.

The assessment methodology for the specialist assessments, as recommended by the then Department of Environmental Affairs (DEA) 2006 Guideline on Assessment of Impacts, are included in Chapter 6 and Appendix G of this EIA Report.

4.9.1 Agricultural Compliance Statement

The Agricultural Compliance Statement is included in Appendix G.1 of this EIA Report, and it complies with the Agriculture Protocol that applies to all onshore wind and/or solar PV energy activities requiring EA that was published on 20 March 2020, in GG 43110, GN 320. The Agricultural Compliance Statement was completed based on the following Terms of Reference:

- Specification of development setbacks or buffers required (if any), and clear motivations for these recommendations;
- Provision of a map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the Screening Tool;
- Calculations of the physical development footprint area for each land parcel as well as the total physical development footprint area of the proposed development including supporting infrastructure;
- Confirmation that the development footprint is in line with the allowable development limits contained in GN 320;
- Identification of the direct, indirect and cumulative impacts associated with the proposed development, where possible, (although an assessment and rating of impacts is not strictly required for a Compliance Statement stipulated in GN 320):
- Identification of cumulative impacts by considering other renewable energy and EGI projects within 30 km of the proposed projects;
- Confirmation that all reasonable measures have been taken through micro-siting to avoid or minimise fragmentation and disturbance of agricultural activities;
- Inclusion of a substantiated statement indicating the level of acceptability of the proposed development and a recommendation if the development should go ahead or not; as well as any conditions to which this statement is subjected;
- Description of assumptions, any uncertainties or gaps in knowledge or data, and limitations;

[20] CSIR, 2023. Scoping and Environmental Impact Assessment (EIA) Process for the proposed development of the Genesis Eland Wind Energy Facility and associated infrastructure, near Beaufort West in the Western Cape Province. Scoping Report. CSIR Report Number: CSIR/SPLS/SE/ER/2023/1001/B+

- Confirm that the site is of “low” or “medium” sensitivity for agriculture; and indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must be applicable to the preferred site and proposed development footprint;
- Include a signed specialist statement of independence and details and relevant expertise as well as the South African Council for Natural Scientific Professions (SACNASP) registration number of the specialist, including a Curriculum Vitae;
- Where required, provide recommendations with regards to proposed impact management outcomes or any monitoring requirements for inclusion in the EMPrs;
- Determine mitigation and/or management measures for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts;
- Review the Generic EMPr for Substations and Power Lines (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPrs; and
- Incorporate and address relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

4.9.2 Terrestrial Biodiversity and Species Impact Assessment

The Terrestrial Biodiversity Specialist confirmed that the following are required during the EIA Phase:

- Terrestrial Biodiversity Specialist Assessment Report;
- Plant Species Compliance Statement; and
- Animal Species Specialist Assessment Report.

One combined report (included in Appendix G.2 of this EIA Report) has been compiled to address the Terrestrial Biodiversity, Terrestrial Plant Species and Terrestrial Animal Species Protocols stipulated below:

- Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Terrestrial Biodiversity (GG 43110 / GN 320, 20 March 2020);
- Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species (GG 43855 / GN 1150, 30 October 2020, as amended in July 2023 in GN 3717); and
- Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species (GG 43855 / GN 1150, 30 October 2020, as amended in July 2023 in GN 3717).

The Terrestrial Biodiversity and Animal Species Impact Assessments were completed based on the following Terms of Reference:

- Provide the contact details of the specialist, SACNASP registration number, field of expertise, relevant experience, and a Curriculum Vitae;
- Provide a signed statement of independence by the specialist;

- Liaison with the SANBI to obtain information on any sensitive species flagged in the Screening Tool (where species names are obscured / only numbered);
- Include a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;
- Provide a description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;
- Include a description of the terrestrial ecology and ecosystem features of the project site, with focus on features that are to be potentially impacted by the proposed project. The description will include the major habitat forms within the study area, giving due consideration to terrestrial biodiversity;
- Provide a motivation if there were development footprints that were identified as having a “low” terrestrial biodiversity sensitivity and that were not considered appropriate;
- Determination, description and mapping of the baseline environmental condition and sensitivity of the study area. Specification of development setbacks or buffers required, and clear motivations for these recommendations. Include a description of the extent of disturbance and transformation of the site;
- Provide review input on the preferred infrastructure layout following the sensitivity analysis and layout identification;
- Identification of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);
- Consideration of seasonal changes and long-term trends, such as due to climate change;
- Identification of any SCC or protected species found on site or those suspected to occur on site;
- The online database name, hyperlink and record accession numbers for disseminated evidence of SCC found within the study area;
- Assessment of local and regional biodiversity conservation planning relevant to the project area;
- Identification and assessment of the potential direct, indirect and cumulative impacts of the proposed developments on terrestrial biodiversity and species using the prescribed impact assessment methodology captured in Chapter 6 of the EIA Report. For cumulative impacts, consider other renewable energy and EGI projects within 30 km of the proposed projects. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;
- Provide a substantiated statement indicating the acceptability of the proposed development and a recommendation whether the development should go ahead or not; and any conditions to which this statement is subjected;
- Description of assumptions and limitations in the report and any uncertainties or gaps in knowledge or data;
- Provide a statement of the timing and intensity of site inspection observations (linked to GN 320);
- Include a description of the mean density of observations/number of sample sites per unit area of site inspection observations, where possible, as noted in the Species Environmental Assessment Guideline;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- Provision of recommendations with regards to potential monitoring programmes;

- Determine mitigation, impact management actions and outcomes for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts;
- Review the Generic EMPr for Substations and Power Lines (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPrs; and
- Incorporate and address relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

The Terrestrial Plant Species Compliance Statement is applicable to the study area and was completed based on the following Terms of Reference:

- Confirm that the study area, is of “low” sensitivity for terrestrial plant species; and indicate whether or not the proposed development will have any impact SCC;
- Provide contact details and relevant experience as well as the SACNASP registration number of the specialist, including a Curriculum Vitae;
- Provide a signed statement of independence by the specialist;
- Provide a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;
- Provide a description of the methodology used to undertake the site survey and to prepare the compliance statement, including equipment and modelling used where relevant;
- Provide the mean density of observations/number of samples sites per unit area, where possible, as noted in the Species Environmental Assessment Guideline;
- Where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPrs;
- Provide a description of the assumptions made and any uncertainties or gaps in knowledge or data;
- Provide any conditions to which the compliance statement is subjected; and
- Provide a motivation if there were any development footprints that were identified as having “low” or “medium” terrestrial plant species sensitivity and were not considered appropriate.

4.9.3 Aquatic Biodiversity and Species Impact Assessment

The Aquatic Biodiversity and Species Assessment is included in Appendix G.3 of this EIA Report, and it complies with the Aquatic Biodiversity Protocol that was published on 20 March 2020, in GG 43110, GN 320. The Aquatic Biodiversity and Species Assessment was completed based on the following Terms of Reference:

- Provide the contact details of the specialist, SACNASP registration number, field of expertise, relevant experience, and a Curriculum Vitae;
- Provide a signed statement of independence by the specialist;
- Provide a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;
- Provide a description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;

- Include a description of the aquatic biodiversity and ecosystems of the project site, with focus on features that are to be potentially impacted by the proposed project. The description should include the aquatic ecosystem types, presence of aquatic species, the major habitat forms giving due consideration to the composition of aquatic species communities, their habitat, distribution and movement patterns within the study area;
- Describe the extent of disturbance and transformation of the site, as necessary;
- Indication of the historic ecological condition (reference) and the Present Ecological State (PES) of identified aquatic features (in- stream, riparian and floodplain habitat), and on site that are to be potentially impacted by the proposed project i.e. possible changes to the channel and flow regime (surface and groundwater); and comment on the recommended ecological condition of aquatic habitats to be achieved within the project area;
- Include a map (if possible) describing the ecosystem processes that operate in relation to the aquatic ecosystems on and immediately adjacent to the project site (e.g. movement of surface and subsurface water, recharge, discharge, sediment transport, etc.);
- Identify and delineate wetlands that may occur on the sites, using the relevant protocols established;
- Provide an indication of the national and provincial priority status of the aquatic ecosystem, including a description of the criteria for the given status (i.e. if the site includes a wetland or a river freshwater ecosystem priority area or sub catchment, a strategic water source area, whether or not they are free-flowing rivers, wetland clusters, a critical biodiversity or ecologically sensitive area);
- Consideration of seasonal changes and long-term trends, such as due to climate change;
- Identify any SCC or protected species on site;
- Compilation of a Risk Matrix and determining whether an application for Water Use Authorisation (e.g. General Authorisation or Water Use License) is required and if so, determining the requirements thereof;
- Assessment of local and regional biodiversity conservation planning relevant to the project area;
- Provide a motivation if there were development footprints that were identified as having a “low” aquatic biodiversity sensitivity and that were not considered appropriate;
- Provide review input on the preferred infrastructure layout following the sensitivity analysis and layout identification;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- Determination, description and mapping of the baseline environmental condition and sensitivity of the study area. Specification of development setbacks or suitable construction and operational buffers for the aquatic ecosystem, using the accepted methodologies, and clear motivations for these recommendations including a description of the location of areas not suitable for development and to be avoided during construction and operation, where relevant;
- Provide a section indicating how the Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Provide the threat status of the ecosystem and species as identified by the Screening Tool;
- Identification and assessment of the potential direct, indirect and cumulative impacts of the proposed developments on aquatic biodiversity and species using the prescribed impact assessment methodology captured in Chapter 6 of the EIA Report. For cumulative impacts, consider other renewable energy and EGI projects within 30 km of the proposed projects.

Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;
- Provide a substantiated statement indicating the acceptability of the proposed development and a recommendation if the development should receive approval or not; and any conditions to which this statement is subjected;
- Include a description of assumptions and limitations in the report and any uncertainties or gaps in knowledge or data;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Provision of recommendations with regards to potential monitoring programmes;
- Determine mitigation, impact management actions and outcomes for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts;
- Review the Generic EMPr for Substations and Power Lines (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPrs; and
- Incorporate and address relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

4.9.4 Avifauna Impact Assessment

The Avifauna Assessment is included in Appendix G.4 of this EIA Report, and it complies with the Avifauna Protocol for wind energy developments that was published on 20 March 2020, in GG 43110, GN 320, as well as other relevant protocols and guidelines (such as the BLSA guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa). The Avifauna Assessment was completed based on the following Terms of Reference:

- Provide the contact details of the specialist, SACNASP registration number, field of expertise, relevant experience, and a Curriculum Vitae;
- Provide a signed statement of independence by the specialist;
- Provide a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;
- Include a description of the methodology used to undertake the SSV, impact assessment and site inspection, including equipment and modelling used where relevant;
- Include a description of the mean density of observations/number of sample sites per unit area of site inspection observations, where possible;
- Provide details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported;
- Finalisation of the findings and outcomes of the pre-construction avifaunal monitoring programme in accordance with the BLSA guideline for Wind Energy developments;
- Determination, description and mapping of the baseline environmental condition and sensitivity of the study area in terms of avifaunal features such as habitat use, roosting, feeding and nesting/breeding;

- Specification of development setbacks or buffers required, and provide clear motivations for these recommendations, including a description of the location of areas not suitable for development and to be avoided during construction and operation, where relevant;
- Provide review input on the preferred infrastructure layout following the sensitivity analysis and layout identification;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- Describe the affected environment from an avifaunal perspective, including consideration of the surrounding habitats and avifaunal features (e.g. Ramsar sites, Important Bird Areas, wetlands, migration routes, feeding, roosting and nesting areas, etc.);
- Describe and map bird habitats on the site, based on on-site monitoring, desk-top review, collation of available information, studies in the local area and previous experience. The assessment must also consider the maps generated by the Screening Tool;
- Identification and assessment of the potential direct, indirect and cumulative impacts of the proposed developments on avifauna using the prescribed impact assessment methodology captured in Chapter 6 of the EIA Report. For cumulative impacts, consider other renewable energy and EGI projects within 30 km of the proposed projects. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;
- Provide a reasoned opinion, based on the findings of the specialist assessment, indicating the acceptability of the proposed development and a recommendation whether the development should receive approval or not; and any conditions to which the opinion is subjected if relevant;
- Provide a description of the assumptions made, any uncertainties or gaps in knowledge or data, and limitations in the report;
- Include a section indicating how the Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Include recommendations for mitigation of impacts to acceptable levels (where possible) and potential monitoring programmes;
- Determine mitigation, impact management actions and outcomes for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts;
- Review the Generic EMPr for Substations and Power Lines (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPrs; and
- Incorporate and address relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

4.9.5 Visual Impact Assessment

The Visual Impact Assessment is included in Appendix G.5 of this EIA Report, and it complies with Part A of the Assessment Protocols that was published on 20 March 2020, in GG 43110, GN 320, as well as Appendix 6 of the 2014 NEMA EIA Regulations (as amended). The Visual Impact Assessment was completed based on the following Terms of Reference:

- Determination, description and mapping of the baseline environmental condition and sensitivity of the study area. Specify set-backs or buffers, and provide clear reasons for these recommendations;
- Provide a description of the visual character and visual absorption capacity of the local area. Identify and map any significant visual features or visual disturbances, as well as any sensitive visual receptors within the proposed project area or within viewsheds of the proposed project;
- Assessment of the preferred project layout following the SSV and layout identification;
- Viewshed for various elements of the proposed development must be calculated, defined and presented, and the varying sensitivities of these viewsheds must be highlighted;
- Mapping of visual sensitivity of the site taking into consideration visual receptors outside the site, and sensitivity to development on the site for potentially affected visual receptors of “very high” sensitivity;
- Provide review input on the preferred infrastructure layout following the sensitivity analysis and layout identification;
- Identification and assessment of the potential direct, indirect and cumulative impacts of the proposed development on the receiving environment from a visual perspective. For cumulative impacts, consider other renewable energy and EGI projects within 30 km of the proposed projects. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;
- Maps depicting viewsheds or line of sight across the sites should be generated and included. These maps must indicate current viewsheds/visual landscape/obstructions, as well as expected visual impacts during the construction, operational and decommissioning phases of the proposed project, as relevant;
- A reasoned opinion indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- Include a section indicating how the Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Provide a Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes;
- Determine mitigation, impact management actions and outcomes for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts;
- Review the Generic EMPr for Substations and Power Lines (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPrs; and

- Incorporate and address relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

4.9.6 Heritage Impact Assessment

The Heritage Impact Assessment is included in Appendix G.6 of this EIA Report, and it complies with Part A of the Assessment Protocols that was published on 20 March 2020, in GG 43110, GN 320, as well as Appendix 6 of the 2014 NEMA EIA Regulations (as amended). The Heritage Impact Assessment was completed based on the following Terms of Reference:

- Provide a description and assessment of the heritage features of the sites and surrounding area. This is to be based on desktop reviews, fieldwork, available databases and findings from other heritage studies in the area, where relevant. Reference to the grade of heritage feature and any heritage status the feature may have been awarded will be included (where possible);
- Specification of development setbacks or buffers required, and clear motivations for these recommendations;
- Map the heritage sensitivity for the study area, clearly showing any “no-go” areas in terms of heritage (i.e. “very high” sensitivity).
- Provide review input on the preferred infrastructure layout following the sensitivity analysis and layout identification;
- Identify and assess the potential direct, indirect and cumulative impacts of the proposed developments on the full scope of heritage features, including archaeology and the cultural-historical landscape, as required by heritage legislation, using the prescribed impact assessment methodology captured in Chapter 6 of the EIA Report. For cumulative impacts, consider other renewable energy and EGI projects within 30 km of the proposed projects. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;
- Liaison with the relevant authorities (i.e. SAHRA and HWC) in order to obtain a letter of approval, comments or a Permit in terms of the NHRA, including Regulations issued thereunder, as necessary. This also includes meeting the reporting requirements of SAHRA.
- A reasoned opinion indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- A section indicating how the Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- Inclusion of a Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes;
- Determine mitigation, impact management actions and outcomes for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts;
- Review the Generic EMPr for Substations and Power Lines (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any

resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPrs; and
- Incorporate and address relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

4.9.7 Palaeontology Assessment

The Palaeontology Impact Assessment is included in Appendix G.7 of this EIA Report, and it complies with Part A of the Assessment Protocols that was published on 20 March 2020, in GG 43110, GN 320, as well as Appendix 6 of the 2014 NEMA EIA Regulations (as amended). The Palaeontology Impact Assessment was completed based on the following Terms of Reference:

- Provide a description and assessment of the palaeontology of the sites and surrounding area. This is to be based on desktop reviews, fieldwork, available databases and findings from other palaeontology studies in the area, where relevant;
- Specification of development setbacks or buffers required, and clear motivations for these recommendations;
- Map the palaeontological sensitivity for the study area, clearly showing any “no-go” areas (i.e. “very high” sensitivity).
- Provide review input on the preferred infrastructure layout following the sensitivity analysis and layout identification;
- Identify and assess the potential direct, indirect and cumulative impacts of the proposed developments on palaeontology, using the prescribed impact assessment methodology captured in Chapter 6 of the EIA Report. For cumulative impacts, consider other renewable energy and EGI projects within 30 km of the proposed projects. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;
- A reasoned opinion indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- A section indicating how the Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- Inclusion of a Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes;
- Determine mitigation, impact management actions and outcomes for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts;
- Review the Generic EMPr for Substations and Power Lines (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPrs; and

- Incorporate and address relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

4.9.8 Socio-Economic Impact Assessment

The Socio-Economic Impact Assessment is included in Appendix G.8 of this EIA Report, and it complies with Part A of the Assessment Protocols that was published on 20 March 2020, in GG 43110, GN 320, as well as Appendix 6 of the 2014 NEMA EIA Regulations (as amended). The Socio-Economic Impact Assessment was completed based on the following Terms of Reference:

- Describe the socio-economic context of the study area, focusing on aspects that are potentially affected by the proposed project, and taking into consideration the current situation as well as the local trends, the local planning (Integrated Development Plans and Spatial Development Frameworks), and other developments in the area. The economic aspect of the assessment is anticipated to include aspects such as direct employment figures, feedback on the Gross Domestic Product (GDP) etc., and is not expected to require a detailed economic analysis;
- Identify the potential social and economic impacts (including benefits) associated with the proposed project, including *inter alia* impacts associated with loss of farmland (grazing), contribution to economic growth and job creation, training and skills development opportunities, quality of life, local community income and influx of workers / job seekers;
- Consider social issues such as potential in-migration of job seekers, opportunities offered by training and skills development, phasing of employment over the duration of the REIPPPP, cumulative effects with other REIPPPP projects in the local area, implications for local planning and resource use;
- Apply a variety of appropriate options for sourcing information, such as review of analogous studies, available databases and social indicators, use of interviews with key stakeholders such as local communities, local landowners and government officials (local and regional), etc., where possible, to inform the assessment. Undertake the collection of both primary and secondary data;
- Evaluate the implications of the social investment programme associated with REIPPPP projects on the local socio-economic context;
- Identify and assess the potential direct, indirect and cumulative impacts of the proposed development on the receiving environment from a socio-economic perspective using the prescribed impact assessment methodology captured in Chapter 6 of the EIA Report. For cumulative impacts, consider other renewable energy and EGI projects within 30 km of the proposed projects. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;
- A reasoned opinion indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- Identification of additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof, if any;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes; and
- Determine mitigation, impact management actions and outcomes for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and

enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts;
- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr; and
- Incorporate and address relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

4.9.9 Traffic Impact Assessment

The Traffic Impact Assessment is included in Appendix G.9 of this EIA Report, and it complies with Part A of the Assessment Protocols that was published on 20 March 2020, in GG 43110, GN 320, as well as Appendix 6 of the 2014 NEMA EIA Regulations (as amended). The Traffic Impact Assessment was completed based on the following Terms of Reference:

- Undertake a site visit to gather relevant information in terms of access, road conditions etc. and provide feedback following the site visit confirming if there are any aspects that need to be considered in the layout planning;
- Describe the traffic and transportation context of the study area, focusing on aspects that are potentially affected by the proposed project;
- Determine and describe the baseline transport and traffic condition of the study area;
- Consider traffic issues such as impact on the road network, congestion etc.;
- Description of the identified traffic features including the surrounding road network and potential traffic disturbances of the local area;
- Assessment of the preferred project layout and how it relates to traffic impact;
- Determine the national and local haulage routes between port of entry/manufacturer and site;
- Assessment of proposed internal roads and site access points;
- Assessment of freight requirements and permitting needed for abnormal loads;
- Identification and assessment of the potential direct, indirect and cumulative impacts of the proposed development on the receiving environment from a traffic perspective using the prescribed impact assessment methodology captured in Chapter 6 of the EIA Report. For cumulative impacts, consider other renewable energy and EGI projects within 30 km of the proposed projects. Impact significance must be rated both without and with mitigation, and must cover the relevant phases of the project;
- A description of assumptions and limitations in the report;
- A reasoned opinion indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes;
- Determine mitigation, impact management actions and outcomes for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts;

- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr.
- Incorporate and address relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

4.9.10 High Level Safety, Health, and Environment Risk Assessment for the Battery Energy Storage Systems

A High Level Safety, Health, and Environment Risk Assessment has been undertaken to study the risks associated with the proposed BESS. The Risk Assessment serves as a **technical report**, and thus Appendix 6 of the 2014 NEMA EIA Regulations (as amended) is **not** applicable.

The Risk Assessment for the BESS is included in Appendix G.10 of this EIA Report, and it was completed based on the following Terms of Reference:

- A description of the region and local features;
- A study of the battery technologies to be used;
- Identification of sensitive receptors in the area;
- Identification of the potential impacts on the health and safety of employees, contractors and public persons;
- Identification of relevant legislation and legal requirements; and
- Providing recommendations on possible preventative and mitigation measures for inclusion in the EMPr.

4.9.11 Desktop Geotechnical Assessment

The Desktop Geotechnical Assessment is included in Appendix G.11 of this EIA Report, and it complies with Part A of the Assessment Protocols that was published on 20 March 2020, in GG 43110, GN 320, as well as Appendix 6 of the 2014 NEMA EIA Regulations (as amended). The Desktop Geotechnical Assessment was completed based on the following Terms of Reference:

- Determine whether problem soils are likely to be encountered within the study area;
- Describe the geology and anticipated soil conditions;
- Include a general discussion of possible and likely engineering characteristics of the respective geological materials;
- Identify possible development constraints that may be present across the study area, e.g., topographical constraints, major discontinuities, or shallow groundwater conditions (permanent or non-permanent);
- Evaluation of the seismic potential of the area based on available published literature;
- Provide commentary on any potentially sensitive areas across the study area, such as ridges, outcrops and exposures.
- Provide broad recommendations that may be used to guide the geotechnical design and plan future investigations within the study area;
- Specification of set-backs or buffers, and provide clear reasons for these recommendations;
- Provide review input on the preferred infrastructure layout following the sensitivity analysis and layout identification;

- Identify and assess the potential direct, indirect and cumulative impacts of the proposed development on the receiving environment from a geotechnical perspective using the prescribed impact assessment methodology captured in Chapter 6 of the EIA Report. For cumulative impacts, consider other renewable energy and EGI projects within 30 km of the proposed projects. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;
- A reasoned opinion indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- Identification of additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof, if any;
- Include a Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes;
- Determine mitigation, impact management actions and outcomes for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts;
- Review the Generic EMPr for Substations and Power Lines (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPrs; and
- Incorporate and address relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

4.9.12 Bat Impact Assessment

The Bat Impact Assessment is included in Appendix G.12 of this EIA Report, and it complies with Part A of the Assessment Protocols that was published on 20 March 2020, in GG 43110, GN 320, as well as Appendix 6 of the 2014 NEMA EIA Regulations (as amended), and the South African Best Practice Guidelines for Pre-construction Monitoring of Bats at Wind Energy Facilities. The Bat Impact Assessment was completed based on the following Terms of Reference:

- Description of the affected environment from a bat perspective, including consideration of the surrounding habitats and bat habitat/foraging features (e.g., caves, ridges, crevices, migration routes, feeding, roosting & nesting areas, etc.);
- Assessment of the preferred project layout following the SSV and layout identification;
- Specification of development setbacks or buffers required, and provide clear motivations for these recommendations;
- Identification of any SCC or protected species on site;
- Identification of the potential direct, indirect and cumulative impacts of the proposed development on bats, including impacts that may be seasonal or diurnal, or linked to specific species and their feeding, roosting or nesting habitats and habits; using the prescribed impact assessment methodology captured in Chapter 6 of the EIA Report. For cumulative impacts, consider other renewable energy and EGI projects within 30 km of the proposed projects. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;

- Assessment of and recommendations for definite measurements for the preferred hub height and rotor diameter of the wind turbines;
- An impact statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- A section indicating how the National Web-Based Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provision of recommendations with regards to potential monitoring programmes;
- Determine mitigation, impact management actions and outcomes for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts;
- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr; and
- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

4.9.13 Noise Impact Assessment

The Noise Impact Assessment is included in Appendix G.13 of this EIA Report, and it complies with the Noise Protocol that was published on 20 March 2020, in GG 43110, GN 320. The Noise Impact Assessment was completed based on the following Terms of Reference:

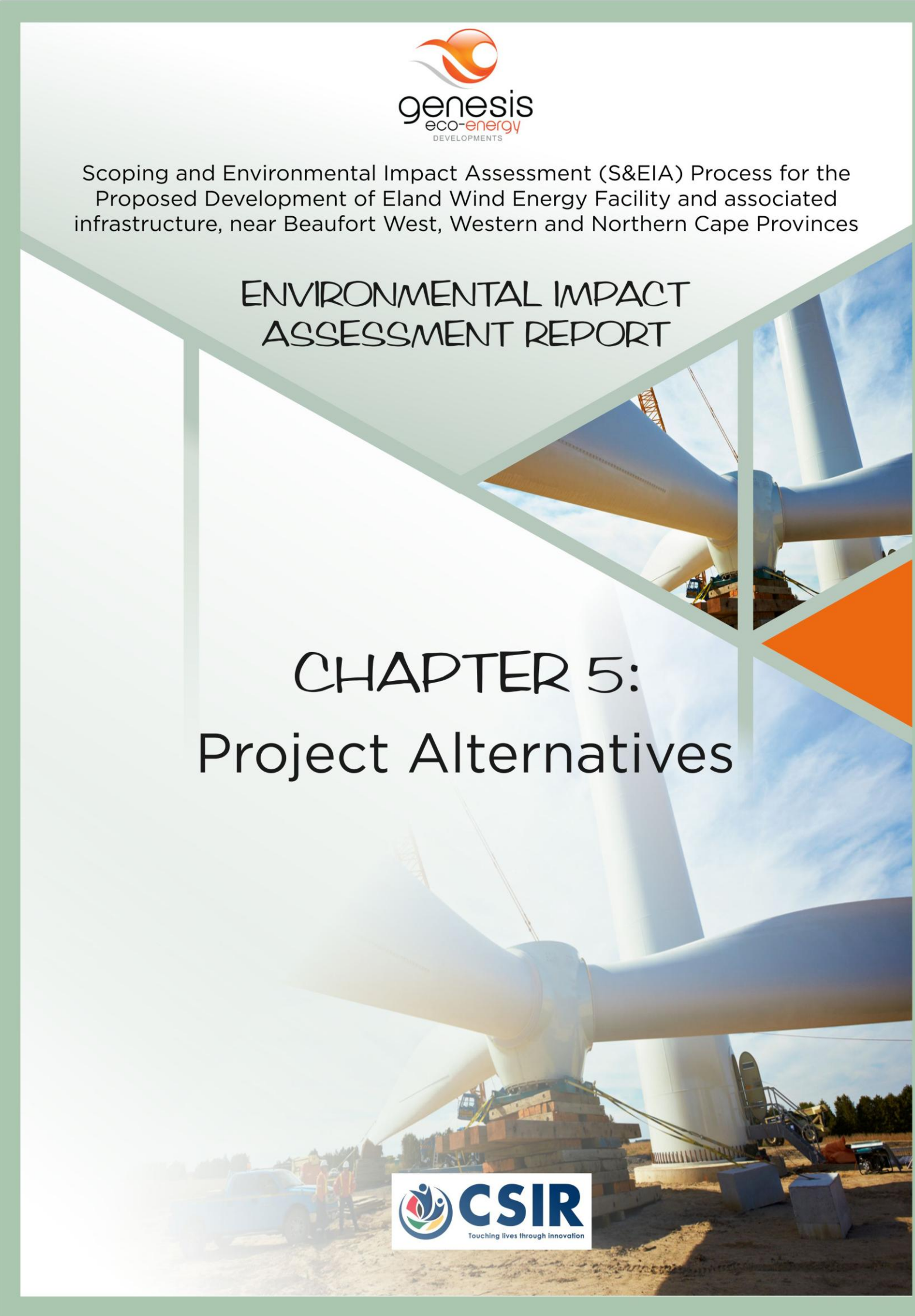
- Provide an indication of the duration and date of the site inspection and the relevance of the season and weather conditions to the outcome of the assessment;
- Provide a description of the methodology used to undertake the on-site assessment inclusive of the equipment and models used, as relevant, together with results of the noise assessment;
- Description and assessment of the noise sensitive receptors located within as well as in the vicinity of the project area that are likely to be impacted by the proposed development;
- Provide a map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope;
- Specification of development setbacks or buffers required, and provide clear motivations for these recommendations;
- Identification and assessment of the potential direct, indirect and cumulative impacts of the proposed developments using the prescribed impact assessment methodology captured in Chapter 6 of the EIA Report. For cumulative impacts, consider other renewable energy and EGI projects within 30 km of the proposed projects. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;

- Provide an impact a substantiated statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not and any conditions to which this statement is subjected;
- Include a description of assumptions, limitations and/or any uncertainties or gaps in knowledge in the report;
- Include a section indicating how the National Web-Based Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- Include a statement to confirm that all reasonable measures have been considered, or not, in the micro-siting of the proposed development to minimise disturbance of receptors;
- Include a Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes;
- Determine mitigation, impact management actions and outcomes for inclusion in the EMPrs, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts;
- Review of the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr; and
- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.

Scoping and Environmental Impact Assessment (S&EIA) Process for the Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 5: Project Alternatives



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5. APPROACH TO THE ASSESSMENT OF ALTERNATIVES

This chapter discusses the alternatives that have been considered as part of the Environmental Impact Assessment (EIA) Phase, as well as the selection process of the preferred alternatives that have been assessed for the proposed project.

Sections 24 (4) (b) (i) and 24 (4A) of the National Environmental Management Act (Act 107 of 1998, as amended) (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 Environmental Authorisation (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*".

The 2014 NEMA EIA Regulations (as amended) define "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; and*
- *includes the option of not implementing the activity".*

Appendix 3 of the 2014 NEMA EIA Regulations (as amended) provides the following objectives, *inter alia*, of the EIA Process in relation to alternatives:

- To identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment; and
- To identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment.

The EIA Report is therefore required to provide a full description of the process followed to reach the proposed preferred activity, technology, site and location of the development footprint within the site, including details of all the alternatives considered and the outcome of the site selection matrix. The details presented in this chapter applies to the proposed **Genesis Eland Wind Energy Facility** (WEF) (hereafter referred to as the "proposed project").

5.1 Assessment of Alternatives

5.1.1 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 project and associated infrastructure. This alternative would result in no environmental impacts on the site or surrounding local area as a result of the proposed project. It provides the baseline against which other alternatives are compared. 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 generated or supplied through means of renewable energy resources by the proposed 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 (CSP)) (Integrated Resource Plan (IRP), 2019);
- Electricity generation will remain constant (i.e. no renewable energy generation will occur on the site) and as a result, the local economy in terms of surrounding communities and towns within the local municipality 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 proposed 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;
- The local economic benefits associated with the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) will not be realised, and socio-economic contribution payments into the local community fiscus will not be realised;
- The development of WEFs instead of coal fired power stations can directly contribute to South Africa's response to climate mitigation; and
- Wind and solar energy are the cheapest source of electricity in South Africa. The development of the proposed project can contribute to the competitive nature of the REIPPPP to drive prices down even further to ensure that South Africans have access to affordable yet clean electricity.

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

- Only the agricultural land use (livestock farming/grazing) will remain;
- No vegetation or protected species (flora) will be removed or disturbed during the development of the proposed project;
- No aquatic resources will be impacted upon during the construction and operation of the proposed project;
- No destruction of habitat will occur;
- No change to the current landscape will occur (i.e. the visual character of the area will remain unchanged);
- No heritage features will be impacted on;
- No noise impacts associated with construction activities will occur;

- No avifaunal impacts will occur due to the establishment of the proposed project;
- No additional traffic will be generated; and
- No additional water use will be required.

The no-go alternative has been considered by the specialists in the EIA Phase. Refer to Appendix G of this EIA Report for the Specialist Studies and Inputs, that include feedback on the no-go alternative, where relevant. **It is important to note that none of the Specialist Studies and Inputs have identified any environmental fatal flaws, and no unacceptable impacts after the implementation of mitigation measures have been identified.**

The no-go alternative means no addition of renewable energy and transmission infrastructure, which means 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 project 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, nor is it a reasonable and feasible alternative to be considered in this EIA Process**.

5.1.2 Land-Use Alternatives

According to the Agricultural Compliance Statement (Appendix G.1 of this EIA Report), the arid climate is the limiting factor for land capability, regardless of the soil and terrain capability. Moisture availability is insufficient for crop production without irrigation, and the potential agricultural land use of the study area is therefore limited to low carrying capacity grazing. The farm portions forming part of the study area are located in a sheep and cattle farming region. The grazing capacity of the study area is fairly low at 28 hectares (ha) per large stock unit.

The Agricultural Site Sensitivity Verification (Appendix G.1 of this EIA Report) verifies that the proposed site is classified as low to medium agricultural sensitivity with a predominant land capability value of 4 to 6 (with 15 being the highest), which is in line with the climate limitations that make the site unsuitable for crop production. The development footprint of the proposed WEF will be well within the allowable development limit on land of low and medium agricultural sensitivity. Note that infrastructure components avoid croplands, including access roads, which circumvent the croplands.

The Agricultural Site Sensitivity Verification (Appendix G.1 of this EIA Report) for the proposed 132 kV overhead power line (OHPL) corridor confirms that the agricultural sensitivity of the power line corridor is largely negligible as the development of the power line has insignificant agricultural impact. All agricultural activities that are viable in this environment, can continue completely unhindered underneath the power line and there will therefore be negligible loss of agricultural production potential.

Additionally, there is no scarcity of such agricultural land in South Africa and its conservation for agricultural production is therefore not a priority. The proposed project offers positive impact on agriculture by way of improved financial security for farming operations, as well as security benefits against stock theft and other crime.

Hence, the existing agricultural land use is not a preferred alternative, and is not deemed as feasible for consideration in the EIA Phase, based on the motivation provided above.

5.1.3 Type of Activity Alternatives

In terms of the type of activity, this relates to the generation of electricity from a renewable energy source, and in this particular case, from **wind** resources. As indicated in Chapter 1 of this EIA Report, the Project Developer, Genesis Eco-Energy Developments (Pty) Ltd (GEED), focuses on solar, wind and hybrid renewable energy developments and works with landowners, technology providers, regulators and investors to source and develop renewable energy projects. Therefore, the **generation of electricity from a renewable energy source** was the only activity considered by the Project Developer and Project Applicant and thus considered in this Scoping and EIA Process. **No other activity types were considered or deemed appropriate based on the expertise of the Project Applicant**.

5.1.4 Renewable Energy Alternatives

Where the “activity” is the generation of electricity from a renewable energy source, possible alternatives that could potentially be considered include Biomass, Hydro Energy, Solar Energy and Wind Energy. The study area is attractive for renewable energy facilities (REFs) due to the significant solar and wind energy resources. As a result, the Project Developer is investigating and is proposing both solar and wind energy facilities as part of its package of projects in the area, consisting of two Solar Energy Facilities (SEFs) and numerous WEFs. Biomass and Hydro energy facilities are deemed to be unsuitable technologies in the study area, and potential impacts of each, are discussed below.

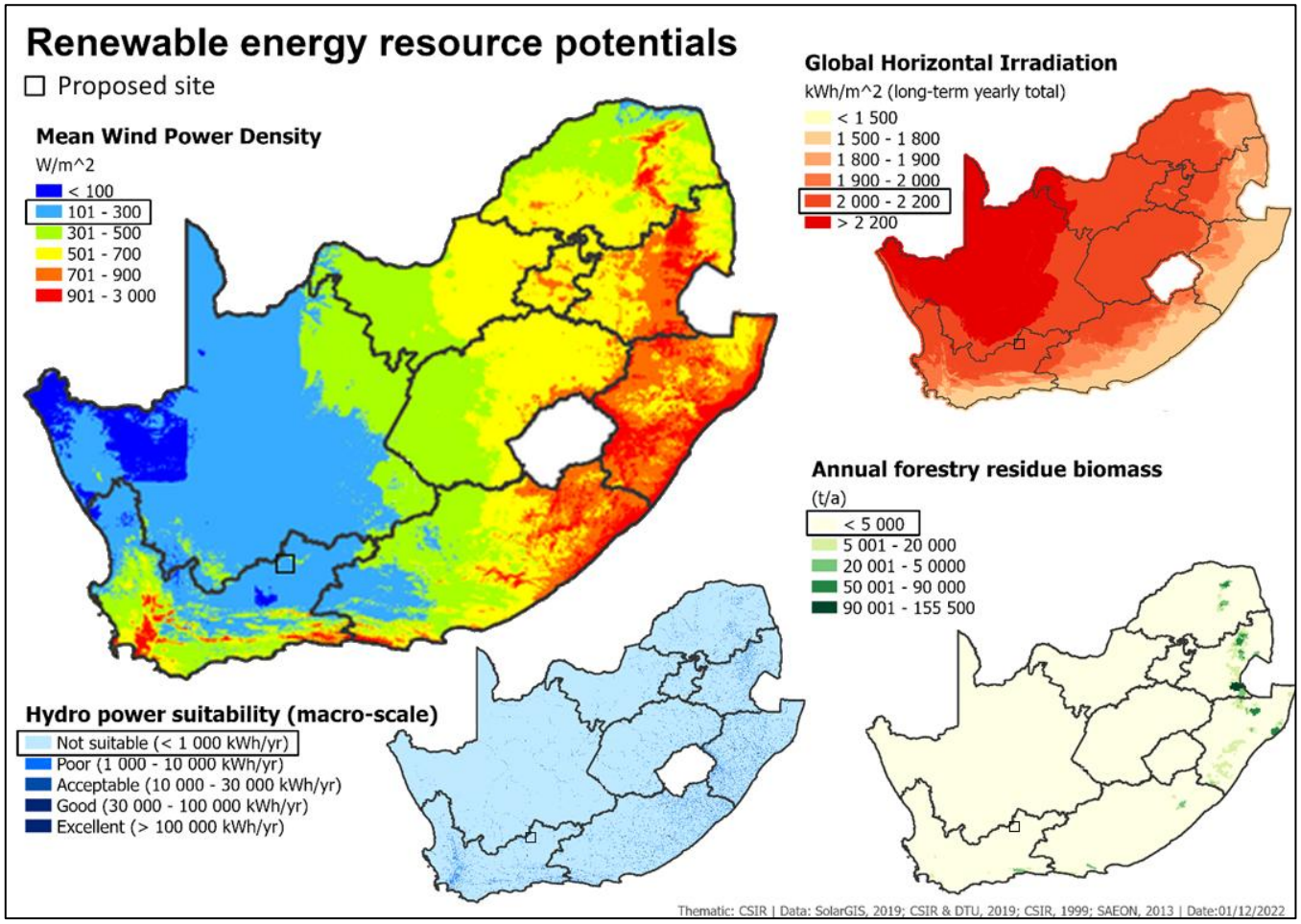

Figure 5.1: Solar Resource Availability / Global Horizontal Irradiation (kWh/m2); Annual Mean Wind Power Density (W/m2); Hydropower Potential (kWh/year); and Biomass Potential in terms of Annual Forestry Residue (t/a) for South Africa. The proposed project location is indicated by the black square.

5.1.4.1 Biomass Energy

The proposed project study area does not contain an abundant or sustainable supply of biomass. As indicated in Figure 5.1, the proposed project study area has less than 5 000 t/a annual forestry residue biomass, which is the lowest for this category. Therefore, the study area does not have any biomass energy potential.

Therefore, the implementation of a Biomass Energy Facility within the study area is not considered to be a reasonable and feasible alternative to be assessed as part of this Scoping and EIA Process.

5.1.4.2 Hydro Energy

The proposed project study area does not contain any large inland water bodies, which excludes the possibility of renewable energy from small- or large-scale hydro energy generation. In terms of macroscale hydropower potential (Figure 5.1), the study area falls within an area classified as "Not Suitable" (i.e. less than 1 000 kWh/year).

Therefore, the implementation of a Hydro Energy Facility within the study area is not considered to be a reasonable and feasible alternative to be assessed as part of this Scoping and EIA Process.

5.1.4.3 Wind and Solar Energy

5.1.4.3.1 National Planning: IRP 2019[1]

The 2019 IRP was published in Government Gazette (GG) 42784, Government Notice (GN) 1360 on 18 October 2019 for the period 2019 to 2030. As indicated in Figure 5.2 for the projection to 2030, coal makes up approximately 43% of the total installed capacity, whereas Wind and Solar PV respectively make up 23% and 10% (Table 5, Page 42 of the IRP 2019 published in GG 42784).

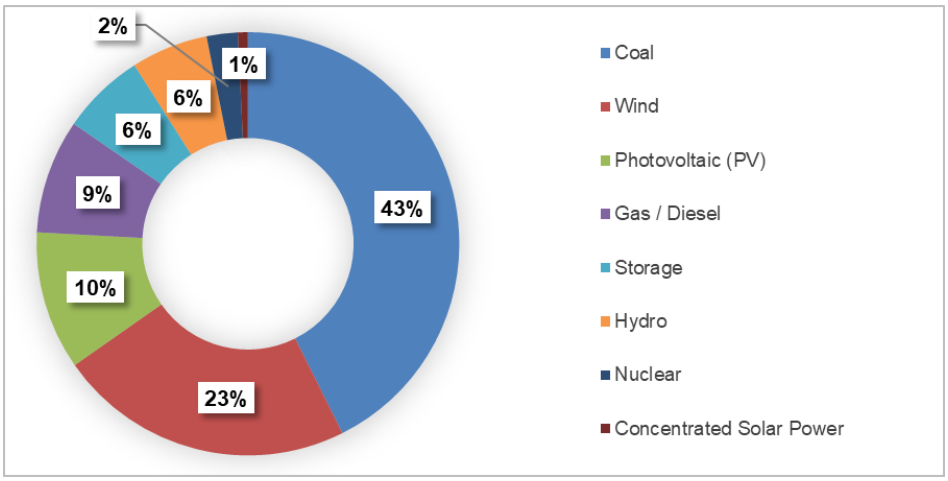

Figure 5.2: Total Installed Capacity for 2030 (% of MW) in the IRP of 2019.

[1] The IRP was updated in 2023 (2023 Draft IRP) and released for public comment in January 2024. It has not been gazetted for implementation yet.

The 2019 IRP proposes to secure 26 630 MW of renewable energy capacity by 2030 (for Wind, Solar PV and CSP). This amount excludes Hydropower and Storage. Of this total, 1 474 MW of Solar PV, 1 980 MW of Wind and 300 MW of CSP is already installed capacity. In addition, of the 26 630 MW, approximately 814 MW of Solar PV, 1 362 of Wind and 300 MW of CSP is committed or already contracted capacity. Furthermore, of the 26 630 MW total, 6 000 MW is allocated to Solar PV, and 14 400 MW is allocated to Wind as new additional capacity. Refer to Figure 5.3 for additional information.

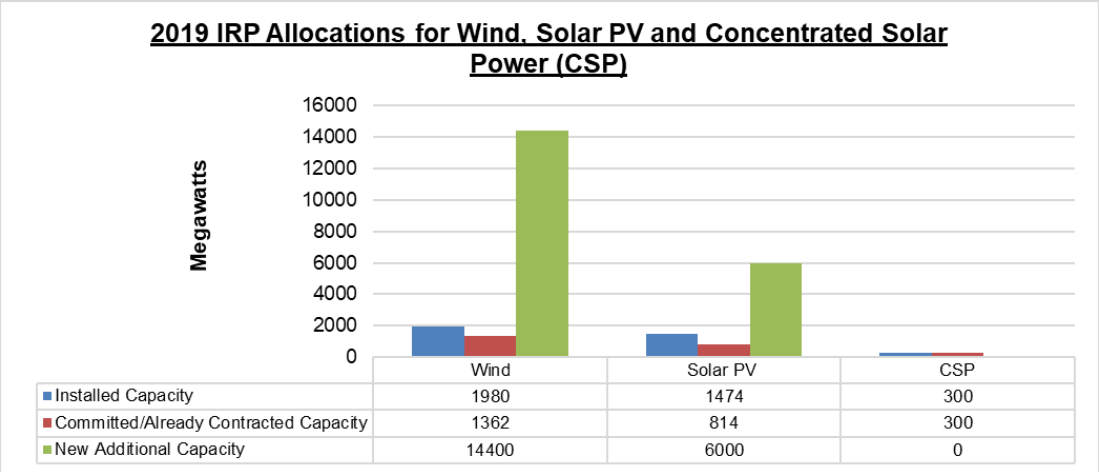

Figure 5.3: 2019 IRP Allocations for Wind, Solar and CSP in MW.

As part of the rollout of renewable energy in the country, the then Department of Mineral Resources and Energy (DMRE) developed a bidding process for the procurement of a set amount (MW) of renewable energy in accordance with the IRP from Independent Power Producers (IPPs). The REIPPPP was launched in 2011 to implement the vision of the IRP, and it included several bidding rounds (called "Bidding Windows"). To date, Bidding Windows 1, 2, 3, 3.5, 4, 5, 6 and 7 have been announced.

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 GN 733, GG 39111. Of this, the additional target allocated for solar PV was 2 200 MW and the additional target allocated for onshore wind was 3 040 MW.

On 28 October 2021, the Minister of Mineral Resources and Energy (DMRE, 2021a[2]) announced the Preferred Bidders of Bid Window 5 of the REIPPPP, which was released in April 2021. The aim was to procure a total of 2 600 MW (consisting of 1 600 MW from onshore wind and 1 000 MW from Solar PV). Approximately 102 Bids were submitted in August 2021. 25 Preferred Bidder Projects, totalling 2 583 MW, were selected (DMRE, 2021a[1]). Of the 2 583 MW, approximately 1 608 MW and 975 MW will be respectively procured from 12 wind projects and 13 Solar PV projects

[2] DMRE (2021a). Announcement by the Minister of Mineral Resources and Energy, the Honourable Gwede Mantashe 28 October 2021 Renewable Energy IPP Procurement Programme (REIPPPP) Bid Window 5 Announcement of Preferred Bidders. https://ipp-projects.co.za/PressCentre [online]. Accessed November 2021.

(DMRE, 2022a[3]). In Bid Window 5, the preferred bidders provided an average tariff of 50 c/kWh for wind and of 43 c/kWh for solar PV. In Bid Window 6, the 5 Preferred Bidders, totalling 860 MW of solar PV, provided an average tariff of 49 c/kWh for solar PV (DMRE, 2022b[4]). This is a considerable reduction in tariff from Bid Window 4 in November 2015 where the tariff provided for wind and solar PV were both 78 c/kWh. This confirms the crucial role that renewable energy is playing in being the lowest cost energy alternative in South Africa, while supporting the decarbonisation of the power system and ensuring that electricity is cost-effective and sustainable.

According to the IPP Office, in a presentation made at the Bid Window 6 Bidders' Conference on 7 July 2022 (IPP Office, 2022b[5]), as of March 2022 (excluding Bid Window 5 statistics), the DMRE had selected 92 Preferred Bidders, with a total combined electricity capacity of 6 323 MW procured, of which 5 826 MW is already operational from 87 IPPs. Based on a media statement dated 30 April 2024, at the time, the REIPPPP had 95 IPP projects supplying 7 336 MW to the national grid (including from renewable and diesel generators) (DMRE, 2024a[6]).

Bid Window 6 was announced in April 2022 and closed on 03 October 2022 and aims to procure 4 200 MW (i.e. 3 200 MW from wind and 1 000 MW from Solar PV). Six Preferred Bidders for Solar PV projects have been announced for Bid Window 6. It is understood that two of the six preferred bidders reached Commercial Close on 30 April 2024 (DMRE, 2024a).

Bid Window 7 was announced in December 2023 and closed on 15 August 2024. It aims to procure 5 000 MW (i.e. 3 200 MW from wind and 1 800 MW from Solar PV). Eight preferred bidders for Solar PV projects have been announced for Bid Window 7. The 8 Preferred Bidders, totalling 1 760 MW of solar PV, provided an average tariff of 46 c/kWh for solar PV (South African Government, 2024)[7]. In July 2025, an additional six solar PV projects, totalling 1 290 MW, were allocated as preferred bidders in Bid Window 7. This involved a re-allocation of the MW from onshore wind to solar PV in this Bid Window (Department of Electricity and Energy, 2025[8]).

On 7 July 2020, in GG 43509, GN R753, the Minister of Mineral Resources and Energy, in consultation with the National Energy Regulator of South Africa (NERSA), determined that new generation capacity needs to be procured to contribute towards energy security. Specifically, the gazette noted that 2000 MW needs to be procured from a range of energy source technologies in

[3] DMRE (2022a). Media Statement by the DMRE: Signing of an additional three project agreements under the 5th Bid Window of the Renewable Energy Independent Power Producer Programme (REIPPPP BID WINDOW 5), dated 10 November 2022. https://ipp-projects.co.za/PressCentre [online]. Accessed November 2022.

[4] DMRE (2022b). Media Statement by the DMRE: Signing of Preferred Bidder projects under the 5 the Bid Window, and announcement of Preferred Bidders under the 6th Bid Window of the REIPPPP, dated 8 December 2022. https://www.energy.gov.za/files/media/pr/2022/MediaStatement-REIPPPP-BW5-signing-08122022.pdf [online]. Accessed February 2023.

[5] IPP Office (2022b). Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) Bid Window 6 Bidders' Conference dated 7 July 2022. https://ipp-projects.co.za/PressCentre [online]. Accessed August 2022.

[6] DMRE (2024a). Media Statement: First two projects reach Commercial Close under the 6th Bid Window of the REIPPPP (30 April 2024). https://www.ipp-renewables.co.za/ [online]. Accessed July 2024.

[7] South African Government (2024). Minister Kgosientsho Ramokgopa on 8 Preferred Bidders under Renewable Energy Independent Power Producer Procurement Programme and 8 Preferred Bidders under Battery Energy Storage Independent Power Producer Procurement P. [Online]. Available at: https://www.gov.za/news/media-statements/minister-kgosientsho-ramokgopa-8-preferred-bidders-under-renewable-energy [Accessed: September 2025].

[8] Department of Electricity and Energy (2025). REIPPPP Bid Window 7 List of Successful Bidders [Online]. Available at: https://www.ipp-projects.co.za/ [Accessed: September 2025].

accordance with the short-term risk mitigation capacity allocated for the years 2019 to 2022 (under "other" in the allocation table contained in 2019 IRP). In line with this, the Risk Mitigation IPP Procurement Programme (RMIPPPP) was designed and launched in August 2020 by the DMRE in order to fulfil the GN R753 Ministerial Determination. Bids were submitted by various IPPs on 22 December 2020, and on 18 March 2021, the Minister of Mineral Resources and Energy, announced eight Preferred Bidders selected under the RMIPPPP, totalling 1 845 MW (DMRE, 2021b[9]). Three additional Preferred Bidder projects were also announced on 1 June 2021 under the RMIPPPP with a combined capacity of 150 MW, resulting in a total of approximately 1 995 MW to be procured under the RMIPPPP (DMRE, 2021c[10]).

As indicated in Chapter 1 of this EIA Report, the proposed project forms part of a package of 2 SEFs and numerous WEFs. **It is intended for these proposed projects to be bid under future rounds of the REIPPPP or similar public or private electricity procurement processes, following the issuing of Environmental Authorisations (EAs), should such authorisations be granted.**

5.1.4.3.2 Solar Energy

In terms of the suitability of solar energy development at this location, the proposed project study area falls within the **second highest** Global Horizontal Irradiation[11] (GHI) category, relevant to PV installations (Figure 5.1). As indicated in Figure 5.1, the study area has a GHI of 2 000 kWh/m^2 to 2 200 kWh/m^2 in terms of the long-term yearly total.

Therefore, this area is deemed as one of the most suitable for the construction and operation of solar energy facilities as opposed to other areas and provinces within South Africa. For example, coastal regions within the Eastern Cape and Western Cape mainly have a lower GHI (shown in the lighter orange shades in Figure 5.1), which is not completely feasible as site alternatives for the proposed project. As indicated in the earlier discussion on the outcomes of Bid Window 5, Bid Window 6, and Bid Window 7 in October 2021, December 2022, and December 2024, respectively, solar PV is currently the least cost energy generation option for South Africa. These factors substantiate that the use of solar resources in the area is extremely viable and support the development of Solar PV within the proposed project study area.

Solar energy development is therefore a feasible alternative for the proposed site. However, as described in Chapter 1 of this EIA Report, the proposed project forms part of a **hybrid energy system cluster** that is currently being proposed by the Project Developer. This hybrid energy system cluster comprises wind and solar energy facilities which will complement one another, and it will harness both the favourable wind and solar energy resources characterising the study area. It is important to re-iterate that even though wind and solar PV projects are being proposed as part of the larger development, each wind and solar PV project forming part of the GEED Beaufort West

[9] DMRE (2021b). Media Statement: To Announce Preferred Bidders for the Risk Mitigation IPP Procurement Programme (RMIPPPP). https://www.dmr.gov.za/news-room/post/1894/media-statement-to-announce-preferred-bidders-for-the-risk-mitigation-ipp-procurement-programme-rmipppp [online]. Accessed November 2021.

[10] DMRE (2021c). Media Statement: Department of Mineral Resources and Energy Announces Three Additional Preferred Bidders Appointed under the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP). https://www.ipp-rm.co.za/ [online]. Accessed November 2021.

[11] Global Horizontal Irradiance is the total amount of shortwave radiation received from above by a surface horizontal to the ground.

Renewable Energy Cluster, are being subjected to separate Applications for EA (no combined applications for hybrid renewable energy applications have been submitted). This current EA Application is for the proposed Eland WEF.

5.1.4.3.3 Wind Energy

In order to ensure that a WEF is successful, a reliable wind resource is required. Wind resource is defined in terms of average wind speed and includes Weibull distribution (used to describe wind speed distributions); turbulence, wind direction, and pattern of wind direction (as depicted by a wind rose). These factors are all key considerations used in determining whether a site is suitable for the development of a WEF. A mean wind power density map has been created (CSIR, 2018), which is not related to any specific turbine type and demonstrates the wind resource of the country. The mean wind power density map shows that the project study area falls within an area of approximately 101 – 300 W/m^2 (Figure 5.1).

On-site wind measuring meteorological (met) masts have been installed on site to provide wind- and meteorological measurements in order to verify the presence of the wind resource. The process of collecting on-site wind data is necessary to confirm both the presence of the wind resource on-site and the bankable viability of the proposed project. The provision of at least 12 months' on-site wind monitoring data is also a requirement of the REIPPPP. Data received from consistent measurements for a year indicated that the wind resource at the proposed project site is more than adequate for the development of a WEF.

Wind energy development is therefore a feasible alternative for the proposed site. Therefore, for this proposed Eland WEF as part of the current EA Application, the most feasible and preferred renewable energy alternative is wind energy.

5.1.4.4 Summary of the Renewable Energy Alternatives

Table 5.1 presents a summary and an evaluation matrix for the possible renewable energy alternatives with regards to resource suitability and availability, and potential risks and impacts.

Table 5.1: Summary of Evaluation of Potential Risks and Impacts for Renewable Energy Alternatives

Type of Renewable Energy Alternative	Are suitable resources available at the proposed project site?	Main Potential Impacts and Risks	Is this the preferred Alternative?
Biomass Energy	▪ No – not suitable i.e. less than 5 000 t/a annual forestry residue biomass.	▪ Significant Waste Generation with the potential need for a Waste Management Licence; and ▪ Air Emissions with the potential need for an Atmospheric Emissions Licence.	▪ No
Hydro Energy	▪ No – "Not Suitable" (i.e. less than 1 000 kWh/year)	▪ Significant impacts on aquatic biodiversity and hydrology of the affected river system; ▪ Water Use Licence would be required for the establishment of an in-stream hydropower development; and	▪ No

Type of Renewable Energy Alternative	Are suitable resources available at the proposed project site?	Main Potential Impacts and Risks	Is this the preferred Alternative?
		▪ Long lead times would be required for the various permits needed for such a development.	
Solar Energy	▪ Yes – 2 000 - 2 200 kWh/m^2. Forms part of the hybrid (PV and Wind) energy cluster proposed by the Project Developer. However, the current EA Application is for the Eland WEF.	▪ Visual impacts as a result of construction activities and the PV panels during operation; ▪ Noise generation as a result of construction activities; ▪ Loss of agricultural land (i.e. grazing); ▪ Impacts on heritage resources (i.e. archaeology and palaeontology); ▪ Impacts on the water balance as a result of water required for panel cleaning; and ▪ Impacts on avifauna, aquatic ecology and terrestrial ecology.	▪ No (But forms part of the hybrid (PV and Wind) energy cluster proposed by the Project Developer)
Wind Energy	▪ Yes, 101 – 300 W/m^2.	▪ Visual impacts as a result of construction activities and turbines during operation; ▪ Noise generation as a result of construction activities and turbines during operation; ▪ Bird and bat collisions during the operational phase; ▪ More restrictive buffers due to presence of Verreaux's Eagle in the wider study area (which were recorded during the site monitoring); ▪ Impacts on avifauna, aquatic ecology and terrestrial ecology; and ▪ Impacts on archaeology and palaeontology.	▪ Yes

5.1.5 Site Alternatives

The 2014 NEMA EIA Regulations (as amended), requires a site selection matrix to be provided to show how the preferred site was determined through a site selection process. Within this context, it is understood that the "site" referred to in the Regulations are the farms or land portions earmarked for the development of the proposed project. This is essentially the proposed project study area, which consists of farm portions indicated in Table 5.2.

Table 5.2: Farm portions forming the study area

FARM PORTION	21-DIGIT SURVEYOR GENERAL CODE	AREA (ha)
WEF, SUBSTATION COMPLEX, AND INTERNAL ROADS		
Elands Fontein Farm RE/24	C00900000000002400000	2 229
EGI CORRIDOR		
Elands Fontein Farm RE/24	C00900000000002400000	166
Drooge Onrust Farm RE/22	C00900000000002200000	

The preferred site (i.e. study area) was strategically selected by the Project Developer based on various factors and detailed research, as noted below:

- As an initial step, the Project Developer undertook internal research, exploration work, and a desktop feasibility analysis (based on the grid connection options, solar and wind resources, and land availability) in order to identify the preferred site. When selecting the preferred site, the developer also considered the following:
    - Proximity to the national grid: The various WEFs and SEFs forming part of the GEED Beaufort West Renewable Energy cluster will connect to proposed GEED on-site substations or collector substations, followed by overall connection to the proposed Nuweveld Main Transmission Substation (MTS)via a 400 kV external power line, as well as a 132 kV power line from the Windy Plains WEF (which will be subjected to separate Environmental Assessment processes, where relevant). This is considered a significant site selection consideration for the Project Developer, as grid connection is an essential factor.
    - Proximity to the Square Kilometre Array (SKA): It was also important for the site to be located outside of the SKA core and spiral arms, and a significant distance from the Karoo Central Astronomy Advantage Area (KCAAA) sensitivity zones so that there are no unacceptable impacts on the SKA, which could potentially be a fatal flaw or require significant investment in Radio Frequency Interference and Electromagnetic Control studies to be undertaken. Note that the project does fall within the KCAAA 1, however the South African Radio Astronomy Observatory (SARAO) confirmed that the project represents a low risk of interference to the nearest SKA radio telescope.

- The Project Developer then consulted the National Department of Forestry, Fisheries and the Environment (DFFE) Screening Tool and other available datasets, such as the Western Cape and Northern Cape Critical Biodiversity Area (CBA) maps, and the South African National Biodiversity Institute (SANBI) Biodiversity GIS (BGIS) system, as well as the Endangered Wildlife Trust (EWT) No-Go Screening Tool, in order to identify desktop environmental sensitivities and to determine if there are any fatal flaws and concerns. The findings indicated that the study area is generally developable.

- The Project Developer also consulted with the owners of the farm portions forming the study area to obtain consent to develop the proposed project, and to also identify any areas where development must be excluded based on the requirements of the landowners. These landowner exclusion zones were then acknowledged and implemented, which influenced the site selection process.

- A key priority for the Project Developer was to find a site which has favourable wind and solar resources for the development of a hybrid renewable energy system comprising of WEFs and SEFs. The mean wind power density map shows that the project study area falls within an area of approximately 101 – 300 W/m^2 (Figure 5.1). In terms of the suitability of solar energy development at this location, the proposed project study area falls within the second highest GHI category of 2 000 kWh/m^2 to 2 200 kWh/m^2 in terms of the long-term yearly total. The site proposed for the Eland WEF and adjacent farm portions therefore meets the requirements for the hybrid REF.

At a local level, the affected farm portions for the development of the proposed project were selected based on a combination of the factors listed above. Furthermore, from an impact and risk assessment perspective, the implementation of the proposed project at the **preferred site** will most likely result in fewer risks in comparison to its implementation at alternative sites within the Western Cape and Northern Cape (i.e. regions with similar solar radiation and wind resource levels), based on the following points:

- There is no guarantee that the current land use of alternative sites will be flexible in terms of development potential, for example, the agricultural potential at the alternative sites might be higher and of greater significance.
- There is no guarantee of the willingness of other landowners to allow the implementation of a WEF on their land and if the landowners strongly object, then the project will not be feasible.
- There is no guarantee that other sites will be located close to existing or proposed EGI to enable connection to the national grid. The further away a project is from the grid, the higher the potential for significant environmental and economic impacts associated with the length of the grid connection needed overall.

5.1.5.1 Site Specific Considerations

As indicated above, the preferred site for the proposed project extends over the farm portions indicated in Table 5.2.

On a site specific level, the preferred site was deemed suitable due to all the site selection factors (such as land availability, environmental sensitivities, wind speed levels, distance to the national grid, site accessibility, topography, current land use and landowner willingness) being favourable. The site selection criteria considered by the Project Developer are discussed in detail below in Table 5.3.

Table 5.3: Site selection factors and suitability of the preferred site for the development of the proposed project

Factor	Suitability of the Preferred Site
Land Availability	The farm portions comprising the preferred site are of a suitable size for the proposed project. The land available for the development of the proposed project is approximately 2 229 ha in extent for the WEF and 166 ha for the EGI corridor. Although this total area was assessed by the specialists during the site sensitivity verifications and assessments, the entire area will not be required for the permanent development footprint of the proposed project and its associated infrastructure. Refer to Chapter 2 of this EIA Report for project footprint specifications.
Environmental Sensitivity	Although the preferred site for the proposed project does contain environmental features that need to be avoided due to very high or high environmental sensitivity, as described in Chapter 3, and other relevant chapters of the EIA Report, as well as the Specialist Studies and Inputs in Appendix G of this EIA Report, following these exclusions sufficient suitable land is still available to ensure the development feasibility of the proposed project.

Factor	Suitability of the Preferred Site
Wind Speed Levels	The availability of the wind resource is the main driver of project viability. The project site was identified by the Project Developer through a desktop analysis based on the estimation of the wind energy resource, and other factors. Other factors included the installation of on-site wind measuring meteorological (met) masts to provide wind- and meteorological measurements in order to verify the presence of the wind resource. Data received from consistent measurements over 12 months indicated that the wind resource at the proposed project site is more than adequate for the development of a WEF. This viable wind resource ensures the best value for money is gained from the project, allowing for competitive pricing and maximum generation potential, with the resulting direct and indirect benefits for the South African economy. The study area falls within an area of approximately 101 – 300 W/m^2 on the mean wind power density map.
Distance to and availability of the Grid	The various WEFs and SEFs forming part of the GEED Beaufort West Renewable Energy cluster will connect to proposed GEED on-site substations or collector substations, followed by overall connection to the proposed Nuweveld MTS via a 400 kV external power line, as well as a 132 kV power line from the Windy Plains WEF (which will be subjected to separate Environmental Assessment processes, where relevant).
Site Accessibility	Existing roads will be used as far as practically achievable. The envisaged access to the proposed development would be from Divisional Road 2315 (DR02315). The DR02315 is a level 4 road classified as a collector road, providing accessibility to nearby towns and main roads. The DR02315 starts at the DR02313 and intersects with the DR02314 before ending at the TR05801 (R381). The proposed project will have a total internal service road network of up to approximately 35 km. Permanent roads will be up to 6 m wide and may require side drains on one or both sides. All roads may have underground cables running next to them. A 12 m wide road corridor may be temporarily impacted during construction and rehabilitated to 6 m wide after construction. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles, temporary passing lanes, side drains, and/or stormwater control measures. The network layout is designed to provide efficient access to all elements of the facility and effective accommodation of the anticipated internal traffic. The internal service roads will comprise of both existing and new roads. Existing unnamed roads will be used as far as possible and will be upgraded, expanded, and compacted. New roads will be constructed in the absence of existing roads. Refer to the Traffic Impact Assessment (Appendix G.9 of this EIA Report) and Chapter 2 of this EIA Report for additional information on the route options per project.
Topography	The Nuweveldberge, on which the proposed WEF lies, forms the central and most arid component to the southern Great Escarpment which straddles the Northern and Western Cape, comprises of dolomite sills. They are located approximately 37 km to the south of the proposed Eland WEF, adjacent to the Karoo National Park. The study area occurs on land that ranges in elevation from about 750 m above sea level in the southern portion of the study area to about 1 950 m above sea level on the tops of the mountains to the east. The proposed

Factor	Suitability of the Preferred Site
	development site itself is located at an average elevation of 1 750 m above sea level. The overall terrain morphological description of the southern portion of the study area is steep slopes of koppies, buttes, mesas, while the northern portion is a more dissected landscape associated with the tributaries of the upper catchment of the Sak River and is often rocky. The site is mostly underlain by Middle to Late Permian continental fluvial and lacustrine sediments of the lower portion of the Teekloof Formation, which have been intruded by Jurassic dolerite dykes and sills. The bedrock is further mantled by Quaternary alluvium, gravel, and calcrete.
Current Land Use	Agriculture (mainly low-density livestock grazing).
Landowner Willingness	All affected landowners have signed letters of consent for the use of the land for the proposed project (should an EA be granted). This is considered an important aspect of the proposed project in terms of its viability (i.e. this will limit potential appeals during the decision-making process, as the landowner is willing and supportive of the proposed project being undertaken on the affected farm portions).

Furthermore, the proposed project forms part of a large cluster of REF projects (2 SEFs and numerous WEFs). The main determining points for the Project Developer was to find suitable, developable land in contiguous blocks to (i) optimize design, (ii) minimize construction and operational costs, and (iii) minimize sprawling development and limit the impact footprints. In addition, the proximity to the proposed and existing EGI infrastructure was also a major determinant for identifying suitable sites for the proposed development.

Given the site selection requirements associated with the holistic hybrid energy cluster and the suitability of the land available on the **preferred site**, and the fact that no initial fatal flaws are present on the site, as well as the motivating factors listed above, **no other site alternatives were considered as part of this Scoping and EIA Process. Therefore, the site is deemed feasible and selected as the preferred site.**

5.1.6 Location Alternatives – Development Footprint within the Preferred Site

The strategic process followed to reach the preferred site and to consider various development footprints (or location alternatives) within the preferred site are discussed in this section and illustrated in Figure 5.4. The approach followed is to use environmental and social constraints to avoid sensitive features, thus applying mitigation hierarchy thinking. This approach replaces the need to rank alternative sites and locations, as it leads to the selection of the least sensitive development footprint.

Once the preferred site was identified, the study area was plotted on the DFFE Screening Tool to identify high-level environmental sensitivities. The Project Developer then determined the **Original Scoping Buildable Areas** based on the high-level environmental screening. Following this, the Council for Scientific and Industrial Research (CSIR) serving as the independent Environmental Assessment Practitioner (EAP), and Specialists, were appointed by the Project Developer to

undertake the Scoping and EIA Processes for the proposed project and the complement of REFs forming part of the GEED Beaufort West Renewable Energy cluster.

As part of the Scoping Phase, the specialists considered the high-level sensitivities identified on the Screening Tool and undertook Site Sensitivity Verifications (SSVs) within the study area, where required, in order to confirm or dispute the sensitivities identified by the Screening Tool. The specialists assessed the full extent of the preferred site for the proposed project, which includes the Original Scoping Buildable Areas (i.e. approximately 2 229 ha). The specialists also assessed the full extent of the Drooge Onrust Farm RE/22 (i.e. 2 961 ha), as well as the full extent of the EGI assessment corridor (i.e. 166 ha). This collectively serves as the study area for this Scoping and EIA Process for the Eland WEF. The specialists then formulated environmental feature and sensitivity maps for the study area based on the initial findings of the specialist assessments, to show the identified environmental features and sensitivities (such as *inter alia* terrestrial biodiversity, aquatic features, avifauna, bats, heritage features etc.) present within the larger study area that was assessed during the Scoping Phase.

Following the identification of sensitivities by the specialists and relevant specialist fieldwork during the Scoping Phase, the Project Developer took such sensitivities, and other considerations, into account and formulated the **Revised Scoping Buildable Area**. The Revised Scoping Buildable Area was used to inform the design of the layout and development footprint of the proposed project, which avoids (where possible) the most sensitive features that were identified by the specialists within the assessed study area. The preliminary layout proposed at the Scoping Phase was further refined and detailed during the EIA Phase and assessed by the specialists. Chapter 7 of this EIA Report includes the proposed project layout maps, which are also included in Appendix C of this EIA Report, as well as in the specialist studies (Appendix G of this EIA Report) and Environmental Management Programmes (EMPrs) (Appendix H of this EIA Report). The layout maps presented at the EIA Phase are final and deemed acceptable by the specialists.

The no-go or very highly sensitive environmental features found within the preferred site were able to be avoided by the location, layout and design of the proposed project, where possible. Note that in some areas, linear infrastructure, such as access roads or the power line, traverse these very high or high sensitivity areas. The relevant specialists have permitted the linear infrastructure located within these areas, as adequate mitigation measures have been provided and incorporated into the relevant EMPrs. Following the exclusion of the required areas, sufficient developable area is still available on site which does not compromise the current ecological integrity of the site. The current layout is thus a culmination of extensive technical, economic and environmental planning.

It must be re-iterated that a strategic site, location and development footprint identification process has been followed, where the selection is informed by the environmental constraints identified through screening. This is based on the mitigation hierarchy approach of firstly trying to avoid impacts through careful siting. Therefore, it must be noted that different site, location or development footprint alternatives are not ranked, but rather a strategic process was followed (as shown in Figure 5.4) where sensitive features are screened out in order to reach the preferred location or development footprint within the preferred site.

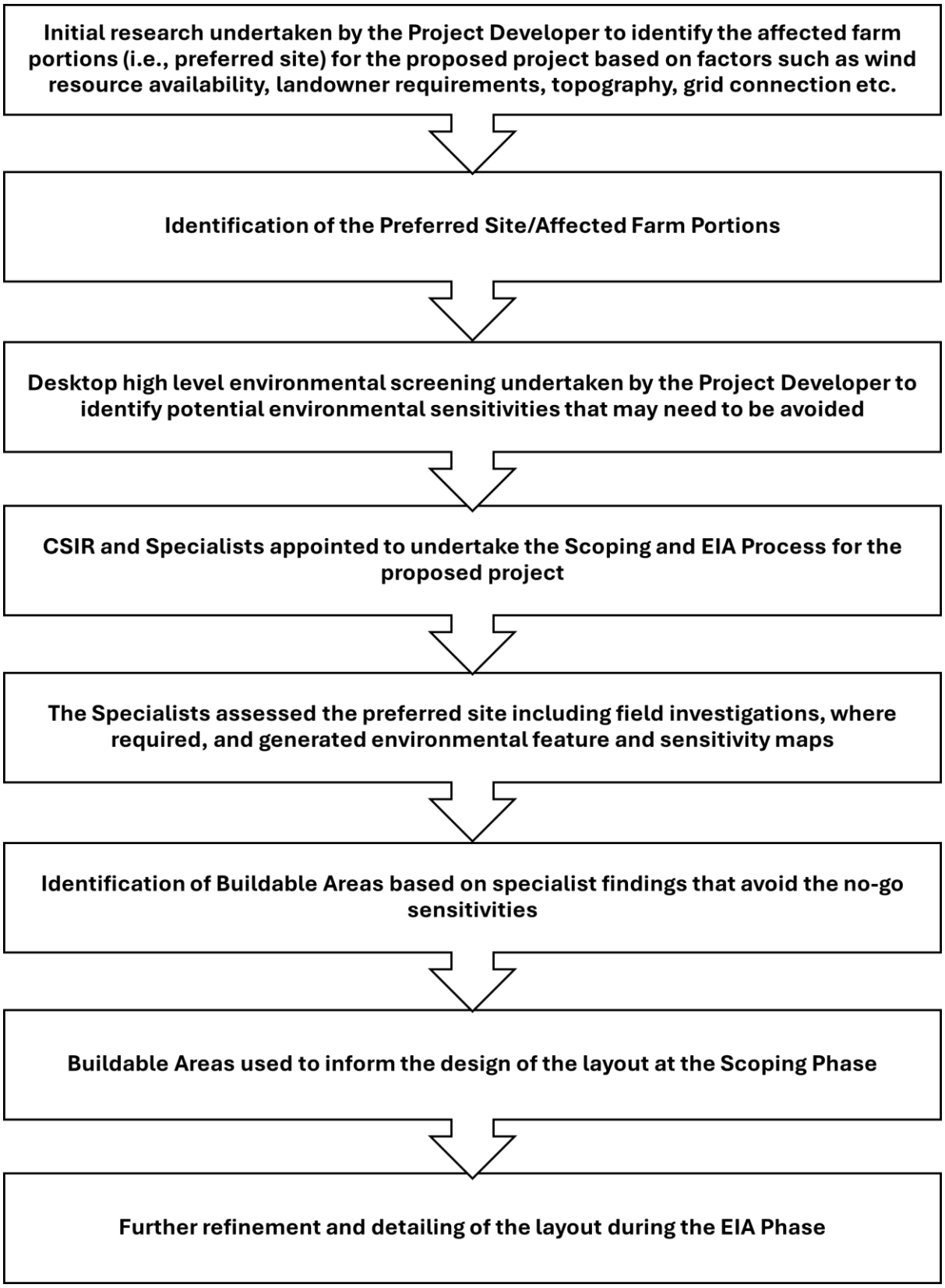

Figure 5.4: Process flow for the identification of the Preferred Site and Development Footprint for the proposed project

5.1.7 Technology Alternatives

As indicated in Chapter 2 of this EIA Report, Solid State Lithium-Ion or Sodium-Ion Battery Energy Storage Systems (BESS) and Redox Flow BESS have been considered and assessed during the Scoping and EIA Phases for the proposed project. Table 5.4 provides high level advantages and disadvantages of the two technologies.

Table 5.4: Advantages and disadvantages associated with the BESS technologies being considered for the proposed project (Sources: Parsons, 2017[12]; Zhang et al., 2016[13])

BESS technologies being considered	Advantages	Disadvantages
Solid State BESS: (1) Lithium-ion and (2) Sodium-ion	▪ Sealed/containerised systems i.e. pre-assembled off site and delivered to site for placement (i.e. carries less potential risk to the environment in terms of spillages). Hence, they are easier to install and will not likely need many permanent staff. ▪ Reduced risk of spillage as storage of large quantities of electrolyte is not required.	▪ Explosions and fires can occur as well as the possibility of generating noxious smoke under these circumstances. This can occur as result of electrolytes mixing when a breach occurs due to: - improper maintenance near operating temperature, - thermal expansion, or - freeze thaw cycles. ▪ Over the long term, these BESS may be more difficult to repurpose / dispose of and may present cumulative long term environmental impacts.
(3) Redox Flow Batteries (RFBs)	▪ RFBs are self-discharging systems therefore generally require little maintenance. However, RFBs are more difficult to install, i.e. formal brick and mortar structures, and will potentially require many permanent staff. ▪ High economic efficiency, for example, Vanadium has a high economic value and can be recycled.	▪ Risk of spillage tends to be higher for RFBs as opposed to sealed solid-state BESS as the storage tanks of RFBs, may be subjected to leaks or spills during the replacement or blending of the electrolyte, or during transport of the battery to and from site. ▪ Electrolyte used is generally considered as a dangerous good in terms of the EIA Regulations, which would most likely trigger listed activities and require the need for an EA.

The Project Developer selected Solid State **Lithium-Ion** or **Sodium-Ion** BESS as the preferred technology type. Both Lithium-Ion and Sodium-Ion BESS technology types were found to be acceptable and preferred during the EIA Phase. Refer to Chapter 7 of this EIA Report for a summary of the concluding statement from the relevant specialists on the BESS alternative consideration.

[12] Parsons, 2017. US Trade and Development Agency. South Africa Energy Storage Technology and Market Assessment. Order Number: TDA-IE201511210. USTDA Activity Number: 2015-11032A. Parsons Job Number: 640368.

[13] Zhang, X., Tang, Y., Zhang, F., and Lee, C. S., (2016). A novel aluminum–graphite dual-ion battery. Advanced energy materials, 6(11), p.1502588.

Refer to Appendix G.10 of this EIA Report for a High-Level BESS Safety, Health and Environment Risk Assessment Report, which provides high level information on the safety, health and environmental risks of the BESS technologies that were considered.

5.2 Concluding Statement of Preferred Alternatives

As per Appendix 3, Section 3 (1) (h) (x) of the 2014 NEMA EIA Regulations (as amended), and based on Section 5.1 above, the following is a concluding statement on the alternatives considered:

- **No-Go Alternative:**
  - The no-go alternative would result in no environmental impacts (positive and negative) on the preferred site or surrounding local area, as a result of the proposed project. The no-go alternative has been assessed in the EIA Phase by all the relevant specialists on the project team. **At the EIA Phase, the no-go alternative is not preferred**.

- **Land-Use Alternative:**
  - The current land-use is agriculture, specifically low-density small stock grazing. The study area has very low agricultural potential. Cultivation is not deemed feasible as a land-use alternative **for assessment during the EIA Phase**. The proposed project offers some positive impact on agriculture by way of improved financial security for farming operations, as well as wider, societal benefits. The Agriculture Compliance Statement (Appendix G.1 of this EIA Report) notes that if the proposed project does not go ahead, due to irregular rainfall, which is likely to be exacerbated by climate change, agriculture in the area will come under increased pressure in terms of economic viability. The Compliance Statement further notes that the proposed project compliments agriculture by providing an additional income source, without excluding agriculture from the land, or decreasing production. Therefore, the negative agricultural impact of the no-go alternative is more significant than that of the development, and so, purely from an agricultural impact perspective, the proposed development is the preferred alternative between the development and the no-go.

- **Type of Activity Alternative:**
  - The generation of electricity from a renewable energy source (particularly from wind) was the only activity considered by the Project Applicant and thus considered in this EIA Report. **No other activity types were considered or deemed appropriate** based on the expertise of the Project Applicant.

- **Renewable Energy Alternatives:**
  - The Project Developer is undertaking Scoping and EIA processes for a holistic renewable energy cluster consisting of both wind and solar energy projects. In terms of the suitability of WEF development at this location, the mean wind power density map shows that the project study area falls within an area of approximately 101 – 300 W/m^2 (Figure 5.1). Local conditions are, therefore, favourable to the Eland WEF development proposed by the Project Developer.
  - In addition, **Hydro Power and Biomass Energy** are deemed **unsuitable**.

- **Preferred Site and Development Footprint within the site:**
  - The preferred site for the proposed WEF comprises the following farm portions, which serves as the 2 229-ha study area for this Scoping and EIA Process:
    - Elands Fontein Farm RE/24;
  - The proposed 132 kV overhead power line within the 300 m wide assessment corridor, which covers an area of approximately 166 ha, will extend from:
    - Elands Fontein Farm RE/24; to
    - Drooge Onrust Farm RE/22.
  - At a specific (local) level, sites on the above listed farm properties were deemed suitable due to all the site selection factors (such as land availability, environmental sensitivities, wind speed levels, distance to the national grid, site accessibility, topography, current land use and landowner willingness) being favourable.
  - Furthermore, a screening and SSV exercise of the study area was undertaken by the specialist team during the Scoping Phase. This led to the identification of the Buildable Areas within the preferred site. The revised Buildable Areas avoid the no-go sensitivities identified by the specialists, where possible. The revised development footprint and layout were identified based on this, which also largely avoid the no-go areas, with some infrastructure allowed to traverse areas of very high and high sensitivity, and micrositing recommended in certain cases.
  - The project layout has been detailed and confirmed during the EIA Phase. A layout plan has been included in Chapter 7 of this EIA Report, as well as Appendix C and the EMPrs.

- **Technology Alternatives**
  - Solid State (Lithium-ion and Sodium-ion) and RFB BESS technologies have been considered and assessed in this Scoping and EIA Process and the preferred alternative (i.e., Solid State **Lithium-ion** and **Sodium-ion** BESS) technology type have been selected and put forward for approval in the EA (should it be granted).

5.3 Summary of Legislative Requirements for the Assessment of Alternatives

As noted in Chapter 1 of this EIA Report, the 2014 NEMA EIA Regulations (as amended) have certain requirements in terms of the selection of the **proposed preferred activity, site and location of the development footprint within the site**. Table 5.5 below indicates the requirements of the 2014 NEMA EIA Regulations (as amended) in terms of alternatives, and a corresponding response from the EAP showing how the requirements have been addressed in this report.

Table 5.5: Requirements for the consideration of Alternatives based on the 2014 NEMA EIA Regulations (as amended)

	Section of the EIA Regulations	Requirements for an EIA Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (as amended)	Response from EAP
1	Appendix 3 – 3 – 1 – h – (i)	3. (1) An environmental impact 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: (h) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including: (i) details of all the development footprint alternatives considered;	Refer to Sections 5.1, 5.2, and 5.3 (i.e. this section) of this chapter which provides a description of the process that led to the identification of the preferred alternatives and which alternatives were taken further into the EIA Phase for assessment. It also provides a description of the process that led to the identification of the development footprint within the preferred site. A strategic site, location and development footprint identification process was followed based on the mitigation hierarchy approach of trying to avoid impacts through careful siting. Therefore, different site, location or development footprint alternatives are not ranked, but rather a strategic process was followed.
2	Appendix 3 – 3 – 1 – h – (ii)	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Refer to Chapter 4 of this EIA Report, which details the process followed in terms of Public Participation. Appendix E of this EIA Report includes the supporting documentation for the Public Participation Process undertaken during the Scoping Phase and EIA Phase.
3	Appendix 3 – 3 – 1 – h – (iii)	(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;	Issues raised by Stakeholders, Organs of State and Interested and Affected Parties (I&APs) prior to and during the 30-day comment period on the Draft Scoping Report were captured and responded to in a Comments and Responses Report included in Appendix E Part 2 of this EIA Report. Appendix E Part 5 of this EIA Report includes the Comments and Responses Report for comments received after the submission of the Final Scoping Report to the DFFE for consideration and before the release of the Draft EIA Report for a 30-day comment period. Comments raised during the 30-day review of the Draft EIA Report will also be captured and responded to in a Comments and Responses Report which will be appended to the Final EIA Report. No new issues or impacts were raised during the Scoping Process, or just before the release of the Draft EIA Report for comment, that were not already addressed during the Scoping

	Section of the EIA Regulations	Requirements for an EIA Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (as amended)	Response from EAP
			Phase or planned to be addressed in the EIA Phase. Appendix G of this EIA Report includes the Specialist Studies and Inputs, which include an assessment of the potential issues and impacts, where relevant. These have also been summarised in Chapter 6 of this EIA Report, where relevant. In addition, the Specialist Studies and Inputs in Appendix G of this EIA Report also discuss the issues raised during the Scoping Phase, where applicable.
4	Appendix 3 – 3 – 1 – h – (iv)	(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Refer to Chapter 3 and Appendix G (Specialist Studies and Inputs) of this EIA Report for a description of the environmental sensitivities associated with the preferred site (i.e. the study area) and the development footprint within. Section 5.1.4 of this chapter also provides information on environmental attributes that were considered in the selection of the preferred site and development footprint for the proposed project.
5	Appendix 3 – 3 – 1 – h – (v)	(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts: (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Feedback on the impacts and risks that informed the identification of the preferred activity (i.e. generation of energy from wind resources) is provided in Section 5.1.3 and Section 5.1.4 above. The impacts and risks identified for the proposed project at the preferred site, including the location of the development footprint within the site, are included in the Specialist Studies and Inputs in Appendix G of this EIA Report, where relevant. The impact assessment, where relevant, includes a description and assessment of the nature, significance, consequence, extent, duration and probability of the identified impacts, as well as an assessment of the reversibility and irreplaceability of the potential identified impacts, as well as the degree to which the identified impacts can be avoided, managed or mitigated. The impact assessment has also been summarised in Chapter 6 of this EIA Report, where relevant. In terms of the no-go alternative, this is not considered as the preferred alternative, as discussed in Section 5.1.1 of this chapter. The impacts and risks of both adopting and not adopting the no-go alternative have been discussed in this section. Furthermore, this has been unpacked by the relevant specialists in this EIA Phase.

	Section of the EIA Regulations	Requirements for an EIA Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (as amended)	Response from EAP
6	Appendix 3 – 3 – 1 – h – (vi)	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	Refer to Chapter 6 of this EIA Report, as well as the Specialist Studies and Inputs (Appendix G of this EIA Report) for the impact assessment methodology that was used in the assessment of impacts, where applicable and relevant.
7	Appendix 3 – 3 – 1 – h – (vii)	(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;	Feedback on the impacts and risks that informed the identification of the preferred activity (i.e. generation of energy from wind resources) is provided in Section 5.1.3 and Section 5.1.4 above. Such feedback relating to the impact the proposed project will have on the affected environment at the preferred site and development footprints, as well as associated recommended mitigation and enhancement measures, are captured in the Specialist Studies and Inputs in Appendix G of this EIA Report, where relevant. The impact assessment and mitigation and enhancement measures have also been summarised in Chapter 6 of this EIA Report, where relevant.
8	Appendix 3 – 3 – 1 – h – (viii)	(viii) the possible mitigation measures that could be applied and level of residual risk;	
10	Appendix 3 – 3 – 1 – h – (ix)	(ix) if no alternative development footprints for the activity were investigated, the motivation for not considering such; and	Where no further alternatives were considered, a motivation has been provided in this chapter, within the relevant sections. This applies to land-use alternatives, type of activity alternatives, renewable energy alternatives, and technology alternatives. However, with regards to alternatives for the preferred site and development footprint within the site, a strategic site, location and development footprint identification process was followed based on the mitigation hierarchy approach of trying to avoid impacts through careful siting. Therefore, different site, location or development footprint alternatives are not ranked, but rather a strategic process was followed.
11	Appendix 3 – 3 – 1 – h – (x)	(x) a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report.	Refer to Section 5.2 of this chapter for a concluding statement.

genesis eco-energy DEVELOPMENTS

Scoping and Environmental Impact Assessment (S&EIA) Process for the Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 6:

Impact Assessment and Sensitivity Analysis

CSIR Touching lives through innovation

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6. IMPACT ASSESSMENT AND SENSITIVITY ANALYSIS

6.1 Approach to the Impact Assessment Methodology and Specialist Assessments

This section outlines the assessment methodology and legal context for specialist assessments, as recommended by the then Department of Environmental Affairs (DEA) 2006 Guideline on Assessment of Impacts.

6.1.1 Impact Assessment Methodology

The Impact Assessment Methodology has been aligned with the requirements for EIA Reports as stipulated in Appendix 3 (3) (1) (j) of the 2014 NEMA EIA Regulations (as amended) which states the following:

"An environmental impact 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 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."

The identification of potential impacts includes impacts that may occur during the construction, operational and decommissioning phases of the 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;
- Developing 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 following principles underpin the application of this methodology:

- Transparent and repeatable process - specialists are to describe the thresholds and limits they apply in their assessment, wherever possible.
- Adapt parameters to context (where justified) – the methodology proposes some thresholds (e.g. for spatial extent, in Step 3 below), however, if the nature of the impact requires a different

definition of the categories of spatial extent, then this can be provided and described by the specialist.
- Combination of a quantitative and qualitative assessment – where possible, specialists are to provide quantitative assessments (e.g. areas of habitat affected, number of jobs), however, it is recognised that not all impacts can be quantified, and then qualitative assessments are to be provided.

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

- **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.

In addition to the above, the Impact Assessment Methodology includes the following aspects, which has been considered and adopted by the relevant specialists:

- **Step 1: Nature of impact/risk** - this reviews the type of effect that a proposed activity will have on the environment and includes “what will be affected and how?” The term environment has a broad interpretation that includes both the natural (biophysical) environment and the socio-economic environment. The term socio-ecological system is also used to describe the natural and socio-economic environment and the interactions amongst these components.

- **Step 2: Status** - Whether the impact/risk on the overall environment (social, biophysical and economic) 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 will not be affected.
    - Note: The significance of a negative impact may be called a risk, and the significance of a positive impact may be called an opportunity.

- **Step 3**: Qualitative determination of the consequence of the impact/risk by identifying the a) spatial extent; b) duration; c) reversibility; and d) irreplaceability.

    - **A) 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 / within the district municipality);
        - National; or
        - International (e.g. Greenhouse Gas emissions or migrant birds).

    - **B) 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)).

    - **C) 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).

    - **D) 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).

These criteria are then combined in a qualitative manner to determine the **consequence**. The consequence terms ranging from slight to extreme (as described below) will be calibrated per Specialist Study, where required, so that there is transparency and consistency in the way a risk/impact is measured.

- **Consequence** – The anticipated consequence of the risk/impact is generally defined as follows:
    - Extreme (extreme alteration of natural or socio-economic systems, patterns or processes, i.e. where environmental or socio-economic functions and processes are altered such that they permanently cease);
    - Severe (severe alteration of natural or socio-economic systems, patterns or processes, i.e. where environmental or socio-economic functions and processes are altered such that they temporarily or permanently cease);
    - Substantial (substantial alteration of natural or socio-economic systems, patterns or processes, i.e. where environmental or socio-economic functions and processes are altered such that they temporarily or permanently cease;
    - Moderate (notable alteration of natural or socio-economic systems, patterns or processes, i.e. where the natural or socio-economic environment continues to function but in a modified manner; or
    - Slight (negligible and transient alteration of natural or socio-economic systems, patterns or processes, i.e. where natural systems/environmental or socio-economic functions, patterns, or processes are not affected in a measurable manner, or if affected, that effect is transient and the system recovers).

- **Step 4**: The **probability** of the impact/risk must be rated using the criteria below:

    - **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).

- **Step 5**: Determination of the **significance** of the identified impact/risk using both the **consequence** and **probability** (qualitatively as shown in Figure 6.1). The 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, very high) against a predefined set of criteria. Significance definitions and rankings are provided below:

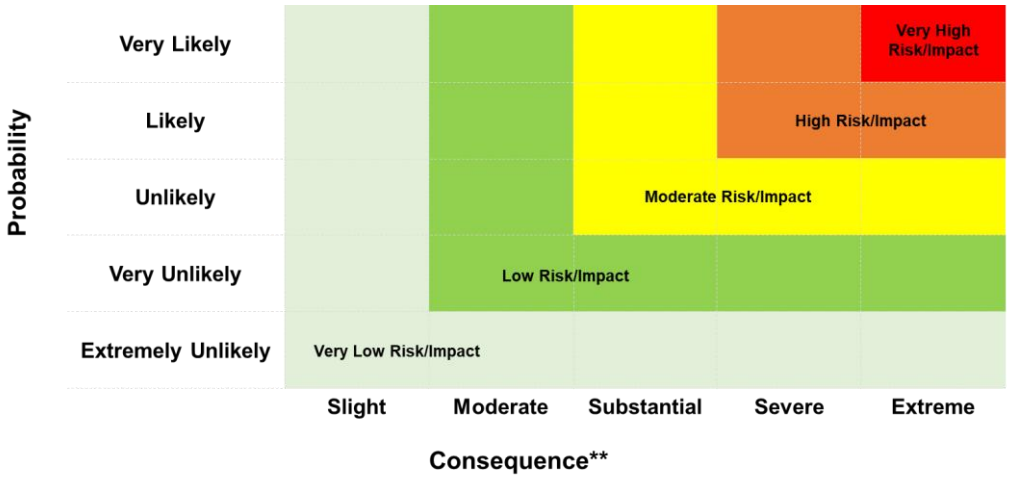


Figure 6.1: Guide to assessing risk/impact significance as a result of consequence and probability.

- **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 are ranked as follows in terms of significance:

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

- **Step 6**: Determine the **Confidence Level** – The degree of confidence in predictions based on available information and specialist knowledge:
  - Low;
  - Medium; or
  - High.

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

- Impacts need to be evaluated for the construction, operational and decommissioning phases of the proposed developments, where relevant. The assessment of impacts for the decommissioning phase may be 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 need to be 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 needs to, where possible, take into consideration the cumulative effects associated with the Genesis Beaufort West Renewable Energy cluster projects and other Wind, Solar PV, and Electricity Grid Infrastructure (EGI) projects which are either developed, received Environmental Authorisation (EA), or in the process of being developed (i.e. that have lodged EA Applications) in the local area (i.e. within 30 km from the proposed study area). Refer to Section 6.1.2 of this chapter for a description of the cumulative impact assessment methodology followed; and
- The impact assessment needs to attempt to quantify the magnitude of potential impacts (direct, indirect and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

Impacts are then collated into the EMPrs and these include the following:

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

Table below has been used by the specialists for the rating of impacts, and repeated for the Construction, Operational and Decommissioning Phases, where relevant.

Table 6.1: Example of Table for Assessment of Impacts/Risks

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
CONSTRUCTION PHASE						
Habitat and species loss as a result of clearance of vegetation for the WEF	***Status***	*Negative*	*Moderate (3)*	*Plant search and rescue (EMPr)*	*Low (4)*	*Medium*
	Spatial Extent	*Site Specific*				
	Duration	*Long-term*				
	Consequence	*Substantial*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Moderate*				

6.1.2 Cumulative Impact Assessment Methodology

The cumulative impact assessment includes other renewable energy projects (i.e. Wind and Solar PV) and the associated EGI required for the realisation of these facilities (i.e., power lines) within a 30 km radius that are in different stages of planning and/or development. These projects are at various stages of the planning and development cycle, including:

- operational / constructed projects (if any);
- undergoing Basic Assessment (BA) or S&EIA processes;
- authorised (EA granted); and
- known pre-application phase projects.

This cumulative impact assessment also includes the proposed Renewable Energy Facilities (REFs) that form part of the GEED Beaufort West Renewable Energy Cluster. The information has been sourced from the National Department of Forestry, Fisheries and the Environment (DFFE) Renewable Energy EIA Application (REEA) database, the South African Heritage Resources Information System (SAHRIS), and from EAPs. The Eskom Generation Connection Capacity Assessment (GCCA) 2022 dataset for planned and existing power lines was also consulted, however, it was found that no power lines within the dataset intersect with the 30 km radius.

Table provides more details, whilst Figure 6.2 provides an illustration of the projects that have been considered in the cumulative impact assessment for the proposed project. Note that the Avifaunal Impact Assessment (Appendix G.4 of this EIA Report),Visual Impact Assessment (Appendix G.5 of this EIA Report), and Bat Impact Assessment (Appendix G.12 of this EIA Report) have considered projects located within a 50 km radius. Refer to the respective appendices for a map and list of projects considered within a 50 km radius.

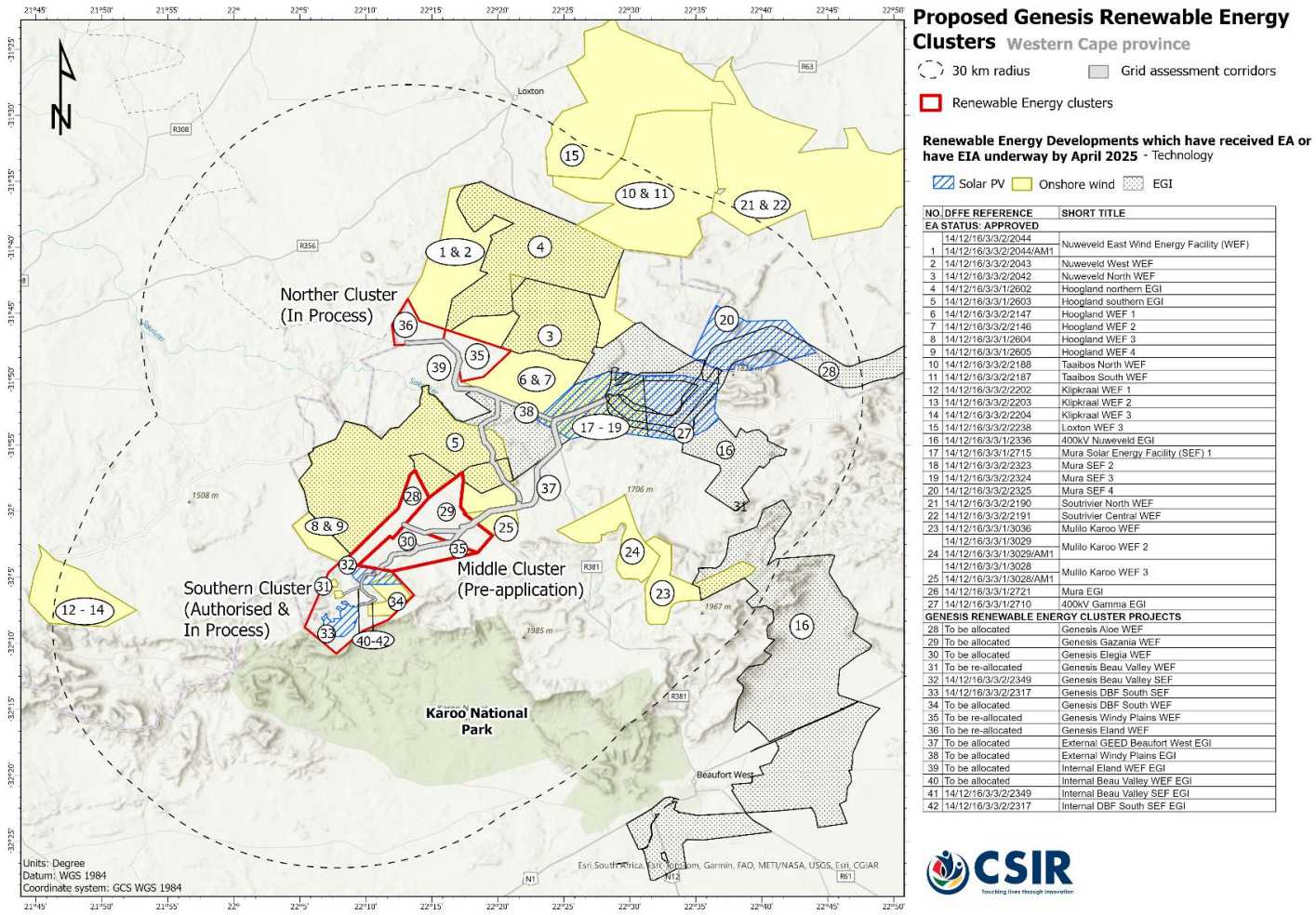
Table 6.2: Proposed REF and EGI projects located within 30 km of the proposed GEED Renewable Energy Cluster and EGI Projects that have been considered in the Cumulative Impact Assessment (in addition to the GEED Renewable Energy Cluster and EGI Projects) (Sources: DFFE REEA Quarter 1, 2025; SAHRIS; Red Cap Energy (Pty) Ltd (2023); Sharples Environmental Services (SES) (2025)).

CSIR NO.	DFFE REFERENCE	TECHNOLOGY	MW/ kV	STATUS	PROJECT SHORT TITLE	PROCESS	APPLICANT	EAP (firm)
1.	14/12/16/3/3/2/2044 14/12/16/3/3/2/2044/AM1	Onshore Wind	280	EA Awarded	Nuweveld East WEF	S&EIA and Amendment	Red Cape Nuweveld East (Pty) Ltd	Zutari (Pty) Ltd
2.	14/12/16/3/3/2/2043	Onshore Wind	280	EA Awarded	Nuweveld West WEF	S&EIA	Red Cap Nuweveld West (Pty) Ltd	
3.	14/12/16/3/3/2/2042	Onshore Wind	280	EA Awarded	Nuweveld North WEF		Red Cap Nuweveld North (Pty) Ltd	
4.	14/12/16/3/3/1/2602	Transmission Line	132	EA Awarded	Hoogland Northern Grid Connection	BA	Red Cap Hoogland 1 (Pty) Ltd	SLR South Africa Consulting (Pty) Ltd
5.	14/12/16/3/3/1/2603	Transmission Line	132	EA Awarded	Hoogland Southern Grid Connection		Red Cap Hoogland 3 (Pty) Ltd	
6.	14/12/16/3/3/2/2147	Onshore Wind	420	EA Awarded	Hoogland WEF 1	S&EIA	Red Cap Hoogland 1 (Pty) Ltd	
7.	14/12/16/3/3/2/2146	Onshore Wind	420	EA Awarded	Hoogland WEF 2		Red Cap Hoogland 2 (Pty) Ltd	
8.	14/12/16/3/3/1/2604	Onshore Wind	420	EA Awarded	Hoogland WEF 3	BA	Red Cap Hoogland 3 (Pty) Ltd	
9.	14/12/16/3/3/1/2605	Onshore Wind	420	EA Awarded	Hoogland WEF 4		Red Cap Hoogland 4 (Pty) Ltd	
10.	14/12/16/3/3/2/2188	Onshore Wind	270	EA Awarded	Taaibos North WEF	S&EIA	Taaibos North Wind Energy Facility (Pty) Ltd	Coastal and Environmental Services (Pty) Ltd
11.	14/12/16/3/3/2/2187	Onshore Wind	270	EA Awarded	Taaibos South WEF		Taaibos South Wind Energy Facility (Pty) Ltd	

CSIR NO.	DFFE REFERENCE	TECHNOLOGY	MW/ kV	STATUS	PROJECT SHORT TITLE	PROCESS	APPLICANT	EAP (firm)
12.	14/12/16/3/3/2/2202	Onshore Wind	300	EA Awarded	Klipkraal WEF 1	S&EIA	Klipkraal Wind Energy Facility (Pty) Ltd	SiVEST SA (Pty) Ltd
13.	14/12/16/3/3/2/2203	Onshore Wind	300	EA Awarded	Klipkraal WEF 2			
14.	14/12/16/3/3/2/2204	Onshore Wind	300	EA Awarded	Klipkraal WEF 3			
15.	14/12/16/3/3/2/2238	Onshore Wind	240	EA Awarded	Loxton WEF 3	S&EIA	Loxton Wind Facility (Pty) Ltd	Arcus Consultancy Services South Africa (Pty) Ltd
16.	14/12/16/3/3/1/2336	Transmission Line	400	EA Awarded	Nuweveld Gridline	BA	Red Cap Nuweveld North (Pty) Ltd	Zutari (Pty) Ltd
17.	4/12/16/3/3/1/2715	Solar PV	150	EA Awarded	Mura SEF 1	BA	Mura 1 (Pty) Ltd	WSP Group Africa (Pty) Ltd
18.	14/12/16/3/3/2/2323	Solar PV	400	EA Awarded	Mura SEF 2	S&EIA	Mura 2 (Pty) Ltd	
19.	14/12/16/3/3/2/2324	Solar PV	320	EA Awarded	Mura SEF 3		Mura 3 (Pty) Ltd	
20.	14/12/16/3/3/2/2325		360	EA Awarded	Mura SEF 4		Mura 4 (Pty) Ltd	
21.	14/12/16/3/3/2/2190	Onshore Wind	270	EA Awarded	Soutrivier North WEF	S&EIA	WKN WIndcurrent SA (Pty) Ltd	Coastal and Environmental Services (Pty) Ltd
22.	14/12/16/3/3/2/2191	Onshore Wind	270	EA Awarded	Soutrivier Central WEF	S&EIA	WKN WIndcurrent SA (Pty) Ltd	
23.	14/12/16/3/3/1/3036	Onshore Wind	348.5	EA Awarded	Mulilo Karoo WEF	BA	Mulilo Karoo Wind Power (Pty) Ltd	Sharples Environmental Services (SES)
24.	14/12/16/3/3/1/3029 14/12/16/3/3/1/3029/AM1	Onshore Wind	357	EA Awarded	Mulilo Karoo WEF 2	BA and Amendment	Mulilo Karoo Wind Power 2 (Pty) Ltd	

CSIR NO.	DFFE REFERENCE	TECHNOLOGY	MW/ kV	STATUS	PROJECT SHORT TITLE	PROCESS	APPLICANT	EAP (firm)
25.	14/12/16/3/3/1/3028 14/12/16/3/3/1/3028/AM1	Onshore Wind	119	EA Awarded	Mulilo Karoo WEF 3		Mulilo Karoo Wind Power 3 (Pty) Ltd	
26.	14/12/16/3/3/1/2721	Transmission Line	132	EA Awarded	Mura Gridline	BA	Mura 1 (Pty) Ltd	WSP Group Africa (Pty) Ltd
27.	14/12/16/3/3/1/2710	Transmission Line	400	EA Awarded	Gamma Gridline Connection	BA	Red Cap Hoogland 1 (Pty) Ltd	CEN Integrated Environmental Management Unit
Renewable Energy Facilities comprising the GEED Middle Cluster								
28.	To Be Allocated	Onshore Wind	230	Pre-application	Genesis Aloe WEF	S&EIA	Genesis Aloe Wind Farm (Pty) Ltd	CSIR
29.	To Be Allocated	Onshore Wind	390	Pre-application	Genesis Gazania WEF		Genesis Gazania Wind Farm (Pty) Ltd	
30.	To Be Allocated	Onshore Wind	530	Pre-application	Genesis Elegia WEF		Genesis Elegia Wind Farm (Pty) Ltd	
Renewable Energy Facilities comprising the GEED Southern Cluster								
31.	To Be Re-Allocated	Onshore Wind	110	Lapsed. To be reapplied for.	Genesis Beau Valley WEF	S&EIA	Genesis Beau Valley Wind Farm (Pty) Ltd	CSIR
32.	14/12/16/3/3/2/2349	Solar PV	200	EA Awarded	Genesis Beau Valley SEF		Genesis Beau Valley Solar Farm (Pty) Ltd	
33.	14/12/16/3/3/2/2317	Solar PV	400	EA Awarded	Genesis DBF South SEF		Genesis DBF South Solar Farm (Pty) Ltd	
34.	To Be Allocated	Onshore Wind	110	Pre-application	Genesis DBF WEF	S&EIA	To Be Determined (Genesis (Pty) Ltd)	CSIR

CSIR NO.	DFFE REFERENCE	TECHNOLOGY	MW/ kV	STATUS	PROJECT SHORT TITLE	PROCESS	APPLICANT	EAP (firm)
Renewable Energy Facilities comprising the GEED Northern Cluster								
35.	To Be Re-Allocated	Onshore Wind	350	Lapsed. To be reapplied for.	Genesis Windy Plains WEF	S&EIA	Genesis Windy Plains Wind Farm (Pty) Ltd	CSIR
36.	To Be Re-Allocated	Onshore Wind	270	Lapsed. To be reapplied for.	Genesis Eland WEF		Genesis Eland Wind Farm (Pty) Ltd	
EGI projects comprising the GEED REF Cluster								
37.	To Be Allocated	Transmission Line	400	Pre-application	External GEED Beaufort West OHPL	To Be Determined	To Be Determined (Genesis (Pty) Ltd)	CSIR
38.	To Be Allocated	Transmission Line	132	Pre-application	External Windy Plains OHPL	To Be Determined	To Be Determined (Genesis (Pty) Ltd)	
39.	To Be Re-Allocated	Transmission Line	132	Lapsed. To be reapplied for.	Internal Eland WEF OHPL	S&EIA	Genesis Eland Wind Farm (Pty) Ltd	
40.	To Be Allocated	Transmission Line	132	Pre-application	Internal Beau Valley WEF OHPL	To Be Determined	To Be Determined (Genesis (Pty) Ltd)	
41.	14/12/16/3/3/2/2349	Transmission Line	132	EA Awarded	Internal Beau Valley SEF OHPL	S&EIA	Genesis Beau Valley Solar Farm (Pty) Ltd	
42.	14/12/16/3/3/2/2317	Transmission Line	132	EA Awarded	Internal DBF South SEF OHPL	S&EIA	Genesis DBF South Solar Farm (Pty) Ltd	



NO.	DFFE REFERENCE	SHORT TITLE
EA STATUS: APPROVED		
1	14/12/16/3/3/2/2044 14/12/16/3/3/2/2044/AM1	Nuweveld East Wind Energy Facility (WEF)
2	14/12/16/3/3/2/2043	Nuweveld West WEF
3	14/12/16/3/3/2/2042	Nuweveld North WEF
4	14/12/16/3/3/1/2602	Hoogland northern EGI
5	14/12/16/3/3/1/2603	Hoogland southern EGI
6	14/12/16/3/3/2/2147	Hoogland WEF 1
7	14/12/16/3/3/2/2146	Hoogland WEF 2
8	14/12/16/3/3/1/2604	Hoogland WEF 3
9	14/12/16/3/3/1/2605	Hoogland WEF 4
10	14/12/16/3/3/2/2188	Taaibos North WEF
11	14/12/16/3/3/2/2187	Taaibos South WEF
12	14/12/16/3/3/2/2202	Klipkraal WEF 1
13	14/12/16/3/3/2/2203	Klipkraal WEF 2
14	14/12/16/3/3/2/2204	Klipkraal WEF 3
15	14/12/16/3/3/2/2238	Loxton WEF 3
16	14/12/16/3/3/1/2336	400kV Nuweveld EGI
17	14/12/16/3/3/1/2715	Mura Solar Energy Facility (SEF) 1
18	14/12/16/3/3/2/2323	Mura SEF 2
19	14/12/16/3/3/2/2324	Mura SEF 3
20	14/12/16/3/3/2/2325	Mura SEF 4
21	14/12/16/3/3/2/2190	Soutrivier North WEF
22	14/12/16/3/3/2/2191	Soutrivier Central WEF
23	14/12/16/3/3/1/3036	Mulilo Karoo WEF
24	14/12/16/3/3/1/3029 14/12/16/3/3/1/3029/AM1	Mulilo Karoo WEF 2
25	14/12/16/3/3/1/3028 14/12/16/3/3/1/3028/AM1	Mulilo Karoo WEF 3
26	14/12/16/3/3/1/2721	Mura EGI
27	14/12/16/3/3/1/2710	400kV Gamma EGI
GENESIS RENEWABLE ENERGY CLUSTER PROJECTS		
28	To be allocated	Genesis Aloe WEF
29	To be allocated	Genesis Gazania WEF
30	To be allocated	Genesis Elegia WEF
31	To be re-allocated	Genesis Beau Valley WEF
32	14/12/16/3/3/2/2349	Genesis Beau Valley SEF
33	14/12/16/3/3/2/2317	Genesis DBF South SEF
34	To be allocated	Genesis DBF South WEF
35	To be re-allocated	Genesis Windy Plains WEF
36	To be re-allocated	Genesis Eland WEF
37	To be allocated	External GEED Beaufort West EGI
38	To be allocated	External Windy Plains EGI
39	To be allocated	Internal Eland WEF EGI
40	To be allocated	Internal Beau Valley WEF EGI
41	14/12/16/3/3/2/2349	Internal Beau Valley SEF EGI
42	14/12/16/3/3/2/2317	Internal DBF South SEF EGI

Figure 6.2: Renewable energy and EGI projects within the 30 km radius considered for the Cumulative Impact Assessment (Sources: DFFE REEA Quarter 1, 2025; SAHRIS; Red Cap Energy (Pty) Ltd (2023); Sharples Environmental Services (SES) (2025).

6.2 Assessments of Environmental Risks and Impacts

The purpose of this chapter is to present a synthesis of the key issues, potential impacts (direct, indirect and cumulative, where applicable), and mitigation measures that have been identified by specialists as part of the EIA Process for the proposed Genesis Eland WEF (hereafter referred to as the "WEF" or "proposed project"). Refer to Appendix G of this EIA report for the full specialist reports. Table provides an indication of each specialist study, as well as the Appendix in which the study is included, for reference purposes.

Table 6.3: Specialist Studies undertaken and the relevant Appendix in which it is included

Specialist Study	Appendix of the EIA Report in which the Specialist Study is included
Agriculture and Soils Compliance Statement	Appendix G.1
Terrestrial Biodiversity and Terrestrial Animal Species Impact Assessment, and Terrestrial Plant Species Compliance Statement	Appendix G.2
Aquatic Biodiversity and Species Impact Assessment	Appendix G.3
Avifauna Impact Assessment	Appendix G.4
Visual Impact Assessment	Appendix G.5
Heritage Impact Assessment (Archaeology and Cultural Landscape)	Appendix G.6
Palaeontology Impact Assessment	Appendix G.7
Socio-Economic Impact Assessment	Appendix G.8
Traffic Impact Assessment	Appendix G.9
Battery Energy Storage System (BESS) High Level Safety, Health and Environment Risk Assessment	Appendix G.10
Geotechnical Impact Assessment	Appendix G.11
Bat Impact Assessment	Appendix G.12
Noise Impact Assessment	Appendix G.13
Wake Effects	Appendix G.16

Refer to Chapter 4 and Appendix G of this EIA Report for details on the legislation (i.e. Appendix 6 of the 2014 NEMA EIA Regulations (as amended) or 2020 Assessment Protocols) applicable to each of the specialist studies, as well as the Terms of Reference adopted. All proposed mitigation measures, as relevant, have been carried over into the Environmental Management Programmes (EMPrs) included in Appendix H of this report.

6.2.1 Soils and Agricultural Potential

The specialist has confirmed that the agricultural sensitivity within the project footprint ranges from low to medium agricultural sensitivity, and some parts of the site are confirmed as very high sensitivity (which are avoided by the proposed infrastructure). Therefore, an Agricultural Compliance Statement is needed. As noted in the Agricultural Compliance Statement (Appendix G.1 of this EIA Report), formally rating potential agricultural impacts is not required by the Assessment Protocol of GN 320, however it is required to indicate whether the proposed development will have an unacceptable impact on the agricultural production capability of the site.

Impact Assessment:

The following potential **negative** impacts were identified:

- Construction, Operational and Decommissioning Phases: Loss of agricultural production potential due to exclusion of agriculture from land directly occupied by development infrastructure. This occurs during the entire development lifetime. Note that the impact of the project on production potential is insignificant, as agricultural activities can continue unaffected, apart from the minimal project footprint, which excludes agriculture.

- Construction and Decommissioning Phases: Loss of agricultural production potential due to soil degradation, which includes soil erosion and loss of topsoil. This could occur predominantly in the construction and decommissioning phases of a development. It can be effectively prevented by generic mitigation measures that are all inherent in the project engineering of such a development and are standard, best-practice for construction sites. Soil degradation does not therefore pose a significant impact risk.

The following potential **positive** impacts were identified:

- Operational Phase: Increase in agricultural production potential due to increased financial security for farming operations through rental income generation for the farm during the operational phase of a renewable energy development. This provides reliable and predictable income that is independent of variable agricultural economic factors such as weather, agricultural markets and agricultural input costs. This is a big economic advantage for a farmer and can improve farming operations and productivity.

- Operational Phase: Increase in agricultural production potential through an improved road network, with associated storm water handling system. The wind farm will construct new turbine internal access / service roads (where existing roads cannot be upgraded, expanded, or compacted for use). The new turbine internal roads will be of a higher standard than the existing farm roads which will give farming vehicles better access to farmlands. This will be especially relevant during wet periods when access to croplands for spraying etc. is limited by the current farm roads.

Cumulative Impact Assessment:

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of future agricultural production potential. The cumulative impact of loss of future agricultural production potential is assessed as low. It will not have an unacceptable negative impact on the agricultural production capability of the area.

Mitigation Measures:

The most important and effective mitigation of agricultural impacts for any development is avoidance of viable, potential cropland. The proposed project has already applied this mitigation by deliberately locating the WEF where it avoids all viable, potential cropland in the area. Mitigation measures to prevent soil degradation are all inherent in the project design and/or are standard, best-practice for construction sites.

For the proposed on-site substation and power line, there are no additional mitigation measures required, over and above what has already been included in the Generic EMPrs for substation infrastructure and overhead electricity infrastructure for the transmission and distribution of electricity, as per GN 435, which was published in on 22 March 2019.

The two main mitigation measures for inclusion in the EMPr are discussed below:

- A system of storm water management, which will prevent erosion, will be an inherent part of the road engineering on site. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there.

- Any excavations done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 20 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it is at the surface. Topsoil should only be stripped in areas that are excavated. Across the majority of the site, including construction lay down areas, it will be much more effective for rehabilitation, to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire surface.

Other inputs to the EMPr are described in the Compliance Statement and included in the EMPr (Appendix H.1 of this Report).

Concluding Statement:

The overall negative agricultural impact of the development (loss of future agricultural production potential) is assessed as being of low significance and as acceptable. From an agricultural impact point of view, it is recommended that the development be approved. Additionally, from a cumulative agricultural impact perspective, it is recommended that the development be approved. The conclusion of the agricultural assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions, other than recommended mitigation.

6.2.2 Terrestrial Biodiversity and Species

Impact Assessment:

The following potential impacts on Terrestrial Biodiversity and Species were identified that are likely to be associated with the proposed development:

Construction Phase:

- **Fragmentation and loss of natural habitat and sensitive features.** The proposed WEF will result in the loss of approximately 124 ha from the 2228.63 ha site, leading to vegetation loss, habitat fragmentation, and increased edge effects. Some infrastructure overlaps with Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), potentially reducing biodiversity, ecological functioning, and conservation value. Habitat removal for roads, turbines, and laydown areas may negatively affect the Karoo Dwarf Tortoise, which depends on vegetation and rocky refugia for shelter and thermoregulation. While vegetation can typically recover from disturbance over time, destruction of rocky habitats, particularly those used for refugia, will be permanent. Watercourse habitats provide key ecological corridors but will recover slowly, while karroid shrubland and grassland habitats have good habitat connectivity with potentially functional ecological corridors with minor current negative ecological impacts.

- **Impacts on national and provincial protected plant species (SCC).** No plant SCC were recorded in the study area, but at least 4 SCC occur in the wider region which have a moderate to high probability of occurrence.

- **Disturbance, loss or displacement impacts on animal SCC.** Species potentially affected by the proposed WEF and associated infrastructure include the Near Threatened Tent Tortoise (*Psammobates tentorius verroxii*), Karoo Dwarf Tortoise (*Chersobius boulengeri*), Riverine Rabbit (*Bunolagus monticularis*), and Mountain Reedbuck (*Redunca fulvorufula*). Construction activities will result in noise, dust, pollution, as well as habitat disturbance, habitat loss, vehicle collisions, barriers to movement, direct mortality, increased predation, and illegal collection or poaching.

- **Introduction and spread of alien invasive species.** Alien and invasive species are more likely to establish in disturbed areas due to construction activities. Vehicles can also transport seeds from other areas and introduce new species previously unknown to the area.

- **Increased erosion and soil compaction.** Vegetation clearing and the movement of heavy machinery during construction are expected to cause soil compaction and increased erosion. Where internal roads cross watercourse habitats, it may result in damage to the habitat, including changes in flow patterns, functionality and erosion. Erosion increases the sediment load in the watercourses, resulting in increased sedimentation downstream of the disturbance. Sedimentation may cause a blockage and alter the characteristics of the watercourse.

- **Littering and general pollution.** The site camp and construction activities are potential sources of pollution, including hydrocarbons, construction material, domestic waste and sewage. Pollution may inhibit plant growth and can cause soil and water pollution if not managed appropriately.

Operational Phase:

- **Direct and indirect faunal disturbance and mortality.** The most negative and significant impacts will likely be the displacement and/or disturbance of faunal communities, or even direct or indirect mortality of fauna. Predation on the Karoo Dwarf Tortoise could increase due to new perching and nesting opportunities for corvids created by infrastructure such as power lines. Non-fauna-friendly fencing may restrict animal movement and genetic exchange, while turbine noise and infrasound could result in habitat degradation through reducing the ability of fauna to detect prey or predators through auditory cues.

- **Increase in alien invasive species.** After construction, alien invasive species could have established in optimal conditions. If not managed, these species can spread and reduce plant species diversity and could alter species composition.

- **Loss of species composition and diversity.** Although most vegetation loss occurs during construction, secondary and cumulative impacts may continue. Road maintenance, soil compaction, and changes in drainage patterns may alter species composition, whereas ineffective management of invasive alien control and rehabilitation can lead to long-term transformation of the local plant community and loss of biodiversity value. Additionally, turbine activity and human presence may alter faunal behaviour and alter local species dynamics.

- **Littering and general pollution.** The most likely type of pollutants are hydrocarbons spilled when refuelling vehicles, leakages from poorly maintained vehicles, spillage from maintaining machinery on site and littering at the site office or security gate.

Decommissioning Phase:

Appendix G.2 of this EIA Report notes that the decommissioning of large-scale wind farms in South Africa is not well known, therefore the regulatory framework and impacts associated with this phase are based on assumptions.

- **Direct and Indirect disturbance and mortality of fauna.** It is expected that the dismantling of turbines and associated infrastructure can lead to disturbance of fauna community, in all ways similar to that resulting from the construction phase.

- **Loss of habitat.** Vegetation loss and habitat fragmentation may result in further loss of fauna and flora species composition and diversity.

- **Disposal of used parts - waste management.** The disposal of used parts is a major issue. Where possible, all recyclable materials must be repurposed in an environmentally friendly way. Where not possible, disposal must be done in such a manner that is not detrimental to the environment.

- **Increased alien invasive species.** Machinery can disturb the soil which can create optimal conditions for alien invasive species seeds to sprout and establish in natural areas. Vehicles can also transport seeds from other areas and introduce new, unwanted species previously unknown to the area.

Cumulative Impact Assessment:

Construction, Operation and Decommissioning Phases:

- **Loss and or displacement of plant and animal species of conservation concern.** The Beaufort West Cluster Development projects have the potential to contribute to cumulative impacts on local fauna, particularly due to an anticipated increase in traffic, habitat loss and disturbance within the area. The proposed Cluster developments are situated within a region identified as core habitat for the Riverine Rabbit in the Upper Karoo and an important corridor for the Karoo Dwarf Tortoise, an area already experiencing growing pressures from renewable energy developments. In fact, this is the largest expanding area for renewable energy developments within the Karoo Dwarf Tortoises and Riverine Rabbits range, indicating that this area cumulatively contributes more pressure on both these species than anywhere else in the country, especially considering that both these species are endemic to the country and found nowhere else in the world.

- Increased alien invasive species.

Construction and Decommissioning Phases:

- Loss of CBAs, natural vegetation, and sensitive features.

Concluding Statement:

Considering the above-mentioned information, no fatal flaws are expected for the proposed project. It is highly recommended that all infrastructure be positioned outside of areas classified as having high or very high sensitivity, specifically through micro-siting of turbines to avoid these sensitive areas. It is the opinion of the specialist that the project, may be considered for authorisation, on condition all avoidance, prescribed mitigation measures and supporting recommendations are implemented. Should the layout be amended, and significant changes occur which impacts on sensitive features, all necessary protocols need to be followed to ensure all highly sensitive areas are avoided.

Refer to Appendix G.2 of this EIA Report for detailed information on the potential impacts identified and mitigation measures recommended. The table below provides a summary of the EIA Level impact assessment for this study.

Table 6.4: Impact assessment of the potential Terrestrial Biodiversity and Species risks and impacts of the proposed project.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
CONSTRUCTION PHASE						
Habitat loss and fragmentation of non-threatened ecosystem, terrestrial CBA2, ESA 2 and ONA (WC BSP) and terrestrial CBA1 (NC BSP)	Status	Negative	High (2)	▪ Within High and Very High sensitivity areas including their buffer zones, turbines and other non-linear infrastructure such as the BESS and Substation must be excluded. ▪ Micrositing should be considered for non-linear infrastructure located in provincial CBAs. ▪ For non-linear infrastructure, the Watercourse habitat should be avoided as far as possible as per the sensitivity map compiled for Terrestrial Biodiversity. In addition, refer to the Aquatic Biodiversity Assessment where the watercourse is delineated, mapped and suitable buffers recommended by the Aquatic Biodiversity specialist. ▪ No construction related activities, such as the site camp, storage of materials, temporary roads or ablution facilities may be located in the very high and high sensitivity areas including their buffers, where relevant. ▪ Minimise the development footprint as far as possible. ▪ Minimise impacts to surrounding natural areas by demarcating development footprint and clearly indicate no-go areas, where practical. However, caution should be exercised to avoid using material that might entangle fauna. ▪ Not all linear infrastructure can avoid high and very high sensitivities, but measures such as making use of existing roads and where possible prioritising development within areas of medium and low sensitivity can reduce impacts significantly. ▪ A Rehabilitation Management Plan must be developed prior to the commencement of construction activities and implemented during the construction and decommissioning phases of the development. Note that the EMPr compiled for the Eland WEF includes rehabilitation measures. ▪ Rehabilitate disturbed areas that are no longer required for the operational phase of the development. Inadequate rehabilitation	Low (4)	High
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Severe				
	Probability	Likely				
	Reversibility	Low				
	Irreplaceability	Moderate				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				could result in limited revegetation and/or an invasion of alien vegetation which will result in long term ecological degradation and damage.		
Loss of protected plant species	Status	Negative	Moderate (3)	▪ A comprehensive Plant Search and Rescue must be undertaken for the approved layout by a suitably qualified botanical specialist prior to vegetation clearance and disturbance. ▪ Where the approved layout designs impact on provincially protected individuals, permit applications are required for either the relocation or destruction of provincially protected species (Western Cape Biodiversity Act, 2021 (Act 6 of 2021), in terms of section 62 of the Nature Conservation Ordinance (as amended), and the 2009 Northern Cape Nature Conservation Act). ▪ Plant SCC found within the proposed site should be housed in an onsite nursery for use during rehabilitation or be relocated to suitable areas where vegetation clearance will not occur.	Low (4)	High
	Spatial Extent	Site specific				
	Duration	Long term				
	Consequence	Substantial				
	Probability	Very Likely				
	Reversibility	Moderate				
	Irreplaceability	Low				
Disturbance, loss or displacement impacts on animal SCC, especially for Riverine Rabbits and Karoo Dwarf Tortoise	Status	Negative	High (2)	▪ Adhere to the development restrictions placed on areas of Very High and High sensitivities. ▪ Buffer zones are allocated to sensitive or important habitat features to alleviate the effect of habitat loss, habitat fragmentation, disturbances, increased isolation and edge effects. ▪ Obtain relevant permits for translocation of species prior to commencement of construction activities, where relevant. ▪ Search and rescue for sensitive animal species before areas of intact vegetation are cleared and ongoing during construction, as required. This should be conducted by relevant experts with experience in search and rescue of the faunal groups concerned. ▪ Environmental induction for all staff and contractors on-site. ▪ All staff operating motor vehicles must undergo an environmental induction training course that includes instruction on the need to comply with speed limits, to respect all forms of	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Severe				
	Probability	Very Likely				
	Reversibility	Low				
	Irreplaceability	High				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				wildlife (especially reptiles and amphibians) and, wherever possible, prevent accidental road kills of fauna. Drivers not complying with speed limits should be subject to penalties. ▪ Speed restrictions (40 km / hour is recommended) should be in place to reduce the amount of dust caused by vehicle movement along the roads, and to reduce possible fauna fatalities with vehicle collisions. ▪ In areas where Riverine Rabbits and Karoo Dwarf Tortoise are likely active, reduce speed limits to 30km/h and place appropriate signage next to the road to indicate sensitive areas. ▪ Establish and implement an ongoing roadkill monitoring programme (inclusive of wildlife collisions record keeping) to inspect roads for injured and deceased fauna (including tortoises) due to the movement of vehicles to and from site. ▪ If trends or patterns emerge from the data (e.g., high incidence of tortoise mortality), appoint a suitably qualified specialist to develop and implement corrective actions. ▪ Should any sensitive species be killed by any construction vehicles, then the traffic management to and from the site must be reviewed, and appropriate additional mitigation measures should be implemented to further reduce or avoid roadkill. It is recommended to contact and consult with the EWT Drylands Programme during the review process, or alternatively a suitably qualified specialist, institution, or organisation. ▪ Reduce direct mortalities by allowing for fauna to cross the roads and bridges. Where applicable, this can be achieved by constructing fauna underpasses under the roads (large culverts or large open-ended concrete pipes laid into the raised roads). These underpasses should be used in conjunction with "fauna barriers" which prevent the most susceptible small fauna from crossing the roads on the surface by directing them towards the underpasses where they can cross under the roads safely. It is important to note that utilization of underpasses is strongly		

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				dependent on animal body size (larger culverts are more successful) and the surrounding habitat. ▪ Movement barriers (plastic drift fences on either side of the road) for tortoises must be erected along all road stretches within Very High SEI habitats with suitably wide underpasses allowing tortoises to be directed to crossings underneath the road. Underpasses must be at least 1 m wide and 1 m high, with a flat base, must be constructed every 50 m along drift fences, and must be maintained weekly to ensure that they are accessible, clean and fully functional. ▪ Any overhead cabling with associated pylons within and near (within 1 km) areas of suitable habitat should be designed so as to discourage crows from nesting on the structures and preying on Karoo Dwarf Tortoise. ▪ Minimise use of infrastructure that could be used for nesting and making structures less suitable by selecting specific designs or using perch deterrents (most effective are long spikes with sloped base, dense spikes facilitate nest-building). ▪ No additional water sources should be provided: construction of dams or water storage must be prohibited or enclosed in a container without leaks. Artificial surfaces should be constructed in a manner to avoid the pooling of rainwater, with suitable drainage designs. Unused dams should be dismantled. ▪ Driving around in the area as well as noise levels at night should be limited, as should the use of harsh lights which could cause light pollution for nocturnal species. ▪ Where appropriate, sound dampeners must be used. ▪ Avoid the presence of people and vehicles in highly sensitive areas as far as possible. ▪ Fences should be constructed in such a way so that burrowing animals can still gain access. Electrified fences must not have active wires below 20 cm from ground level and a guard wire set		

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				at 20cm can be used to keep larger tortoises away from the fence. ▪ Ground clearing and the digging of trenches should ideally not take place during the dry season (typically June to September), in order to minimise the impacts of dust. Where this is not possible, the appropriate dust suppression measures must be implemented. ▪ Newly cleared and exposed areas must be managed for dust and landscaped with indigenous vegetation to avoid soil erosion. Where necessary, temporary stabilisation measures must be used until vegetation establishes. ▪ No holes or trenches should be left open for extended periods as tortoises may fall in and become trapped. ▪ Trenches should have soil ramps present that allow for tortoises and other fauna to escape. ▪ Holes should also be checked regularly (every second day at least) for tortoises and other fauna that may have fallen in. ▪ The illegal collection, hunting or poaching of any animals at the site should be strictly forbidden except by individuals with the appropriate permits. ▪ Reduce exterior lighting to that necessary for safe operation and implement operational strategies to reduce spill light. Use down-lighting from non-UV lights where possible, as light emitted at one wavelength has a low level of attraction to insects. This will reduce the likelihood of attracting insects and their predators.		
Increased alien invasive species	Status	Negative	Moderate (3)	▪ Implement a site-specific alien and invasive species control and monitoring plan in terms of National Environmental Management: Biodiversity Act (Act 10 of 2004, as amended) (NEMBA) during and after construction. ▪ Alien vegetation, within the development footprints, should be removed from the site and disposed of at a registered waste disposal site.	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Medium term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Low				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ The development footprints and immediate surroundings should be monitored for the growth/regrowth of alien vegetation throughout the construction and operation phases of the project.		
Increased erosion and soil compaction	Status	Negative	Moderate (3)	▪ The clearance of vegetation, at any given time, must be kept to a minimum to reduce the possibility of soil erosion. ▪ Utilise existing access routes as far as possible. ▪ Confine the movement of vehicles to the access routes to and from the site and to the construction areas. Ensure that construction staff do not drive in the surrounding natural vegetation. ▪ Rehabilitate new vehicle tracks and areas where the soil has been compacted as soon as possible after use. ▪ All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. ▪ Monitor the entire site for signs of erosion throughout the construction phase of the project. ▪ Refer to mitigation measures relevant to watercourse crossings and development close to watercourses as recommended by the Aquatic Biodiversity Specialist.	Low (4)	Medium
	Spatial Extent	Site specific				
	Duration	Medium term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Low				
Littering and general pollution	Status	Negative	Moderate (3)	▪ The site camp must not be located in very high and high sensitivity areas and their buffer zones. ▪ Dangerous goods may not be stored within 100m of a watercourse. ▪ Hydrocarbon fuels must be stored in a secure, bunded area. ▪ Sufficient waste disposal bins must be available on site and clearly marked. Skip bins may be required during the construction phase which must be emptied on a regular basis by an approved/licenced waste disposal contractor. Proof of disposal to be kept on file. ▪ All waste must be disposed of properly and not stored or disposed of in open dumps where birds can forage.	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Short to Medium term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Low				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Ablution facilities must be located outside sensitive areas and their buffer zones. ▪ Portable ablution facilities must be regularly cleaned and maintained in good working condition. ▪ Any spillage from ablution facilities must be cleaned up immediately and disposed of in an appropriate manner. ▪ Vehicles must be in good working condition, with no oil, water, or fuel leaks. Vehicles must be regularly inspected, and any problems corrected. ▪ Refuelling may only take place in an appropriate, bunded area. Refuelling may not take place in sensitive areas. ▪ Hydrocarbon spills must be contained and cleaned up immediately. Spill kits must be available on site in case of accidental spillage.		
OPERATIONAL PHASE						
Direct and indirect faunal disturbance and mortality	Status	Negative	High (2)	▪ Reduce the presence of human activity on the project area as far as possible by only focusing on the areas where operational tasks are required. ▪ Persecution of fauna species must be reduced through education and awareness campaigns. No physical harm, collection or hunting to any species may occur. ▪ Minimise use of infrastructure that could be used for nesting and making structures less suitable by selecting specific designs or using perch deterrents (most effective are long spikes with sloped base, dense spikes facilitate nest-building). ▪ Corvid censuses must be included in the avifauna operational monitoring programme, and if corvid populations show large increases, then additional measures such as nest removal and humane euthanising of corvids must be considered and implemented (will require an ornithologist and possible permits). ▪ Speed restrictions (40 km / hour is recommended) should be in place to reduce the amount of dust caused by vehicle movement	Low (4)	High
	Spatial Extent	Site specific				
	Duration	Long term				
	Consequence	Severe				
	Probability	Likely				
	Reversibility	Moderate to Low				
	Irreplaceability	Moderate				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				along the roads, and to reduce possible fauna fatalities with vehicle collisions. ▪ In areas where Riverine Rabbits and Karoo Dwarf Tortoise are likely active, reduce speed limits to 30km/h and place appropriate signage next to the road to indicate sensitive areas. ▪ Establish and implement an ongoing roadkill monitoring programme (inclusive of wildlife collisions record keeping) to inspect roads for injured and deceased fauna (including tortoises) due to the movement of vehicles to and from site. ▪ If trends or patterns emerge from the data (e.g., high incidence of tortoise mortality), appoint a suitably qualified specialist to develop and implement corrective actions. ▪ Movement barriers installed in the construction phase must be monitored and maintained weekly to ensure that they are accessible, clean and fully functional. This can be adapted to biweekly or monthly, depending on the outcomes of the construction phase data and recommendations made. ▪ Avoid the presence of people and vehicles in high and very high sensitivity areas. ▪ No unauthorised persons should be allowed onto the site. ▪ Any potentially dangerous fauna such snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location. ▪ Lower the levels of noise whenever possible and avoid the destruction or disturbance of identified important features. ▪ The illegal collection, hunting or harvesting of any animals at the site should be strictly forbidden except by individuals with the appropriate permits. ▪ All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.		

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Fences should be maintained in such a way so that burrowing animals can still gain access, which will allow other animals to also utilise the holes dug under fences to increase connectivity in the area. ▪ Electrified fences must not have active wires below 20 cm from ground level and a guard wire set at 20cm can be used to keep larger tortoises away from the fence. ▪ Although there is little mitigation possible for turbine noise, potential Riverine Rabbit and Karoo Dwarf Tortoise habitat has been buffered, which would reduce the potential significance of this impact. ▪ Equipment with low noise emissions must be used to not disrupt ecological life cycles (breeding, migration, feeding) of animals. Do not unnecessarily disturb faunal species, especially during the breeding season.		
Loss of species composition and diversity	Status	Negative	Moderate (3)	▪ The loss of species composition and diversity cannot be mitigated due to a permanent structure which will change microclimatic conditions for the life of the facility operation. ▪ Implement appropriate rehabilitation measures to return all disturbed habitats to sustainable, productive use that was representative of the respective vegetation type prior to the commencement of construction.	Low (4)	High
	Spatial Extent	Site specific				
	Duration	Long term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				
Increased alien invasive species	Status	Negative	Moderate (3)	▪ The site-specific alien and invasive species (AIS) Management Plan must be implemented for the first year of the operational phase. Thereafter, alien vegetation must continue to be monitored and eradicated annually throughout the life of the project. ▪ Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site, and a long-term control plan will need to be implemented. Problem woody species such as Prosopis are already present in the area and are likely to increase rapidly if not controlled.	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Medium term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Low				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible. ▪ Alien vegetation, within the development footprints, should be removed from the site and disposed of at a registered waste disposal site.		
Littering and general pollution	Status	Negative	Moderate (3)	▪ All waste must be disposed of properly and not stored or disposed of in open dumps where birds can forage. ▪ Vehicles must be in good working condition, with no oil, water or fuel leaks. ▪ All vehicles must be regularly inspected, and any problems corrected. ▪ Refuelling may only take place in an appropriate, designated bunded area, if relevant. ▪ Any spillages must be reported immediately and dealt with appropriately. ▪ Spill kits must be available on site in case of accidental spillage. ▪ Sufficient waste disposal bins must be available on site and clearly marked.	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Short to Medium term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Low				
DECOMMISSIONING PHASE						
Loss of habitat	Status	Negative	Moderate (3)	▪ The loss of vegetation is unavoidable within the approved layout development footprint, but sensitive areas must be avoided when dismantling of infrastructure. ▪ Implement appropriate rehabilitation measures to return the habitat to sustainable, productive use that was representative of the respective vegetation type prior to the commencement of construction. ▪ The vegetation composition, especially within suitable rocky habitat and surroundings, must be rehabilitated to promote foraging habitat available for the Karoo Dwarf Tortoise. Accordingly, rehabilitation efforts cannot just focus on reseeding grasses but must also include replacement of forb and succulent diversity, appropriately.	Low (4)	Medium
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Low				
	Irreplaceability	Low				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
Direct and Indirect disturbance and mortality of fauna	Status	Negative	Moderate (3)	▪ All infrastructure associated with the project must be dismantled and removed to reduce suitable nesting and perching habitat for corvids. ▪ Pending outcome of corvid censuses included in the avifauna operational monitoring, additional measures might be required. ▪ All disturbed areas and infrastructure must be dismantled and restored to the previous state of habitat structure (both rocks and vegetation) as far as possibly practical. ▪ Decommissioning works should avoid sensitive breeding/migration periods where possible. ▪ Use dust suppression during demolition and earthworks. ▪ Ensure vehicles and equipment are well maintained to reduce emissions, unnecessary hazardous spillage and / or emit lower noises.	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Short term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				
Disposal of used parts – waste management	Status	Negative	High (2)	▪ Align with South African waste management legislation (NEM: WA, NEM: AQA, NWA) and any relevant provincial/municipal by-laws, where relevant. ▪ Prepare a Waste Inventory during decommissioning to categorise materials into the various categories. ▪ Dismantled parts must be reused, repurposed or recycled where possible. ▪ For example, repurposing fibreglass for construction materials (cement co-processing, composite recycling) or innovative reuse (playgrounds, shelters, benches); or ▪ Recover copper and aluminium wiring for recycling. ▪ Where feasible, foundations should be partially removed (at least cut to 1 m below ground) to allow topsoil cover and vegetation re-establishment. ▪ Reuse or recycle crushed concrete as aggregate for construction where feasible. ▪ Unrecyclable waste must be disposed of in the appropriate manner at a registered facility, especially hazardous waste.	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Long term				
	Consequence	Severe				
	Probability	Very Likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Ensure financial provisioning is in place to cover decommissioning and rehabilitation costs. ▪ Assess whether roads should remain (if benefiting local communities) or be rehabilitated. ▪ If roads are to be removed, scarify compacted soil, recontour, and revegetate with indigenous species.		
Increased alien invasive species	Status	Negative	Moderate (3)	▪ Follow an alien and invasive species control and monitoring plan in terms of the NEMBA by implementing appropriate control methods during and after decommissioning.	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Medium term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Low				
CUMULATIVE IMPACTS[1]						
Loss of CBAs, natural vegetation & sensitive features	Status	Negative	High (2)	▪ Demarcate sensitive habitats as no-go areas during construction and at decommissioning. ▪ No placement of turbines and hard surfaces in CBAs. Avoid all terrestrial CBA1 and CBA2 areas. Use existing roads through these areas and avoid construction of new roads as far as possible. ▪ Minimise non-linear development footprint in ESAs, watercourses and other ecologically significant features. ▪ Implement appropriate rehabilitation measures to return all disturbed habitats to sustainable, productive use that was representative of the respective vegetation type prior to the commencement of construction. ▪ Ensure that all the operational phase management plans are fully implemented and that the associated monitoring nd feedback mechanisms to management are in place.	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Permanent				
	Consequence	Severe				
	Probability	Very Likely				
	Reversibility	Low				
	Irreplaceability	High				

[1] Note that the aforementioned mitigation measures indicated in the construction, operational, and decommissioning phases for the relevant impact would also be applicable.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
Loss and or displacement of plant and animal species of conservation concern	Status	Negative	High (2)	▪ To assist with conservation measures, it is recommended that the developer support ongoing Riverine Rabbit and Karoo Dwarf Tortoise conservation and monitoring initiatives in the region. ▪ Adhere to the development restrictions placed on areas of Very High and High sensitivities, including any proposed buffers. ▪ A comprehensive Plant Search and Rescue must be undertaken for the approved layout by a suitably qualified botanical specialist prior to vegetation clearance. ▪ Where the approved layout designs impact on provincially protected individuals, permit applications are required for either the relocation or destruction of provincially protected species (Western Cape Biodiversity Act, 2021 (Act 6 of 2021), in terms of section 62 of the Nature Conservation Ordinance (as amended), and the 2009 Northern Cape Nature Conservation Act). ▪ Plant SCC found within the proposed site should be housed in an onsite nursery for use during rehabilitation or be relocated to suitable areas where vegetation clearance will not occur. ▪ Environmental induction for all staff and contractors on-site. ▪ Ground clearing and the digging of trenches should ideally take place at the end of the dry season, prior to the first rains in order to minimise the impacts of dust. ▪ Search and rescue for sensitive animal species before areas of intact vegetation are cleared and ongoing during construction, as required. This should be conducted by relevant experts with experience in search and rescue of the faunal groups concerned. Obtain relevant permits for translocation of fauna species prior to commencement of construction activities, where relevant. ▪ In areas where Riverine Rabbits and Karoo Dwarf Tortoise are likely active, reduce speed limits to 30km/h and place appropriate signage next to the road to indicate sensitive areas.	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Permanent				
	Consequence	Severe				
	Probability	Very Likely				
	Reversibility	Low				
	Irreplaceability	High				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Should any sensitive faunal species be killed by any construction vehicles, then the traffic management to and from the site must be reviewed, and appropriate additional mitigation measures should be implemented to further reduce or avoid roadkill. Suitably qualified specialist, institution, or organisation should be consulted during the review process. ▪ Fences should be constructed in such a way so that burrowing animals can still gain access. Electrified fences must not have active wires below 20 cm from ground level and a guard wire set at 20cm can be used to keep larger tortoises away from the fence.		
Increased alien invasive species	Status	Negative	Moderate (3)	▪ Implement an alien and invasive species control and monitoring plan in terms of NEMBA during and after construction. ▪ Alien invasive species establishment and spreading should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested with such plants. ▪ If Alien Invasive Species are eradicated and managed at development sites, it should not be a problem cumulatively	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Long term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Low				

6.2.3 Aquatic Biodiversity and Species

Impact Assessment:

The following potential impacts on Aquatic Biodiversity and Species were identified that are likely to be associated with the proposed development:

Construction Phase:

- **Direct Impact: Decrease in habitat integrity.** Disturbance of aquatic habitats within the watercourses with the associated impacts on sensitive aquatic biota. During construction, activities within watercourses could result in the disturbance or destruction of sensitive habitats and any listed and or protected plant or animal species. It is recommended that there is limited disturbance of the aquatic constraint areas indicated and that any disturbed areas be rehabilitated after construction activities are completed. It is however unlikely that construction activities would modify the aquatic habitat and biota to such an extent that the present or future desired state of the watercourses would be compromised.

- **Direct Impact: Decrease in aquatic ecosystem integrity (removal or loss of aquatic vegetation).** The removal of indigenous riparian and instream vegetation will reduce the ecological integrity and functionality of the watercourses. The impact would only be very localised at the proposed road crossings and would not impact the wider river reaches of the watercourses. With rehabilitation, this impact could be reduced to a negligible level.

- **Direct Impact: Reduced water quality. Increased sedimentation and risks of contamination of surface water runoff during construction.** During construction, the earthworks near watercourses will expose and mobilise soil as well as construction materials and chemicals that may end up in the water resources. Any spills during transport or while works are conducted in proximity to a watercourse also have the potential to affect the surrounding biota. Given the low rainfall in the area, if work is undertaken during the drier periods of the year, this impact would be unlikely.

- **Indirect Impact: Decrease in aquatic ecosystem integrity (alien vegetation infestation).** Alien vegetation infestation within the aquatic features due to disturbance. The current presence of alien vegetation on the site is limited. Sources of alien seeds should be prevented from being brought onto the site with imported materials. Monitoring during the construction and post-construction phases for the growth of alien vegetation can mitigate this potential impact.

- **Indirect Impact: Stress on a water resource.** Demand for water for construction could place stress on the existing available water resources. During construction, more water is required than during the operational phase to suppress dust and used in concrete batching. This water would be required for a 1.5 to 2-year period while construction works are ongoing. The water required for the construction phase is anticipated to be 50 000 m^3 per annum. Should water need to be obtained from groundwater, a geohydrological assessment should be undertaken for the proposed abstraction and if this assessment finds that there is suitable groundwater available, then sourcing water from boreholes can be considered. The use of boreholes should

be aligned with the sustainable water yield from these boreholes and the mitigation measures proposed within the geohydrological assessment must be adhered to.

- **Indirect Impact: Road crossing structures may impede flow in the aquatic features.** This impact is indirect and will occur if road crossing structures are not properly designed and they result in impeding watercourse flow and blockages. Low water crossing is preferred, and it is recommended to use existing crossings as best as possible and where allowable.

Operational Phase:

- **Direct Impact: Decrease in aquatic ecosystem integrity (ongoing disturbance).** Ongoing disturbance of aquatic features and associated vegetation along access roads or adjacent to infrastructure that needs to be maintained. As for the disturbance of aquatic features described under construction impacts, the disturbance of aquatic habitat is likely to be very localised to the road crossings. Disturbance of aquatic habitats would only result in a negligible alteration to aquatic ecosystems and processes.

- **Indirect Impact: Decrease in aquatic ecosystem integrity (disturbance of cover vegetation and soil).** Modified runoff characteristics from hardened surfaces have the potential to result in the erosion of hillslopes and watercourses. Limited hardening of surfaces will take place as a result of the proposed projects. Much of this is related to the increased road network and also serves to concentrate and convey runoff with its associated erosion.

- **Indirect Impact: Modified hydraulics in the watercourses as a result of any structures associated with the proposed road crossings through the watercourses.** Any new structures within the watercourses associated with the proposed projects must not impede flow, or fragment the aquatic habitats, in the watercourses. Given the episodic flow in the watercourses, the structures at the road crossings should consist of nothing more than low water crossings that will not impede water or sediment movement. Areas identified as being of high sensitivity should be avoided by the project, with the exception being that existing roads may be widened at these features and powerlines may cross these areas. Stormwater management of access roads on steeper slopes, in particular, needs to be addressed to prevent erosion of the slopes and adjacent watercourses.

- **Indirect Impact: Alien vegetation invasion in aquatic features**. Disturbance of cover vegetation and soil has the potential to result in the invasion of disturbed areas with alien vegetation.

- **Indirect Impact: Stress on a water resource**. Water supply (and possibly sanitation services) is required for the operation of the facility. The water requirements during operation are much lower and could potentially be provided from groundwater without any aquatic ecosystem impacts (the water requirements for the operational phase are about 3 500 m^3 per annum). The availability of groundwater for these projects should be considered in a geohydrological assessment. Boreholes should not be sited within or immediately adjacent to watercourses where they would potentially be impacting the subsurface flow in the watercourses. The baseflow in the watercourse is important in maintaining aquatic vegetation and some aquatic biota. The larger flows in the watercourses are unlikely to be impacted by the proposed projects.

Decommissioning Phase:

- **Direct Impact: Increased disturbance of aquatic habitat** due to the increased activity on the site.

- **Indirect Impact: Increased sedimentation and risks of contamination of surface water runoff**.

Cumulative Impact Assessment:

- **Construction Phase:** Increased disturbance of aquatic habitat due to the increased activity in the wider area.

- **Operational Phase:** Degradation of ecological condition of aquatic ecosystems.

- **Decommissioning Phase:** Increased disturbance of aquatic habitat due to the increased activity in the wider area.

The cumulative impact of the project activities, together with the existing activities in the area, could have the potential to reduce the integrity of the watercourses if not properly mitigated and managed. By implementing suitable buffers (the recommended buffer area between the aquatic features and the project components is 35m from the centre of the smaller streams or along the delineated edge of the valley bottom areas associated with the streams, whichever is furthest) and minimising the works within the river/stream corridors, the impact of the proposed project activities would be low and unlikely to impact the integrity of the aquatic ecosystems.

Concluding Statement:

From a water use perspective, the risk assessment determined that the proposed project poses a low risk of impacting aquatic habitat, water flow and water quality. The water use activities associated with the proposed project could thus potentially be authorised through the general authorisations for Section 21(c) and (i) water uses.

Based on the findings of the specialist assessment, there is no reason, from a freshwater perspective, why the proposed development (with the implementation of the below-mentioned mitigation measures) should not be authorised.

Refer to the Aquatic Biodiversity Impact Assessment in Appendix G.3 of this EIA Report for detailed information on the potential impacts identified and mitigation measures recommended. The table below provides a summary of the impact assessment for this study.

Table 6.5: Impact assessment of the potential Aquatic Biodiversity risks and impacts of the proposed project.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
CONSTRUCTION PHASE						
Direct Impact: Decrease in habitat integrity - Disturbance of aquatic habitat and the associated impact on sensitive aquatic biota	Status	Negative	Very Low (5)	Implement recommended development setbacks, as summarised below, to minimise any works within and disturbance of aquatic ecosystems (and their buffers); and disturbed areas should be rehabilitated after construction is complete: ▪ Recommended buffer of at least 35 m for the smaller drainage features (assigned a medium sensitivity); and ▪ Valley bottom wetland and associated larger watercourses [assigned high sensitivity]. The mapped valley floor area indicated in the sensitivity mapping in this assessment incorporates suitable setbacks for instream wetland habitat. The surrounding valley floor areas are assigned medium sensitivity. The following needs to be considered with regards to the development setbacks: ▪ The areas of high aquatic sensitivity should be treated as no-go areas for non-linear hardened areas (including turbine foundations, auxiliary buildings, BESS, substation complex, etc.), whereas the areas of medium sensitivity should be avoided but can be developed with mitigation (i.e. limit the placement of infrastructure in areas of medium aquatic sensitivity as far as possible). ▪ Service roads and grid connection lines can be constructed in high-sensitivity areas but must be adequately mitigated as stipulated in the Aquatic Biodiversity and Species Report (Appendix G.3 of this EIA Report). ▪ The larger Elandsfontein River with its associated wetland habitat will be crossed by the proposed access roads but will only be undertaken at existing road crossings.	Very Low (5)	High
	Spatial Extent	Site-specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Low				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Some minor watercourses will be crossed by associated linear infrastructure (roads and internal powerlines). Many of these crossings will be at existing road crossings but there are also new roads that need to cross the watercourses. These watercourses are deemed of medium sensitivity.		
Direct Impact: Decrease in aquatic ecosystem integrity - Removal of indigenous aquatic vegetation and associated loss of aquatic ecological integrity and functionality	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Site-specific Medium-term Slight Very Unlikely High Low	Very Low (5)	Implement development setbacks, as summarised below, to minimise works within aquatic ecosystems: ▪ Recommended buffer of at least 35 m for the smaller drainage features (assigned a medium sensitivity); and ▪ Valley bottom wetland and associated larger watercourses [assigned high sensitivity]. The mapped valley floor area indicated in the sensitivity mapping in this assessment incorporates suitable setbacks for instream wetland habitat. The surrounding valley floor areas are assigned medium sensitivity. The following needs to be considered with regards to the development setbacks: ▪ The areas of high aquatic sensitivity should be treated as no-go areas for non-linear hardened areas (including turbine foundations, auxiliary buildings, BESS, substation complex, etc.), whereas the areas of medium sensitivity should be avoided but can be developed with mitigation. ▪ Service roads and grid connection lines can be constructed in high-sensitivity areas but must be adequately mitigated as stipulated in the Aquatic Biodiversity and Species Report (Appendix G.3 of this EIA Report). ▪ The larger Elandsfontein River with its associated wetland habitat will be crossed by the proposed access roads but will only be undertaken at existing road crossings. ▪ Some minor watercourses will be crossed by associated linear infrastructure (roads and internal powerlines). Many of these crossings will be at existing road crossings but there	Very Low (5)	High

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				are also new roads that need to cross the watercourses. These watercourses are deemed of medium sensitivity. The following mitigation has also been provided: ▪ Clearing of indigenous vegetation should be avoided within the aquatic features and the recommended buffers. ▪ Rehabilitate disturbed aquatic habitats by revegetating with suitable local indigenous vegetation.		
Indirect Impact: Stress on a water resource - Water supply for construction and the associated stress on available water resources	Status	Negative	Very Low (5)	▪ Water use for construction should be minimised as much as possible. The water should be obtained from a lawful and existing water allocation or other viable water sources for construction purposes.	Very Low (5)	High
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Extremely Unlikely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				
Indirect Impact: Road crossing structures may impede flow in the aquatic features	Status	Negative	Very Low (5)	▪ The road crossing structures should be properly designed to not impede flow in watercourses, cause blockages or erosion - low water crossing is preferred. Use existing crossings, as best as possible and where allowable. ▪ The existing road infrastructure should be utilised as far as possible to access new infrastructure to minimise the overall disturbance. It is recommended that any new linear type of infrastructure crossing over watercourses be placed where there are existing structures or road crossings within the watercourse corridors, where possible. ▪ In terms of new service tracks, these must be kept to a minimum and should ideally not result in any new/permanent watercourse crossings, but if these are required, then a specific walk down should be conducted with the specialist (prior to construction) to identify the most suited crossing position. Where these crossings do occur, it needs to be monitored for erosion.	Very Low (5)	High
	Spatial Extent	Site-specific				
	Duration	Long term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Low				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
Indirect Impact: Decrease in aquatic ecosystem integrity - Alien vegetation infestation may occur within the aquatic features due to disturbance	Status	Negative	Low (4)	▪ Avoid disturbing aquatic habitats as far as possible. Rehabilitate disturbed aquatic habitats once construction works are complete and revegetating them with suitable local indigenous vegetation if required. ▪ Construction materials brought onto the site should be certified as free of alien plant seed. Sources of alien seed should be prevented from being brought onto the site with imported materials. ▪ Undertake monitoring for the growth of alien vegetation during the construction and post-construction phase.	Very Low (5)	High
	Spatial Extent	Site-specific				
	Duration	Medium or long term				
	Consequence	Moderate				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Low				
Direct Impact: Reduced Water Quality - Increased sedimentation and risks of contamination of surface water runoff may result from construction works	Status	Negative	Very Low (5)	▪ Any works within aquatic features should be undertaken in the dry season where possible. ▪ Sediment traps should be installed and maintained where necessary. ▪ Construction sites and laydown areas should be located within the assessed buildable areas, and should be placed at least 35m away from the delineated aquatic features. ▪ Good housekeeping and site management measures must be implemented at the laydown areas and the construction site as per the project EMPr and monitored by the appointed Environmental Control Officer (ECO).	Very Low (5)	High
	Spatial Extent	Site-specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Likely to Unlikely				
	Reversibility	High				
	Irreplaceability	Low				
OPERATIONAL PHASE						
Direct Impact: Decrease in aquatic ecosystem integrity - Ongoing disturbance of aquatic features and associated vegetation along access roads or adjacent to the infrastructure that needs to be maintained.	Status	Negative	Low (4) / Very Low (5)	▪ The areas of high aquatic sensitivity should be treated as no-go areas for the WEF footprint and hardened areas, whereas and the areas of medium sensitivity should be avoided but can be developed with mitigation (i.e. limit the placement of infrastructure in areas of medium aquatic sensitivity as far as possible). ▪ 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. ▪ Access project infrastructure using existing roads and access tracks established during the construction phase.	Very Low (5)	High
	Spatial Extent	Site-specific				
	Duration	Long term				
	Consequence	Slight to moderate				
	Probability	Likely to Unlikely				
	Reversibility	Moderate				
	Irreplaceability	Low				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Ensure road crossings structures are not resulting in blockage in the watercourses or erosion.		
Indirect Impact: Decrease in aquatic ecosystem integrity (disturbance of cover vegetation and soil) - modified runoff characteristics from hardened surfaces at the substation and along access roads have the potential to result in the erosion of adjacent watercourses.	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Site-specific Long term Slight Unlikely Moderate Low	Very Low (5)	▪ Implement and adhere to a stormwater management plan for the proposed development that addresses the stormwater runoff from the developed areas. ▪ Stormwater run-off infrastructure must be designed to mitigate both the flow and water quality impacts of any stormwater 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. Should any erosion features develop, they should be stabilised immediately.	Very Low (5)	High
Indirect Impact: Modified hydraulics in the watercourses as a result of any structures associated with the proposed road crossings through the watercourses	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Site-specific Long term Slight Unlikely Low Low	Very Low (5)	▪ Any new structures within the watercourses associated with the proposed project must not impede flow, or fragment the aquatic habitats, in the watercourses. ▪ Given the episodic flow in the watercourses, the structures at the road crossings should consist of nothing more than low water crossings that will not impede water or sediment movement. ▪ Areas identified as being of high sensitivity should be avoided by the projects, with the exception being that existing roads may be widened at these features and powerlines may cross these areas. ▪ Stormwater management measures must be in place along the access tracks and built areas to dissipate stormwater and prevent erosion. Cleared areas should be revegetated with suitable indigenous vegetation to assist with the dissipation of runoff and encourage infiltration. Stormwater management of access roads on steeper slopes, in particular, needs to be	Very Low (5)	High

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				addressed to prevent erosion of the slopes and adjacent watercourses.		
Indirect Impact: Alien vegetation invasion in aquatic features - Disturbance of cover vegetation and soil has the potential to result in the invasion of disturbed areas with alien vegetation	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Site specific Short term Slight Unlikely Moderate High	Very Low (5)	▪ Invasive alien plant growth should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested with invasive alien plants.	Very Low (5)	High
Indirect Impact: Stress on a water resource - water supply (and possibly sanitation services) as a result of the operation of the site	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Site-specific Long term Slight Unlikely Low Low	Very Low (5)	▪ A sustainable water supply should be used. ▪ Sewage generated within the site should be discharged to a conservancy tank that is properly serviced and regularly evacuated to nearby wastewater treatment works.	Very Low (5)	High
DECOMMISSIONING PHASE						
Direct Impact: Increased disturbance of aquatic habitat due to the increased activity on the site	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Site-specific Short term Slight Unlikely High Low	Very Low (5)	▪ Minimise works within aquatic ecosystems. The project layout has avoided these areas, thus the decommissioning works must also avoid these aquatic areas of high sensitivity within the study area (except where deemed acceptable by the aquatic specialist e.g. linear infrastructure crossing medium and high sensitivity areas). ▪ Laydown areas should be placed within approved WEF footprint and layout. ▪ Rehabilitate and revegetate disturbed areas, where required. ▪ Mitigation and follow-up monitoring of alien vegetation growth and erosion may be required. ▪ The road network should be returned to that resembling pre-construction, with all additional roads removed where possible.	Very Low (5)	High

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
Indirect Impact: Increased sedimentation and risks of contamination of surface water runoff	Status	Negative	Very Low (5)	▪ Decommissioning activities within aquatic features should be undertaken in the dry season where possible. ▪ Sediment traps should be used and placed downstream of works to capture sediment where necessary. ▪ Good housekeeping measures should be implemented as per the project EMPr and monitored by the appointed ECO. This should specifically address on-site stormwater management and prevention of pollution during decommissioning. ▪ Any stormwater that does arise within the decommissioning site must be handled appropriately to trap sediments and pollutants.	Very Low (5)	High
	Spatial Extent	Site-specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Low				
CUMULATIVE IMPACTS						
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 where possible. ▪ Rehabilitate disturbed areas. ▪ Rationalise infrastructure as far as possible by sharing the infrastructure or using existing disturbed areas. ▪ Manage stormwater impacts.	Very Low (5)	High
	Spatial Extent	Site-specific				
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Low				
OPERATIONAL 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 of watercourses. ▪ Ensure road crossing structures are properly designed to prevent 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				
	Irreplaceability	Low				
DECOMMISSIONING PHASE						
Increased disturbance of aquatic habitat due to	Status	Negative	Very Low (5)	▪ Decommissioning works near aquatic features should preferably be undertaken in the dry season where possible.	Very Low (5)	High
	Spatial Extent	Site-specific				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
the increased activity in the wider area	Duration	Short term		▪ Minimise disturbance and rehabilitate.		
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Low				

6.2.4 Avifaunal Impacts

Impact Assessment:

The following potential impacts on avifauna were identified that are likely to be associated with the proposed development:

Construction Phase:

- **Displacement due to disturbance.** It is inevitable that a measure of displacement will take place for all priority species during the construction phase, due to the disturbance factor associated with the construction activities. This is likely to affect ground nesting species the most, as this could temporarily disrupt their reproductive cycle. Species which fall into this category are Ludwig's Bustard, Karoo Korhaan, Double-banded Courser, Grey-winged Francolin and Spotted Eagle-Owl. Some raptors might also be affected, e.g., Pale Chanting Goshawk which could potentially breed in the small Vachellia trees in the drainage lines and Jackal Buzzard which is breeding in the Project Site. Some species might be able to recolonise the area after the completion of the construction phase, but for some species this might only be partially the case, resulting in lower densities than before once the WEF is operational, due to the disturbance factor of the operational turbines.

- **Displacement due to habitat loss**. The network of roads is likely to result in significant habitat fragmentation, and it could have an effect on the density of several species, particularly larger terrestrial species such as Ludwig's Bustard and Karoo Korhaan, and raptors. Given the current density of the proposed turbine layout and associated road infrastructure, it is not expected that any priority species will be permanently displaced from the Project Site. In the case of the power line, the direct habitat transformation is limited to the pylon footprints. The loss of a relatively small quantity of widely available habitat for priority species due to direct habitat transformation associated with the construction of the proposed overhead power line, is likely to be minimal.

Operational Phase:

- **Mortality due to collisions with the wind turbines.** The proposed WEF will pose a collision risk to several priority species which could occur regularly at the site. Species exposed to this risk are large terrestrial species i.e., mostly bustards such as Karoo Korhaan, Ludwig's Bustard, and Blue Crane, although bustards and cranes generally seem to be not as vulnerable to turbine collisions as was originally anticipated. Soaring priority species, i.e., raptors such as Martial Eagle, Verreaux's Eagle, Booted Eagle, Jackal Buzzard and Lesser Kestrel are most at risk of all the priority species regularly occurring at the project site.

- **Mortality due to electrocutions on the overhead sections of the internal 33 kV cables and in the on-site substation complex**. There could be an electrocution risk to certain species, mostly raptors, but also some waterbirds, on the smaller proposed internal 33 kV power lines, due to the small clearances, unless a bird-friendly structure is used. Electrocutions within the proposed substations are possible, however, the likelihood of this impact on the

more sensitive Red List priority species is remote, as these species are unlikely to regularly utilise the infrastructure within the substation yard for perching or roosting.

- **Mortality due to collisions with the 33 kV overhead lines (if any) and the 132 kV overhead power line.** Collisions are the biggest threat posed by electrical overhead lines to birds in southern Africa. Most heavily impacted upon are bustards, storks, cranes, and various species of waterbirds, and to a lesser extent, vultures. Additionally, power line collisions are generally accepted as a key threat to bustards.

Decommissioning Phase:

- **Displacement due to disturbance associated with the decommissioning of the WEF and associated infrastructure.** The noise and movement associated with the potential decommissioning activities will be a source of disturbance which would lead to the displacement of avifauna from the area.

Cumulative Impact Assessment:

- Displacement of avifauna due to disturbance during construction and decommissioning phases.
- Displacement of avifauna due to habitat loss in the construction phases.
- Mortality of avifauna due to collisions with turbines in the operational phases.
- Mortality of avifauna due to electrocutions on the overhead sections of the internal medium voltage networks and in the substation yards in the operational phases.
- Mortality of avifauna due to collisions with the medium voltage overhead lines in the operational phases.
- Mortality of avifauna due to collisions with the high voltage overhead power lines (grid connections) in the operational phases.

It is imperative that all WEFs within the region strictly apply the mitigation measures as outlined in their respective Avifaunal Specialist Studies and that compliance with the recommended mitigation measures be audited by the governing Authorities (such as DFFE).

Concluding Statement:

The proposed WEF will have high and medium significance impacts on avifauna that could be reduced to medium and low significance impacts through the application of appropriate mitigation measures. The WEF and associated infrastructure layout has taken all avifaunal risk zones into consideration and has adequately avoided or addressed the high-risk areas. No fatal flaws were discovered during the on-site investigations. The project is supported on the condition that all mitigation measures as listed in the Avifaunal Impact Assessment (Appendix G.4 of this EIA Report) are strictly adhered to. The recommendations in the Avifaunal Impact Assessment must be included in the EA for proposed WEF and 132 kV power line.

Refer to the Avifauna Impact Assessment in Appendix G.4 of this EIA Report for detailed information on the potential impacts identified and mitigation measures recommended. The table below provides a summary of the impact assessment for this study.

Table 6.6: Impact assessment of the potential avifauna risks and impacts of the proposed project.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
DIRECT IMPACTS						
CONSTRUCTION PHASE						
The noise and movement associated with the construction activities at the WEF footprint, associated infrastructure, and 132 kV overhead power line will be a source of disturbance which would lead to the displacement of avifauna from the area.	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Site specific Short term Substantial Very likely High Low	Moderate (3)	▪ Vegetation clearance must be limited to what is absolutely necessary and in adherence to a rehabilitation measures. ▪ The mitigation measures proposed by the Aquatic, and Terrestrial Biodiversity Specialists must be strictly implemented, particularly regarding minimising the footprint of the activities. ▪ Construction activity should be restricted to the immediate footprint of the infrastructure, and in particular to the proposed road network. ▪ Access (vehicle and pedestrian) to the remainder of the development site should be strictly controlled to prevent unnecessary disturbance of sensitive species. ▪ Measures to control noise and dust should be applied according to current best practice in the industry. ▪ Maximum use should be made of existing access roads, and the construction of new roads should be kept to an absolute minimum.	Low (4)	High
Total or partial displacement of avifauna due to habitat loss/transformation associated with the construction and presence of the wind turbines, associated infrastructure, and 132 kV power line.	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Site specific Short term Substantial Very likely Moderate Low	Moderate (3)	▪ Vehicle and pedestrian access to the site should be controlled and restricted to the construction footprint to prevent unnecessary destruction of vegetation. ▪ Vegetation clearance must be limited to what is absolutely necessary and in adherence to a rehabilitation measures. ▪ The mitigation measures put forward by the Aquatic, and Terrestrial Biodiversity Specialists must be strictly implemented, especially as far as limitation of the activity footprint is concerned.	Low (4)	Medium

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
OPERATIONAL PHASE						
Bird mortality due to collisions with the wind turbines	Status	Negative	High (2)	No turbines to be located in the buffer zones as indicated in the sensitivity map in Figure 6-4. These buffers are summarised below: ▪ Verreaux's Eagle nest: A 1 km all infrastructure exclusion zone and a 3.7 km turbine (blade-swept) exclusion zone; ▪ Martial Eagle nest: A 2.5 km all infrastructure exclusion zone and a 5 km turbine (blade-swept) exclusion zone; ▪ All mapped drainage lines: A 50 m turbine (blade-swept) exclusion zone; ▪ Elandsfontein River: A 100 m turbine (blade-swept) exclusion zone; ▪ Any boreholes and dams: A 200 m turbine (blade-swept) exclusion zone; ▪ Jackal Buzzard nest: A 750 m turbine (blade-swept) exclusion zone; ▪ Hamerkop nest: A 500 m turbine (blade-swept) exclusion zone. ▪ Verreaux's Eagle nest: All turbines in the area >3.7 km up to 5.2 km should be regarded as medium-risk and relocated if possible. Should relocation not be feasible, these turbines should be subject to pro-active mitigation in the form of a proven mitigation method such as Shutdown on Demand (SDoD), using either bio-monitors or an automated system. ▪ All wind turbines must have one or two blades patterned according to a South African Civil Aviation Authority (SACAA) approved pattern and the latest guidance on blade patterning as published by BirdLife South Africa (BLSA) to reduce the risk of avian collisions. The current guideline is included in Appendix I of the Avifauna Impact Assessment report (which is included in Appendix G.4 of this EIA Report). ▪ The results of the pre-construction monitoring must guide the layout of the turbines, especially as far as proposed no-turbine	Moderate (3)[2]	High
	Spatial Extent	Site specific				
	Duration	Long term				
	Consequence	Severe				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	Low				

[2] The moderate impact significance rating is deemed acceptable if all mitigation measures are strictly implemented, therefore a biodiversity offset is not required.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				zones are concerned. No turbines must be located in the buffer zones which were identified based on the results of the pre-construction monitoring, with a specific view to limiting the risk of collisions to a variety of birds, including several Red Data species. Note that the current layout has taken these buffer zones into consideration. ▪ It is recommended that the minimum tip height of the turbine blades should be at least 25 m, preferably higher, as low flying birds are at greater risk of turbine collisions if the lower tip height is too low. The disturbance factor would be greater too, especially for ground nesting birds. ▪ Formal live-bird monitoring and carcass searches should be implemented in the operational phase, as per the most recent edition of the Best Practice Guidelines at the time (Jenkins et al. 2015) to assess collision rates. ▪ A Biodiversity Management Plan (BMP) must be compiled for the site prior to commercial operation, and potential biological removal (PBR) values for all priority avifaunal species on-site must be determined. The BMP must define acceptable mortality thresholds for species of conservation concern, using the best information on population estimates, trends, Red Data status and guidelines available at the time. If fatality numbers exceed annual thresholds, additional mitigation measures must be implemented as part of the adaptive management strategy. The choice of additional mitigation measures will be dependent on the measures in place at the time and could involve the implementation of SDoD measures or selective curtailment of specific turbines during high-risk periods.		
Electrocution of priority species in the onsite substation complex and on the 33 kV internal overhead power lines.	Status	Negative	Moderate (3)	▪ Monitor the electrocution mortality in the substations monthly. Apply mitigation (insulation of live components) if electrocution of SCC happens more than once per annum. ▪ In instances where the medium voltage cables cannot be buried due to technical constraints or to accommodate other	Low (4)	High
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Severe				
	Probability	Unlikely				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
	Reversibility	High		environmental sensitivities (specifically aquatic ecology), a bird-friendly pylon design must be used, and appropriate mitigation should be implemented pro-actively for pylon structures e.g., insulation of live components to prevent electrocutions on terminal structures and pole transformers. A registered SACNASP Avifaunal Specialist must sign off on the design for the pylons and overhead lines. ▪ Anti-perching devices to be installed on all overhead 33 kV pylons to deter birds.		
	Irreplaceability	Low				
Collision mortality of power line sensitive species due to collisions with the 33 kV lines and the 132 kV overhead power line.	Status	Negative	High (2)	▪ Phosphorescent-type Bird Flight Diverters (BFDs) must be fitted in a staggered configuration (on the earth wire and conductor) to all overhead lines for the full length according to the applicable Eskom Engineering Instruction (5 m apart for medium voltage power lines and 15 m apart for high voltage power lines). These devices must be installed as soon as the conductors are strung. ▪ Conduct quarterly inspections of all overhead sections of the medium voltage power lines as well as the 132 kV overhead power line to look for bird carcasses and to ensure that BFDs are still intact and functioning correctly. ▪ Any bird fatalities should be recorded as part of the post-construction avifaunal monitoring reports.	Moderate (3)[3]	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Severe				
	Probability	Likely				
	Reversibility	High				
	Irreplaceability	Low				
DECOMMISSIONING PHASE						
The noise and movement associated with the dismantling activities will be a source of disturbance which would lead to the displacement of avifauna from the area.	Status	Negative	Moderate (3)	▪ 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.	Low (4)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	Low				

[3] The moderate impact significance rating is deemed acceptable if all mitigation measures are strictly implemented, therefore a biodiversity offset is not required.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ The recommendations of the Aquatic and Terrestrial Biodiversity specialist studies must be strictly implemented, especially as far as limitation of the activity footprint is concerned.		
CUMULATIVE IMPACTS						
CONSTRUCTION PHASE						
The noise and movement associated with the construction activities of the Renewable Energy Projects and their associated Grid Connections will be a source of disturbance which would lead to the displacement of avifauna from the area.	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Regional Short term Substantial Very likely High Low	Moderate (3)	▪ Construction activity should be restricted to the immediate footprint of the infrastructure as far as possible. Access to the remainder of the area should be strictly controlled to prevent unnecessary disturbance of priority species. ▪ Removal of vegetation must be restricted to a minimum and must be rehabilitated to its former state where possible after construction. ▪ Construction of new roads should only be considered if existing roads cannot be upgraded. ▪ Measures to control noise and dust should be applied according to current best practice in the industry. ▪ All the buffer zones as recommended by the various Avifaunal Specialist Studies must be adhered to.	Low (4)	High
Total or partial displacement of avifauna due to habitat transformation associated with the construction and presence of the of the Renewable Energy Projects and their associated Grid Connections.	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Regional Long term Substantial Very Likely Moderate Moderate	Moderate (3)	▪ Vehicle and pedestrian access to the site should be controlled and restricted to the construction footprint to prevent unnecessary destruction of vegetation. ▪ Vegetation clearance must be limited to what is absolutely necessary and in adherence to rehabilitation measures. ▪ The mitigation measures put forward by the Aquatic, and Terrestrial Biodiversity Specialists must be strictly implemented, especially as far as limitation of the activity footprint is concerned.	Low (4)	Medium
OPERATIONAL PHASE						
Mortality of avifauna due to collisions with the wind turbines.	Status Spatial Extent Duration	Negative Regional Long term	High (2)	▪ No turbines should be located in avifaunal buffer zones as indicated by the avifaunal specialist.	Moderate (3)	High

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
	Consequence	Severe		▪ The results of the pre-construction monitoring must guide the layout of the turbines, especially as far as proposed no-turbine zones are concerned. No turbines must be constructed in the buffer zones which were identified based on the results of the pre-construction monitoring, with a specific view to limiting the risk of collisions to a variety of birds, including several Red Data species. Note that the current layout has taken these buffer zones into consideration. ▪ Formal live-bird monitoring should be in the operational phase, as per the most recent edition of the Best Practice Guidelines at the time (Jenkins et al. 2015) to assess collision rates. ▪ If fatality numbers exceed annual thresholds, additional mitigation measures must be implemented as part of the adaptive management strategy. The choice of additional mitigation measures will be dependent on the measures in place at the time and could involve the implementation of SDoD measures or selective curtailment of specific turbines during high-risk periods.		
	Probability	Very Likely				
	Reversibility	Low				
	Irreplaceability	Moderate				
Electrocutions of avifauna on the internal 33 kV networks and/or in the substations.	Status	Negative	Moderate (3)	▪ Use underground cabling for the medium voltage networks as much as is practically possible. ▪ Monitor the electrocution mortality in the substations monthly. Apply mitigation (insulation of live components) if electrocution of SCC happens more than once per annum. ▪ Where the use of overhead lines is unavoidable due to technical reasons or to accommodate other environmental sensitivities (specifically aquatic ecology), the avifaunal specialist must be consulted to ensure that a bird-friendly pylon design is used, and that appropriate mitigation is implemented pro-actively for complicated pylon structures e.g., insulation of live components to prevent electrocutions on terminal structures and pole transformers. A registered SACNASP Avifaunal Specialist must sign off on the design for the pylons and overhead lines.	Low (4)	High
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Severe				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Low				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Anti-perching devices to be installed on all overhead 33 kV pylons to deter birds.		
Collision mortality of power line sensitive avifauna due to collisions with internal medium voltage overhead lines and/or the high voltage 132 kV power lines (grid connections).	Status	Negative	High (2)	▪ Phosphorescent-type Bird Flight Diverters must be fitted in a staggered configuration (on the earth wire and conductor) to all overhead lines for the full length according to the applicable Eskom Engineering Instruction – 5 m apart for medium voltage power lines and 15 m apart for high voltage power lines.	Moderate (3)	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Severe				
	Probability	Likely				
	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)	▪ 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. ▪ The recommendations of the Aquatic and Terrestrial Biodiversity specialist studies must be strictly implemented, especially as far as limitation of the activity footprint is concerned.	Low (4)	High
	Spatial Extent	Site specific				
	Duration	Short term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	Low				

6.2.5 Visual Impacts

Impact Assessment:

The following potential visual impacts were identified that are likely to be associated with the proposed development:

Direct Impacts:

Construction Phase:

- Visual impact of construction activities on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF.
- Visual impact of construction activities on observers travelling along roads within 5 km of the proposed WEF.

Operational Phase:

- Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF.
- Visual impact on observers travelling along the roads within 5 km of the proposed WEF.
- Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5-10 km of the proposed WEF.
- Visual impact on observers travelling along roads within 5-10 km of the proposed WEF.
- Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 10-20 km of the proposed WEF.
- Visual impact on observers travelling along roads within 10 – 20 km of the proposed WEF.
- Visual impact on residents of homesteads and visitors to tourist accommodation (if present) located beyond the 20 km radius of the proposed WEF.
- Visual impact on visitors to the formally protected Karoo National Park located beyond 20 km of the proposed WEF.
- Visual impact of shadow flicker on sensitive visual receptors in close proximity to the proposed WEF.
- Visual impact of lighting at night on residents and visitors to homesteads and tourist accommodation within 10 km of the proposed WEF.
- Visual impact of lighting at night on observers travelling along roads within 10 km of the proposed WEF.
- Visual impact of the ancillary infrastructure on observers in close proximity to the structures.
- Visual impact of blade painting on the overall perception of the WEF by sensitive receptors especially within 0-5 km and potentially up to 10 km radius of the wind turbine structures.

Decommissioning Phase:

- Visual impact of decommissioning activities on sensitive visual receptors within 5 km of the proposed WEF.

Indirect Impacts:

Operational Phase:

- The potential impact on the sense of place of the region.

Cumulative Impact Assessment:

The following cumulative impact was identified in the Visual Impact Assessment:

- The potential cumulative visual impact of wind farms, solar farms and EGI on the visual quality of the landscape.

The study area is considered to have a high visual quality owing to the largely undeveloped, natural landscapes and remote location. The area is located adjacent to Beaufort West Renewable Energy Development Zone (REDZ), and as such, a fair number of Renewable Energy Facilities (REFs) can be found within a 50 km radius and beyond. Should the proposed WEF be constructed together with the other proposed developments in the GEED Beaufort West Renewable Energy Cluster, visual receptors will most likely experience them as one facility and will be exposed to wind turbines in multiple directions. This also applies to all other authorised and in-progress REFs within the 50 km radius, should they be constructed. Based on this, it is expected that the addition of the proposed WEF, and the other proposed developments in the GEED Beaufort West Renewable Energy Cluster, will exacerbate the cumulative impact likely to be experienced within 50 km in the region.

In light of this, and the generally remote location of the site, the vast number of other authorised REFs and its proximity to the Beaufort West REDZ, the potential cumulative visual impact of the proposed WEF, together with the other authorised WEFs, SEFs and EGI within a 50 km radius is expected to be very high, depending on the observer's sensitivity to wind turbine structures. While the visual quality of the landscape is considered high and taking into consideration the potential visual impacts on sensitive visual receptors, the cumulative visual impact is considered to be within acceptable limits owing to its location adjacent to the Beaufort West REDZ and the vast number of other REFs and EGI already authorised in the region. The cumulative impact is not considered a fatal flaw as the addition of the proposed WEF is not expected to contribute to the cumulative visual impact significantly.

Visual Impact Assessment Methodology:

The Visual Impact Assessment rating methodology utilised by the Visual Specialists differs from the qualitative approach prescribed by Environmental Assessment Practitioner (EAP). This is primarily due to the primary objective of the Visual Impact Assessment, which is to anticipate and, where possible, quantify the extent of visual impacts in a transparent and unbiased manner. This requires the application of defined criteria and spatial analyses, which collectively inform the determination of impact magnitude and the subsequent evaluation of overall significance. The methodology adopted by the Visual Specialists is designed to remain objective, avoiding reliance on emotive or subjective interpretation, as far as possible. In recognition of the inherently perceptual nature of visual impacts, the VIA incorporates criteria not typically relevant to biophysical assessments. These include:

- Magnitude – the extent and intensity of visual alteration introduced by the proposed development.
- Visual receptor sensitivity – the degree to which individuals or groups of observers are likely to perceive and respond to the change.
- Landscape character sensitivity – the inherent capacity of the receiving landscape to absorb, accommodate, or resist visual change.

The inclusion of these additional criteria acknowledges that visual impacts are ultimately shaped by observer-based value judgements. For example, a development such as a WEF may be regarded positively, neutrally, or negatively depending on the perception of the receptor. Similarly, the ability of the receiving landscape to accommodate change plays a critical role in determining the overall significance of the impact. Receptor sensitivity and landscape character sensitivity are therefore central to ensuring that the Visual Impact Assessment process is as reasoned, consistent, and objective as possible, and therefore cannot be excluded.

Based on the above, the Visual Specialists used the following impact rating methodology in the Visual Impact Assessment, which states the nature of the potential visual impact (e.g. the visual impact on users of major roads in the vicinity of the proposed infrastructure) and includes a table quantifying the potential visual impact according to the following criteria:

Criteria	Ratings
Extent - How far the visual impact is going to extend and to what extent it will have the highest impact. In the case of this type of development the extent of the visual impact is most likely to have a higher impact on receptors closer to the development and decrease as the distance increases.	• (1) Very low: Long distance > 20km • (2) Low: Medium to long distance between 10 – 20km • (3) Medium: Short distance between 5 – 10km • (4) High: Very short distance < 5km • (5) Very high: ***Site*** specific, within the development site only
Duration - The timeframe in both the construction and operational phase over which the effects of the impact will be felt.	• (1) Very short: 0-1 years • (2) Short: 2-5 years • (3) Medium: 5-15 years • (4) Long: >15 years • (5) Permanent
Magnitude - The severity or size of the impact. This value is read off the Visual Impact Index maps. Where more than one value is applicable, the higher of these will be used as a worst-case scenario.	• (2) Negligible • (4) Low • (6) Moderate • (8) High • (10) Very High
Receptor Sensitivity – the sensitivity of visual receptors based on location, susceptibility and value etc to change (of the landscape).	• (2) Negligible • (4) Low • (6) Moderate • (8) High • (10) Very High
Landscape Character – the quality of the landscape in terms of its particular characteristics.	• (2) Negligible • (4) Low • (6) Moderate • (8) High • (10) Very High
Probability - The likelihood of the impact occurring.	• (1) Very improbable: Less than 20% sure of the likelihood of an impact occurring • (2) Improbable: 20-40% sure of the likelihood of an impact occurring • (3) Probable: 40-60% sure of the likelihood of an impact occurring • (4) Highly probable: 60-80% sure of the likelihood of that impact occurring

Criteria	Ratings
	• (5) Definite: More than 80% sure of the likelihood of that impact occurring
Significance - The significance weighting for each potential visual impact (as calculated above) is as follows:	• ***(0-12) Negligible:*** Where the impact would have no direct influence on the decision to develop in the area. The impact would be of a very low order. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap, and simple. • ***(13-30) Low:*** Where the impact would have a very limited direct influence on the decision to develop in the area. The impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved or little would be required, or both. • ***(31-60) Moderate:*** Where the impact could influence the decision to develop in the area. The impact would be real but not substantial. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible. • ***(61-80) High:*** Where the impact must have an influence on the decision to develop in the area. The impacts are of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. • ***(81-100) Very High:*** Where the impact will definitely have an influence on the decision to develop in the area. The impacts are of the highest order possible. In the case of negative impacts, there would be no possible mitigation and / or remedial activity possible.
The **significance** of the potential visual impact:	• This is equal to the **consequence** multiplied by the **probability** of the impact occurring, where the consequence is determined by the sum of the individual scores for magnitude, duration, extent, receptor sensitivity and landscape character divided by two (2).
Status – The perception of Interested and Affected Parties towards the proposed development.	• Positive • Negative • Neutral
Reversibility – The possibility of visual recovery of the impact following the decommissioning of the proposed development	• (1) Reversible • (3) Recoverable • (5) Irreversible

Concluding Statement:

The Visual Impact Assessment cannot categorically state that any of the criteria that determines whether a visual impact constitutes a potential fatal flaw were transgressed. As such the identified potential visual impacts are not considered to be fatal flaws for a development of this nature. Therefore, the Visual Specialist is of the opinion that the visual impacts associated with the proposed WEF are within acceptable limits when considering the nature of the proposed infrastructure from a visual perspective and can be authorised.

Refer to the Visual Impact Assessment in Appendix G.5 of this EIA Report for detailed information on the potential impacts identified and mitigation measures recommended. The table below provides a summary of the impact assessment for this study.

Table 6.7: Impact assessment of the potential visual risks and impacts of the proposed project.

Nature of Impact	Impact Criteria	Impact Assessment Without Mitigation	Impact Assessment With Mitigation	Mitigation measures	Residual Impacts
DIRECT IMPACTS - CONSTRUCTION PHASE					
Visual impact of construction activities on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF.	Extent	Very short distance **(4)**	Very short distance **(4)**	Planning: ▪ Retain and maintain natural vegetation in all areas outside of the development footprint, but within the project site. ▪ Existing roads should be utilised wherever possible. New roads should be planned taking due cognisance of the topography to limit cut and fill requirements. Construction/upgrade of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. ▪ In terms of onsite ancillary buildings and structures, it is recommended that it be planned so that the clearing of vegetation is minimised. This implies consolidating this infrastructure as much as possible and making use of already disturbed areas rather than undisturbed sites wherever possible. Construction: ▪ Ensure that vegetation is not unnecessarily cleared or removed during the construction period. ▪ Reduce the construction period through careful logistical planning and productive implementation of resources. ▪ Ensure that the placement of laydown areas and any potential temporary construction camps are within the areas planned in order to minimise vegetation clearing (i.e. in already disturbed areas). ▪ Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. ▪ Ensure that rubble, litter, and disused construction materials are appropriately stored and then disposed of regularly at licensed waste facilities. ▪ Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).	None, provided that rehabilitation works are carried out as required.
	Duration	Short term **(2)**	Short term **(2)**		
	Magnitude	Very high **(10)**	High **(8)**		
	Receptor sensitivity	Very high **(10)**	Very high **(10)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Definite **(5)**	Highly Probable **(4)**		
	Significance	**Very high (85)**	**High (64)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	Yes	Yes		

Nature of Impact	Impact Criteria	Impact Assessment Without Mitigation	Impact Assessment With Mitigation	Mitigation measures	Residual Impacts
				▪ Restrict construction activities to daylight hours whenever possible in order to reduce the visual impacts associated with lighting. ▪ Rehabilitate all disturbed areas immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.	
Visual impact of construction activities on observers travelling along roads within 5 km of the proposed WEF.	Extent	Very short distance **(4)**	Very short distance **(4)**	<u>Planning:</u> ▪ Retain and maintain natural vegetation in all areas outside of the development footprint, but within the project site. ▪ Existing roads should be utilised wherever possible. New roads should be planned taking due cognisance of the topography to limit cut and fill requirements. Construction/upgrade of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. ▪ In terms of onsite ancillary buildings and structures, it is recommended that it be planned so that the clearing of vegetation is minimised. This implies consolidating this infrastructure as much as possible and making use of already disturbed areas rather than undisturbed sites wherever possible. <u>Construction:</u> ▪ Ensure that vegetation is not unnecessarily cleared or removed during the construction period. ▪ Ensure that the placement of laydown areas and any potential temporary construction camps are within the areas planned in order to minimise vegetation clearing (i.e. in already disturbed areas). ▪ Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. ▪ Ensure that rubble, litter, and disused construction materials are appropriately stored and then disposed of regularly at licensed waste facilities. ▪ Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).	None, provided that rehabilitation works are carried out as required.
	Duration	Short term **(2)**	Short term **(2)**		
	Magnitude	Very high **(10)**	High **(8)**		
	Receptor sensitivity	Moderate **(6)**	Moderate **(6)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Definite **(5)**	Highly probable **(4)**		
	Significance	**High (75)**	**Moderate (56)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	Yes	Yes		

Nature of Impact	Impact Criteria	Impact Assessment Without Mitigation	Impact Assessment With Mitigation	Mitigation measures	Residual Impacts
				▪ Restrict construction activities to daylight hours whenever possible in order to reduce the visual impacts associated with lighting. ▪ Rehabilitate all disturbed areas immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.	
DIRECT IMPACTS - OPERATIONAL PHASE					
Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF.	Extent	Very short distance **(4)**	Very short distance **(4)**	***Generic best practise mitigation/management measures:*** <u>Planning:</u> ▪ Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. ▪ Existing roads should be utilised wherever possible. New roads should be planned taking due cognisance of the topography to limit cut and fill requirements. Construction/upgrade of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. ▪ In terms of onsite ancillary buildings and structures, it is recommended that it be planned so that the clearing of vegetation is minimised. This implies consolidating this infrastructure as much as possible and making use of already disturbed areas rather than undisturbed sites wherever possible. <u>Operations:</u> ▪ Ensure that the maintenance of the turbines and ancillary structures and infrastructure must be undertaken to ensure that the facility does not degrade, therefore aggravating the visual impact. ▪ Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as a when required. ▪ Monitor rehabilitated areas for rehabilitation failure or concerns and implement remedial action as and when required.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	Very high **(10)**	Very high **(10)**		
	Receptor sensitivity	Very high **(10)**	Very high **(10)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Definite **(5)**	Definite **(5)**		
	Significance	**Very High (90)**	**Very High (90)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	No	No		

Nature of Impact	Impact Criteria	Impact Assessment Without Mitigation	Impact Assessment With Mitigation	Mitigation measures	Residual Impacts
				Decommissioning: ▪ Remove infrastructure not required for the post-decommissioning use. ▪ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.	
Visual impact on observers travelling along the roads within 5 km of the proposed WEF.	Extent	Very short distance **(4)**	Very short distance **(4)**	▪ The generic best practice mitigation / management measures identified above (for the following operational phase direct impact *Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF*) applies here to this impact.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	Very high **(10)**	Very high **(10)**		
	Receptor sensitivity	Moderate **(6)**	Moderate **(6)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Definite **(5)**	Definite **(5)**		
	Significance	**High (80)**	**High (80)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	No	No		
Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5-10 km of the proposed WEF.	Extent	Short distance **(3)**	Short distance **(3)**	▪ The generic best practice mitigation / management measures identified above (for the following operational phase direct impact *Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF*) applies here to this impact.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	High **(8)**	High **(8)**		
	Receptor sensitivity	Very High **(10)**	Very High **(10)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Definite **(5)**	Definite **(5)**		
	Significance	**Very High (82)**	**Very High (82)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	No	No		
Visual impact on observers travelling along roads within 5-10 km of the proposed WEF.	Extent	Short distance **(3)**	Short distance **(3)**	▪ The generic best practice mitigation / management measures identified above (for the following operational phase direct impact *Visual impact on residents of homesteads and visitors to tourist accommodation (if*	The visual impact will be removed after decommissioning, provided the WEF infrastructure is
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	High **(8)**	High **(8)**		
	Receptor sensitivity	Moderate **(6)**	Moderate **(6)**		
	Landscape character	High **(8)**	High **(8)**		

Nature of Impact	Impact Criteria	Impact Assessment Without Mitigation	Impact Assessment With Mitigation	Mitigation measures	Residual Impacts
	Probability	Definite **(5)**	Definite **(5)**	*present) within 5 km of the proposed WEF*) applies here to this impact.	removed and the area rehabilitated. Failing this, the visual impact will remain.
	Significance	**High (72)**	**High (72)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	No	No		
Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 10-20 km of the proposed WEF.	Extent	Medium distance **(2)**	Medium distance **(2)**	▪ The generic best practice mitigation / management measures identified above (for the following operational phase direct impact *Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF*) applies here to this impact.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	Moderate **(6)**	Moderate **(6)**		
	Receptor sensitivity	High **(8)**	High **(8)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Probable **(3)**	Probable **(3)**		
	Significance	**Moderate (42)**	**Moderate (42)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	No	No		
Visual impact on observers travelling along roads within 10 – 20 km of the proposed WEF.	Extent	Medium distance **(2)**	Medium distance **(2)**	▪ The generic best practice mitigation / management measures identified above (for the following operational phase direct impact *Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF*) applies here to this impact.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	Moderate **(6)**	Moderate **(6)**		
	Receptor sensitivity	Moderate **(6)**	Moderate **(6)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Probable **(3)**	Probable **(3)**		
	Significance	**Moderate (39)**	**Moderate (39)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	No	No		

Nature of Impact	Impact Criteria	Impact Assessment Without Mitigation	Impact Assessment With Mitigation	Mitigation measures	Residual Impacts
Visual impact on residents of homesteads and visitors to tourist accommodation (if present) located beyond the 20 km radius of the proposed WEF.	Extent	Long distance **(1)**	Long distance **(1)**	▪ The generic best practice mitigation / management measures identified above (for the following operational phase direct impact *Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF*) applies here to this impact.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	Low **(4)**	Low **(4)**		
	Receptor sensitivity	Moderate **(6)**	Moderate **(6)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Improbable **(2)**	Improbable **(2)**		
	Significance	**Low (23)**	**Low (23)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	No	No		
Visual impact on visitors to the formally protected Karoo National Park located beyond 20 km of the proposed WEF.	Extent	Long distance **(1)**	Long distance **(1)**	▪ The generic best practice mitigation / management measures identified above (for the following operational phase direct impact *Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF*) applies here to this impact.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	Low **(4)**	Low **(4)**		
	Receptor sensitivity	Very High **(10)**	Very High **(10)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Very Improbable **(1)**	Very Improbable **(1)**		
	Significance	**Low (14)**	**Low (14)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	No	No		
Visual impact of shadow flicker on sensitive visual receptors in close proximity to the proposed WEF.	Extent	Very Short distance **(4)**	Very Short distance **(4)**	***Generic best practise mitigation/management measures:*** <u>Planning:</u> ▪ Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. ▪ It is recommended that no turbines should be placed within 1km of any homesteads, unless otherwise agreed upon by the affected landowner, even if the landowner is	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	Moderate **(6)**	Low **(4)**		
	Receptor sensitivity	Very High **(10)**	Very High **(10)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Highly probable **(4)**	Very improbable **(1)**		
	Significance	**High (64)**	**Low (15)**		
	Status (positive or negative)	Negative	Negative		

Nature of Impact	Impact Criteria	Impact Assessment Without Mitigation	Impact Assessment With Mitigation	Mitigation measures	Residual Impacts
	Reversibility	Reversible **(1)**	Reversible **(1)**	located within the development site. Proof of such agreement is required. Operations: ▪ Consider planting of screening vegetation at the affected homestead to limit the effect of shadow flicker, should it be required. Decommissioning: ▪ Remove infrastructure not required for the post-decommissioning use. ▪ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.	
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	Yes	Yes		
Visual impact of lighting at night on residents and visitors to homesteads and tourist accommodation within 10 km of the proposed WEF	Extent	Short distance **(3)**	Short distance **(3)**	***Generic best practise mitigation/management measures:*** Planning & operation: ▪ Implement needs-based night lighting if available and considered acceptable by the CAA. ▪ Limit aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact. ▪ Shield the sources of light by physical barriers (walls, vegetation, or the structure itself). ▪ Limit mounting heights of lighting fixtures or alternatively use footlights or bollard level lights. ▪ Make use of minimum lumen or wattage in fixtures. ▪ Make use of down-lighters or shielded fixtures. ▪ Make use of Low-Pressure Sodium lighting or other types of low impact lighting. ▪ Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes. Decommissioning: ▪ Remove infrastructure not required for the post-decommissioning use. ▪ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	Very High **(10)**	High **(8)**		
	Receptor sensitivity	Very High **(10)**	Very High **(10)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Definite **(5)**	Highly probable **(4)**		
	Significance	**Very high (88)**	**High (66)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	Yes	Yes		

Nature of Impact	Impact Criteria	Impact Assessment Without Mitigation	Impact Assessment With Mitigation	Mitigation measures	Residual Impacts
Visual impact of lighting at night on observers travelling along roads within 10 km of the proposed WEF	Extent	Short distance **(3)**	Short distance **(3)**	***Generic best practise mitigation/management measures:*** <u>Planning & operation</u>: ▪ Implement needs-based night lighting if available and considered acceptable by the CAA. ▪ Limit aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact. ▪ Shield the sources of light by physical barriers (walls, vegetation, or the structure itself). ▪ Limit mounting heights of lighting fixtures or alternatively use footlights or bollard level lights. ▪ Make use of minimum lumen or wattage in fixtures. ▪ Make use of down-lighters or shielded fixtures. ▪ Make use of Low-Pressure Sodium lighting or other types of low impact lighting. ▪ Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes. <u>Decommissioning:</u> ▪ Remove infrastructure not required for the post-decommissioning use. ▪ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	Very High **(10)**	High **(8)**		
	Receptor sensitivity	Moderate **(6)**	Moderate **(6)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Highly Probable **(4)**	Probable **(3)**		
	Significance	**High (62)**	**Moderate (44)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	Yes	Yes		
Visual impact of the ancillary infrastructure on observers in close proximity to the structures.	Extent	Short distance **(3)**	Short distance **(3)**	▪ The generic best practice mitigation / management measures identified above (for the following operational phase direct impact *Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF*) applies here to this impact.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	High **(8)**	Moderate **(6)**		
	Receptor sensitivity	Very High **(10)**	Very High **(10)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Highly probable **(4)**	Probable **(3)**		
	Significance	**High (68)**	**Moderate (48)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		

Nature of Impact	Impact Criteria	Impact Assessment Without Mitigation	Impact Assessment With Mitigation	Mitigation measures	Residual Impacts
	Can impacts be mitigated?	Yes	Yes		
Visual impact of blade painting on the overall perception of the WEF by sensitive receptors especially within 0-5 km and potentially up to 10 km radius of the wind turbine structures.	Extent	Very short distance **(4)**	Very Short distance **(4)**	***Generic best practise mitigation/management measures:*** <u>Planning:</u> ▪ Apply blade painting only where justified by avifaunal risk assessments and in accordance with SACAA-approved patterns and the SAWEA/BLSA/BARESG guidelines. ▪ As far as possible, limit blade painting to one blade per turbine or simple broad bands (e.g., two broad stripes or ¾ solid blade) rather than multiple thin stripes to reduce visual clutter. If multiple blades are patterned, use asymmetrical placement to preserve avian conspicuity without repeating pattern symmetry that increases human noticeability. ▪ Commit to consistent pattern application across the facility (or defined subsets) to avoid patchwork appearance and public confusion. ▪ Prioritise painting on turbines located in low-sensitivity visual zones (i.e. behind ridgelines, out of primary viewer corridors) and avoid (or apply minimal treatment to) turbines sited on visually exposed ridgelines or within close proximity (<1–2 km) to sensitive receptors unless avifaunal risk compels it. ▪ Specify durable, non-reflective paints formulated for turbine use (UV-stable, abrasion resistant) to avoid patchiness, gloss/shine changes or uneven weathering that would attract visual attention. ▪ Ensure the application of blade painting is undertaken during the manufacturing process and not as an after application during the construction phase. ▪ Apply paint under controlled conditions with trained applicators, measured coverage, documented pattern placement, to ensure uniform visual appearance across turbines and avoid visible inconsistencies. <u>Construction:</u> ▪ Apply paint patterns uniformly and consistently across turbines to avoid irregular visual effects.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	Low **(4)**	Low **(4)**		
	Receptor sensitivity	Very High **(10)**	Very high **(10)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Improbable **(2)**	Improbable **(2)**		
	Significance	**Low (30)**	**Low (30)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	No	No		

Nature of Impact	Impact Criteria	Impact Assessment Without Mitigation	Impact Assessment With Mitigation	Mitigation measures	Residual Impacts
				▪ Use non-reflective, durable paint finishes to prevent glare, fading, or patchiness that may increase visibility. <u>Operations:</u> ▪ Implement post-construction monitoring to evaluate both avifaunal effectiveness and public perception of painted blades. It is suggested that this is implemented via two complementary monitoring programmes: (a) avifaunal collision monitoring to quantify mortality reduction (as specified by the avifaunal specialist), and (b) visual perception monitoring (stakeholder surveys/photo points) to assess community responses and any unforeseen visual intrusion. Use agreed metrics (e.g., raptor fatalities, local resident perception scores). ▪ Use monitoring results to adjust paint coverage (e.g., reduce/alter patterns where visual impacts are unacceptable or expand where avifaunal benefit is insufficient). Maintain decision-making records (trigger thresholds, remedial actions). ▪ Schedule periodic repainting to maintain uniform colour/contrast and avoid patchy or faded blades that increase attention. Use non-gloss finishes to avoid glare. ▪ Keep local communities and stakeholders informed of monitoring outcomes and any planned adjustments to painting strategy to maintain public confidence and transparency. <u>Decommissioning:</u> ▪ Remove infrastructure not required for the post-decommissioning use. ▪ Restore the site to pre-construction conditions, ensuring no residual long-term visual impacts linked to painted blades.	
DIRECT IMPACTS - DECOMMISSIONING PHASE					
Visual impact of decommissioning activities on sensitive visual receptors within 5 km of the proposed WEF.	Extent	Very short distance **(4)**	Very short distance **(4)**	▪ Reduce the decommissioning period through careful logistical planning and productive implementation of resources.	None, provided that rehabilitation works are carried out as required.
	Duration	Very short term **(1)**	Very short term **(1)**		
	Magnitude	High **(8)**	Moderate **(6)**		
	Receptor sensitivity	Very high **(10)**	Very high **(10)**		
	Landscape character	High **(8)**	High **(8)**		

Nature of Impact	Impact Criteria	Impact Assessment Without Mitigation	Impact Assessment With Mitigation	Mitigation measures	Residual Impacts
	Probability	Highly Probable **(4)**	Probable **(3)**	▪ Plan the placement of laydown areas and temporary equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) where possible. ▪ Restrict the activities and movement of workers and vehicles to the immediate site and existing access roads. ▪ Ensure that rubble, litter, and disused materials are appropriately stored and then disposed of regularly at licensed waste facilities. ▪ Reduce and control dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent). ▪ Restrict activities to daylight hours whenever possible in order to reduce the visual impacts associated with lighting. ▪ Remove infrastructure not required for the post-decommissioning use of the site. ▪ Rehabilitate all areas as per the rehabilitation plan undertaken. Consult an ecologist regarding rehabilitation specifications. ▪ Monitor rehabilitated areas post-decommissioning and implement remedial actions as required.	
	Significance	**High (62)**	**Moderate (44)**		
	Status (positive or negative)	Positive	Positive		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	Yes	Yes		
INDIRECT IMPACTS - OPERATIONAL PHASE					
The potential impact on the sense of place of the region.	Extent	Long distance **(1)**	Long distance **(1)**	▪ The generic best practice mitigation / management measures identified above (for the following operational phase direct impact *Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF*) applies here to this impact.	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	Very High **(10)**	Very High **(10)**		
	Receptor sensitivity	Very high **(10)**	Very high **(10)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Definite **(5)**	Definite **(5)**		
	Significance	**Very High (82)**	**Very High (82)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	No, only best practise measures can be implemented	No, only best practise measures can be implemented		

Table 6.8: Cumulative impact assessment of the potential visual risks and impacts of the proposed project.

Nature of Impact	Impact Criteria	Overall impact of the proposed Eland WEF in isolation	Cumulative impact of renewable projects within 50km radius	Mitigation measures	Residual Impacts
CUMULATIVE IMPACTS - OPERATIONAL PHASE					
The potential cumulative visual impact of wind farms, solar farms and EGI on the visual quality of the landscape.	Extent	Medium distance **(2)**	Medium distance **(2)**	▪ Not Applicable	The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
	Duration	Long term **(4)**	Long term **(4)**		
	Magnitude	High **(8)**	Very high **(10)**		
	Receptor sensitivity	Very high **(10)**	Very high **(10)**		
	Landscape character	High **(8)**	High **(8)**		
	Probability	Highly probable **(4)**	Definite **(5)**		
	Significance	**High (64)**	**Very High (85)**		
	Status (positive or negative)	Negative	Negative		
	Reversibility	Reversible **(1)**	Reversible **(1)**		
	Irreplaceable loss of resources?	No	No		
	Can impacts be mitigated?	No	No		

6.2.6 Heritage (including Archaeology and Cultural Landscape)

The Heritage Impact Assessment is an integrated report that addresses Archaeology, Palaeontology, Cultural Landscape and Visual. The Palaeontology and Visual Impacts in the integrated Heritage Impact Assessment are based on the Palaeontology and Visual Impact Assessments undertaken for the proposed projects, described separately in this chapter. These have not been repeated in this section.

Impact Assessment:

The following potential heritage impacts were identified that are likely to be associated with the proposed development:

Construction Phase:

- **Loss of archaeological sites and material**: Activities, such as earthworks and excavations, during the construction of the WEF may encounter and disturb archaeological material.
- **Damage to or loss of packed stone structures and kraals:** The construction of the access road to the WTGs 1-11 will have a direct impact on two of the historical walls around the Donkergat farm werf. Between 10 and 15 m of wall JG009, and roughly 50 m of wall JG024, will need to be removed to accommodate the increased width and new alignment of the existing farm road required for the construction of the WEF.
- **Impacts to the cultural landscape**: The construction of the WEF will introduce an industrial element into the landscape which will alter its character and sense of place.

Operational Phase:

- **Impacts to the cultural landscape**: The construction of the WEF will introduce an industrial element into the landscape which will alter its character and sense of place. Visual intrusion, especially within a 5-10 km radius, and potentially up to 20 km, created by the wind turbines will be the predominant form of impact on the cultural landscape of the area and can be anticipated for the operational lifespan of the facility (i.e. 20-25 years).

Decommissioning Phase:

- **Loss of archaeological sites and material**: Decommissioning activities may encounter and disturb archaeological material.
- **Impacts to the cultural landscape**: The decommissioning of the WEF will introduce an industrial element into the landscape which will alter its character and sense of place.

Cumulative Impact Assessment:

- **Construction and Operational Phases:** Potential impacts on archaeology and cultural heritage resources.

It is important to note that even though the impacts on archaeological sites and material during construction are rated as negative, the avoidance of significant identified sites and, where this is not possible, the recording and/or recovery, and curation of such material in a suitable institution would represent positive outcomes and would enhance the regional archaeological database and contribute to the broader scientific understanding of South Africa's heritage.

Concluding Statement:

The Heritage Impact Assessment found that the area identified for the proposed WEF is a heritage environment of variable sensitivity but that significant impacts on heritage resources arising from the construction of the project are unlikely. Provided the recommended mitigation measures are implemented, the overall impact and significance of the proposed WEF on heritage resources will be low and the proposed activity is acceptable.

It is the specialists' reasoned opinion that the proposed WEF and associated infrastructure be granted EA. The mitigation measures contained in Section 13 of the Heritage Impact Assessment are recommended for inclusion in the EA.

Refer to the Heritage Impact Assessment in Appendix G.6 of this EIA Report for detailed information on the potential impacts identified and mitigation measures recommended. The table below provides a summary of the impact assessment for this study.

Table 6.9: Impact assessment of the potential heritage risks and impacts of the proposed project.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Ranking (Post-mitigation)	Confidence Level
DIRECT IMPACTS						
CONSTRUCTION PHASE						
Loss of archaeological sites and material	Status	Negative	Very Low (5)	▪ A pre-construction archaeological walkover survey of the final WEF layout. ▪ Finds of archaeological material are reported to HWC (and SAHRA where applicable) and the project archaeologist.	Very Low (5)	High
	Spatial Extent	Site specific				
	Duration	Permanent				
	Consequence	Slight				
	Probability	Likely				
	Reversibility	Non-reversible				
	Irreplaceability	High				
Damage to or loss of packed stone structures and kraals	Status	Negative	Very Low (5)	▪ Walls to be demolished are photographically recorded before demolition. ▪ No-go areas implemented around certain stone features.	Very Low (5)	High
	Spatial Extent	Site specific				
	Duration	Permanent				
	Consequence	Slight				
	Probability	Very Likely				
	Reversibility	Non-reversible				
	Irreplaceability	High				
Impacts to the cultural landscape	Status	Negative	High (2)	▪ Implementation of recommendations of the VIA to reduce impacts to the cultural landscape.	Moderate (3)	High
	Spatial Extent	Local (<10 km from site)				
	Duration	Long term				
	Consequence	Severe				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	High				
OPERATIONAL PHASE						
Impacts to the cultural landscape	Status	Negative	High (2)	▪ Implementation of recommendations of the VIA to reduce impacts to the cultural landscape.	Moderate (3)	High
	Spatial Extent	Local (<10 km from site)				
	Duration	Long term				
	Consequence	Severe				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Ranking (Post-mitigation)	Confidence Level
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	High				
DECOMMISSIONING PHASE						
Loss of archaeological sites and material	Status	Negative	Very Low (5)	▪ Finds of archaeological material are reported to HWC (and SAHRA where applicable) and the project archaeologist.	Very Low (5)	High
	Spatial Extent	Site specific				
	Duration	Permanent				
	Consequence	Slight				
	Probability	Likely				
	Reversibility	Non-reversible				
	Irreplaceability	High				
Impacts to the cultural landscape	Status	Negative	High (2)	▪ Implementation of recommendations of the VIA to reduce impacts to the cultural landscape.	Moderate (3)	High
	Spatial Extent	Local (<10 km from site)				
	Duration	Long term				
	Consequence	Severe				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	High				
CUMULATIVE IMPACTS						
CONSTRUCTION AND OPERATIONAL PHASES						
Impacts to archaeology and cultural heritage resources	Status	Negative	Low (4)	▪ Implementation of recommended mitigation individual projects will ensure that cumulative impacts to heritage resources can be managed and mitigated	Low (4)	High
	Spatial Extent	Regional				
	Duration	Permanent				
	Consequence	Moderate				
	Probability	Very Likely				
	Reversibility	High				
	Irreplaceability	High				

6.2.7 Palaeontology

Impact Assessment:

The following potential palaeontology impacts were identified that are likely to be associated with the proposed development:

Construction Phase:

- Loss of fossil heritage.

Operational and Decommissioning Phases:

- No impact on fossil heritage.

Cumulative Impact Assessment:

- **Construction Phase:** Loss of fossil heritage. If all the mitigation measures are carried out, a conservative estimate of the cumulative impacts on fossil heritage will be Low significance (post-mitigation) and fall within acceptable limits for the project.

Concluding Statement:

The proposed project is not fatally flawed from a palaeontological perspective. It is recommended that the proposed project receive EA.

Refer to the Palaeontology Impact Assessment in Appendix G.7 of this EIA Report for detailed information on the potential impacts identified and mitigation measures recommended. The table below provides a summary of the impact assessment for this study.

Table 6.10: Impact assessment of the potential palaeontology risks and impacts of the proposed project.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Ranking (Post-mitigation)	Confidence Level
DIRECT IMPACTS						
CONSTRUCTION PHASE						
Loss of fossil heritage	Status	Negative	Very High (5)	▪ Implement the Chance Find Protocol, as well as the training of accountable supervisory personnel by a qualified palaeontologist.	Low (4)	High
	Spatial Extent	Site specific				
	Duration	Permanent				
	Consequence	Extreme				
	Probability	Very Likely				
	Reversibility	Non-reversable				
	Irreplaceability	Irreplaceable				
CUMULATIVE IMPACTS						
CONSTRUCTION PHASE						
Loss of fossil heritage	Status	Negative	Moderate (3)	▪ Implement the Chance Find Protocol, as well as the training of accountable supervisory personnel by a qualified palaeontologist.	Low (4)	High
	Spatial Extent	Site specific				
	Duration	Permanent				
	Consequence	Substantial				
	Probability	Unlikely				
	Reversibility	Non-reversable				
	Irreplaceability	Irreplaceable				

6.2.8 Socio-Economic

Impact Assessment:

The following potential socio-economic impacts were identified that are likely to be associated with the proposed development:

Construction Phase:

- **Direct Impact: Capital Investment Contributing to the National, Regional and Local Economy**. The construction of proposed project is estimated to involve capital expenditure of around R6.75 billion, of which approximately 40% (R2.7 billion) may be expended in South Africa in line with Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) Bid Window 5 local content requirements. In relation to the national economy, the investment is significant for a single project. At the local scale, it is expected that a considerable proportion of required project services can be sourced locally and regionally, and that construction of the proposed project will thus generate opportunities for local and regional businesses and service providers.

- **Direct Impact: Generation of Employment, Income and Skills.** During the construction phase, the proposed project is expected to create between 250 and 350 direct jobs, of which about 85% will be semi- or unskilled positions likely filled by local labour, providing much-needed employment in an area with high poverty and limited opportunities. These jobs, together with indirect and induced opportunities generated through procurement and multiplier effects, could translate into approximately 6750 temporary jobs nationally, supported by an estimated R42.8 million local wage bill during construction. While those positions will be limited to ~2.5 years, workers can improve their economic prospects in the longer term if they take full advantage of the income, experience and skills transferred to them through the projects

- **Indirect Impact: Social disruption and change in social dynamics.** The proposed project may cause limited social disruption during construction due to the temporary influx of non-local skilled workers and opportunistic jobseekers. Potential risks include competition for unskilled jobs, pressure on housing and services, increased anti-social behaviour, and the spread of communicable diseases. However, these risks are expected to be comparatively low because most semi- and unskilled labour can be sourced locally, nearby towns will dilute the effect of migrants moving into the area, and existing renewable energy projects in the region have already developed local skills. Broader social disruption, such as protests or resistance, tends to occur based on perceived environmental or social project impacts or when communities feel excluded from benefits.

- **Indirect Impact: Reduced quality of life and increased risks due to construction near residences.** Construction of the proposed project may temporarily reduce quality of life for a small number of nearby residents due to noise, dust, littering, and potential security risks. These effects are expected to be limited, as residences are more than 1 km away, no workers will be housed on-site, and standard contractor procedures can manage nuisances and risks.

Operational Phase:

- **Direct Impact: Operational Investment Contributing to the National, Regional and Local Economy.** During operations, the proposed project is expected to contribute around R114 million annually in operational expenditure, providing a reliable long-term contribution to the regional and local economy. While fewer jobs and business opportunities will arise compared to construction, ongoing maintenance and support services will generate sustained benefits, much of which are likely to be captured regionally due to existing renewable energy capacity and compliance with REIPPPP local content requirements.

- **Direct Impact: Generation of employment, income and skills.** The proposed project is expected to create around 35 to 45 long-term operational jobs over its 20-year lifespan, all likely to be filled locally or regionally. Although the number of positions is limited compared to the construction phase, these jobs are sustainable and provide an estimated R2.6 million annual wage bill, contributing to local livelihoods. Additional benefits include lease payments to landowners, offering supplementary income to farmers.

- **Direct Impact: Increased community prosperity through contributions and income from the proposed project.** The proposed project has the potential to significantly improve community prosperity through socio-economic development (SED) and economic development (ED) contributions, and possible community ownership, in line with REIPPPP requirements. Such contributions, typically between 1.5 and 2.5% of project revenue and between 5 to 15% community equity, could support community upliftment projects and a Community Trust. However, risks include unrealistic expectations, poor fund management, rivalry, and corruption. With strong governance, transparent management, and meaningful community engagement, the project could deliver high, long-term socio-economic benefits. If past REIPPPP project requirements do not apply, it is likely that community ownership in the project and SED and ED funding will not be implemented to the same degree as in previous REIPPPP bidding rounds, although some Corporate Social Investment (CSI) is likely. As such, the project would result in some, but lower, socio-economic benefits from SED and ED funding. Without REIPPPP requirements, benefits would be more limited, with only modest contributions through corporate social investment.

Decommissioning Phase:

- **Direct Impact: Reduced employment and funding.** Decommissioning will involve the demolition, salvaging, and removal of the WEF components and the rehabilitation of the site, thereby creating some opportunities in demolition, recycling, and disposal services. However, it will also end project-related employment, community upliftment funding, and dividends to shareholders.

Cumulative Impact Assessment:

- **Stimulation of economic and employment growth.** The cumulative development of the GEED Renewable Energy Cluster (2590 MW), alongside other potential projects within a 30 km radius (~6076 MW), is expected to expend multiple billions of Rand in the national, regional and local economies. The cumulative impact of renewable energy IPPs on the local, regional, and national is highly significant and positive.

- **Increased community prosperity through contributions and income from IPPs and operational spending.** Renewable energy projects contribute significantly to community prosperity through REIPPPP-mandated investments, shareholding dividends, and operational spending. Even if community contributions by future IPPs are lower than those pledged in initial REIPPPP rounds, the cumulative impact in a context of impoverished local communities is highly significant and positive, provided funds are appropriately managed.

Concluding Statement:

The proposed project has acceptable socio-economic impacts and desirable benefits, though careful management of benefits (governance of community funds) is critical. From a socio-economic perspective, the project should be authorised and is preferred to the No-Go alternative.

Refer to the Socio-Economic Impact Assessment in Appendix G.8 of this EIA Report for detailed information on the potential impacts identified and mitigation measures recommended. The table below provides a summary of the impact assessment for this study.

Table 6.11: Impact assessment of the potential socio-economic risks and impacts of the proposed project.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
CONSTRUCTION PHASE						
Direct: Capital investment contributing to the national, regional and local economy	Status	Positive	Moderate (3)	▪ Source as many goods and services as far as possible from the local and regional economy (e.g. use local contractors and accommodation and equipment suppliers as far as possible and purchase perishable goods locally). ▪ Provide suitable on the job skills training to service providers, where possible and practicable (e.g. basic civil skills, basic electrical work, health and safety, etc.). ▪ Develop and implement a fair and transparent procurement policy. ▪ Provide training to staff and service providers on how to position themselves for other employment opportunities once construction ends. Clearly communicate the project duration to staff and communities. ▪ Consult with existing Independent Power Producer (IPP) projects that successfully procure from local Small, Micro and Medium Enterprises (SMMEs) to share learnings, where possible.	Moderate (3)	Medium
	Spatial Extent	Regional				
	Duration	Medium-term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Partially reversible				
	Irreplaceability	n/a				
Direct: Generation of employment, income and skills	Status	Positive	Low (4)	▪ Maximise use of local skills and resources through preferential employment of locals where practicable. ▪ Develop, communicate and implement a fair and transparent labour and recruitment policy. ▪ Ensure diversity and gender equality in recruitment, as far as possible. ▪ Provide training to staff and service providers before and/or during the construction phase. ▪ Provide training to staff and service providers on how to position themselves for other employment opportunities once construction ends.	Moderate (3)	Medium
	Spatial Extent	Regional				
	Duration	Medium-term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	Employment reversible, training irreversible				
	Irreplaceability	n/a				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
Indirect: Social disruption and change in social dynamics	Status	Negative	Moderate (3)	▪ Clearly publicise and implement a recruitment policy. ▪ Work together with impartial local representatives to identify local people during the recruitment process. ▪ Provide transport to site and other incentives to reduce the number of workers accommodated in Engineering, Procurement and Construction (EPC) accommodation to an absolute minimum. ▪ Consult with the municipalities regarding the capacity of existing services and infrastructure (e.g. provision of water, electricity, waste removal, sanitation and housing) to cope with additional workers brought into the area during the construction period. ▪ Consider supporting projects that improve local services and infrastructure and/or deal with social problems or conflicts through the social upliftment programme, if the need arises.	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Medium-term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Partially reversible				
	Irreplaceability	n/a				
Indirect: Reduced quality of life and increased risks due to construction near residences	Status	Negative	Low (4)	▪ Liaise with nearby residents before and during construction to inform them of construction status and discuss safety management measures to reduce security risks. ▪ Maintain a visible security presence on site. ▪ Implement a grievance mechanism during the construction phase. ▪ Communicate and implement a compensation procedure in the event of damages directly linked to the construction. ▪ Control site access. ▪ Provide transportation to site for unskilled workers. ▪ Declare areas outside of the construction site (that are on private land associated with the project) as no-go areas for construction staff. ▪ Erect and regularly inspect a boundary fence. ▪ Regularly inspect the project area and surrounding area for signs of illegal activity. ▪ Regularly clean any litter from the project area and surrounding area.	Very Low (5)	High
	Spatial Extent	Local				
	Duration	Medium-term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	Partially reversible				
	Irreplaceability	n/a				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
OPERATIONAL PHASE						
Direct: Operational investment contributing to the national, regional and local economy	Status	Positive	Low (4)	▪ During operation, as far as practically possible, source goods and services from the local and regional economy (e.g. use local contractors accommodation, and equipment suppliers, as well as purchase perishable goods locally). ▪ Provide suitable training to service providers, where possible and practicable. ▪ Develop and implement a fair and transparent procurement policy.	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	Partially reversible				
	Irreplaceability	n/a				
Direct: Generation of employment, income and skills	Status	Positive	Low (4)	▪ Maximise use of local skills and resources through preferential employment of locals where practicable. ▪ Develop and implement a fair and transparent labour and recruitment policy. ▪ Prolong the operational life of the project as much as possible. ▪ Ensure diversity and gender equality in recruitment, as far as possible. ▪ Provide suitable training to staff and service providers, where possible and practicable. ▪ Provide ancillary training to workers on maximising the use of income and training to further future economic prospects, potentially through projects initiated as part of the social upliftment programme.	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	Employment reversible, training irreversible				
	Irreplaceability	n/a				
Direct: Increased community prosperity through contributions and income from the WEF if the project complies with typical REIPPPP requirements	Status	Positive	Moderate (3)	▪ Regularly engage with community stakeholders to develop meaningful strategies for community development. ▪ Define vision for economic development in consultation with communities. ▪ Develop a Governance Plan with clear governance rules for the Community Trust, including administration and trustee and beneficiary selection. ▪ Ensure that funding requirements for each project are considered into the future so that projects are viable and sustainable.	High (2)	Medium
	Spatial Extent	Regional				
	Duration	Long term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	n/a				
	Irreplaceability	n/a				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Set clear goals for each project and phase out funding once these goals are achieved. ▪ Ensure regular external auditing of the Community Trust as well as supported projects. ▪ Consider auditing projects for several years after funding has ceased to ensure their benefits are sustained.		
Direct: Increased community prosperity through contributions and income from the WEF if typical REIPPPP requirements do not apply	Status	Positive	Low (4)	▪ Regularly engage with community stakeholders to develop meaningful strategies for community development. ▪ Define vision for economic development in consultation with communities. ▪ Ensure that funding requirements for each project are considered into the future so that projects are viable and sustainable. ▪ Set clear goals for each project and phase out funding once these goals are achieved. ▪ Consider auditing projects for several years after funding has ceased to ensure their benefits are sustained.	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	n/a				
	Irreplaceability	n/a				
DECOMMISSIONING PHASE						
Direct: Reduced employment and funding	Status	Negative	Low (4)	▪ Clearly communicate project duration to staff and communities. ▪ Prolong the operational life of the project as much as possible. ▪ Assist with recommendations and referrals where possible. ▪ Assist with the sustainable administration of funds throughout the project lifetime.	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Short-term				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	n/a				
	Irreplaceability	n/a				

6.2.9 Traffic

Impact Assessment:

The following potential traffic impacts were identified that are likely to be associated with the proposed development:

Construction Phase:

- **Increased road incidents**. The increased traffic volumes on the public roads will increase the potential of incidents on the public road network which could result in injuries or fatalities.

- **Road degradation**. The increased traffic volumes on the public roads will increase the potential for localised public road network degradation within the study area.

- **Dust**. The increased traffic volumes on the unpaved public roads will generate more dust. The larger the vehicle, the more dust is likely to be generated. This dust hinders the drivers wishing to over-take without a clear view for over-taking, resulting in drivers taking unnecessary chances, which could result in unfavourable consequences.

- **Exhaust Emissions**. Exhaust emissions from the delivery and construction vehicles related to the development are overcome by ensuring that all vehicles are road worthy. Exhaust emissions are not the same as dust, as exhaust emissions pollute the environment, which affect future generations. Thus, the impact of exhaust emissions from the delivery and construction vehicles to and on the proposed development has more of an impact on the environment and as such needs to be addressed more vigorously.

- **Hydrocarbon spills**. Spills resulting from accidents or breakdown of vehicles, will cause contamination of the surrounding environment.

Operational Phase:

- **Increased road incidents.** During the operational phase of the development, the traffic volumes are considerably less than during the construction phase of the proposed development. However, with additional vehicles on the public road network comes the probability of increased road incidents, which could result in injuries or fatalities.

Decommissioning Phase:

- It is not possible to determine the expected traffic volumes generated during the decommissioning phase. It can be assumed that these volumes will be lower than during the construction phase as much of the infrastructure (e.g., roads, platforms, etc.) could be retained by the landowners. A separate Traffic Impact Assessment should be undertaken for the decommissioning phase since many of the characteristics related to the Traffic Impact Assessment, i.e. access routes, road geometry, traffic volumes, etc., would have changed over the operational life of the development. This will be confirmed before the decommissioning

phase commences. Thus, the impact assessment for the decommissioning phase has not been provided.

Cumulative Impact Assessment:

As a worst-case scenario for the cumulative impact assessment, concurrent construction of all eight proposed developments forming part of the GEED Beaufort West Renewable Energy Cluster and the operation of the three proposed Nuweveld Wind Farms were assumed for evaluation.

The cumulative construction phase assessment includes the simultaneous construction of all renewable facilities on the Northern, Middle, Southern Clusters and associated Grid Connections (subject to an EA) as proposed by GEED, together with the operational phase of the three proposed Nuweveld Wind Farms.

The cumulative operation phase assessment includes the simultaneous operation of all renewable facilities on the Northern, Middle, Southern Clusters and associated Grid Connections (subject to an EA) as proposed by GEED, together with the operational phase of the three proposed Nuweveld Wind Farms. The only traffic associated with the Grid Connections during the operational phase is the line inspection, which does not adversely impact the traffic volumes, and has been excluded from the Traffic Impact Assessment.

Construction Phase:

The maximum cumulative traffic volumes generated on the various roads during the construction phase of the proposed developments and the operational phase of the adjacent Nuweveld Wind Farms, are in the order of:

- **Peak Traffic:** The maximum number of vehicles on any one section of the public road network within a given hour is estimated to be in the order of 108 vehicles per hour.
- **Diurnal Traffic:** The maximum number of vehicles on any one section of the public road network within a given hour is estimated to be in the order of 185 vehicles per hour. Which equates to approximately 1 480 trips, over an eight-hour period.

Operational Phase:

The cumulative traffic volumes generated on the public road network within the study area during the combined operational phase of all eight proposed developments and the operational phase of the adjacent Nuweveld Wind Farms are in the order of:

- **Peak Traffic:** The maximum number of vehicles on any one section of the public road network within a given hour is estimated to be in the order of 34 vehicles per hour.
- **Diurnal Traffic:** The maximum number of vehicles on any one section of the public road network within a given hour is estimated to be in the order of 15 vehicles per hour. This equates to approximately 120 trips, over an eight-hour period.

The Traffic Specialist assessed the cumulative impact of the additional traffic volumes on the surrounding public road network generated by the proposed developments and found the level of service on the public road network to be acceptable.

Concluding Statement:

The proposed development can be approved from a traffic and transportation perspective as there are no constraints or notable impacts that would jeopardise the implementation of the development, subject to the specific requirements included within the Traffic Impact Assessment (Appendix G.9 of this EIA Report).

Refer to the Traffic Impact Assessment in Appendix G.9 of this EIA Report for detailed information on the potential impacts identified and mitigation measures recommended. The table below provides a summary of the impact assessment for this study.

Table 6.12: Impact assessment of the potential traffic risks and impacts of the proposed project.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
CONSTRUCTION PHASE						
Increased Road Incidents	Status	Negative	High (2)	▪ Reduce the number of vehicles on the roads. ▪ Ensure that driver awareness and road safety training is provided. ▪ Post relevant road signage along affected routes. ▪ Create a local WhatsApp Group, notifying local road users of expected deliveries and associated routes. ▪ Schedule deliveries to avoid local congestion. ▪ Drivers to adhere to the speed limit on the public road. ▪ Post the speed limits along the road as approved by the road's authority. ▪ Drivers not complying with speed limits shall be subject to penalties. ▪ Identify alternative routes where possible. ▪ Request the assistance of local law enforcement, as required. ▪ Ensure all vehicles are roadworthy, visible, adequately marked, and operated by an appropriately licenced operator. ▪ A Traffic Management Plan (TMP) is to be compiled once the contractor has been appointed and all the relevant details of the construction process are known. A TMP framework has been compiled for the proposed Northern Cluster (i.e. Eland WEF and Windy Plains WEF) and has been included as an Appendix to the Traffic Impact Assessment. The contractor appointed to construct the proposed development is to use the cluster TMP as a guideline and platform for the compilation of a project specific TMP, once appointed. The TMP must consider all aspects and potential risks relating to the traffic to and on site, including motorised, non-motorised and pedestrians.	High (2)	High
	Spatial Extent	Local				
	Duration	Short Term				
	Consequence	Severe				
	Probability	Likely				
	Reversibility	Non-Reversible				
	Irreplaceability	High				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				The TMP needs to address, *inter alia*: clearly defined route/s to the site for specific vehicles needed to transport equipment and materials; scheduled deliveries to avoid local congestion; ensure all vehicles are roadworthy, visible, adequately marked, and operated by an appropriately licenced operator.		
Road degradation	Status	Negative	Low (4)	▪ Regular maintenance of the public road network must be undertaken. Specifically, contribute to the maintenance of the public roads in the area that are used by and impacted on by the proposed development/s during the construction phase of the development/s, provided this is agreed to by the relevant road authorities. ▪ Create a local WhatsApp Group for the local community and post notices of road conditions and proposed alternatives. ▪ A photographic record of the road condition should be maintained throughout the various phases of the development/s. This provides an objective assessment and mitigates any subjective view from road users. ▪ Maintain continuous engagement with the Northern Cape Department of Roads and Public Works (NCDRPW) and Western Cape Department of Transport and Public Works (WCDTPW). ▪ Upgrade unpaved roads that are used by and impacted on by the proposed development/s to a suitable condition for proposed construction vehicles, provided this is agreed to by the relevant road authorities. ▪ Ensure that the roads that are used by and impacted on by the proposed development/s are left in the same or better condition, post-construction, based on approval and agreement by the relevant road authorities.	Low (4)	High
	Spatial Extent	Local				
	Duration	Short Term				
	Consequence	Moderate				
	Probability	Very Likely				
	Reversibility	High				
	Irreplaceability	Replaceable				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
Dust	Status	Negative	Low (4)	▪ Contractor to implement dust suppression in the immediate vicinity of the site where feasible. ▪ Contractor shall take into account dust impacts when activities on site are scheduled and executed. ▪ Regular preventative maintenance of roads impacted on and used by the proposed development within the immediate vicinity of the site should be conducted over weekends to minimise the impact on the average construction period. Such maintenance must be undertaken with approval from the relevant local authorities. ▪ Drivers to adhere to the speed limit on the public road.	Low (4)	High
	Spatial Extent	Local				
	Duration	Very Short Term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	High				
	Irreplaceability	Replaceable				
Exhaust Emissions	Status	Negative	High (2)	▪ Ensure that all vehicles used on site are road worthy.	High (2)	High
	Spatial Extent	International				
	Duration	Short Term				
	Consequence	Severe				
	Probability	Likely				
	Reversibility	Non-Reversible				
	Irreplaceability	High				
Hydrocarbon Spills	Status	Negative	Low (4)	▪ Contractor to have an emergency plan in place and spill kit available. ▪ Ensure the use of drip trays during filling of vehicles.	Low (4)	High
	Spatial Extent	Site Specific				
	Duration	Very Short Term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Low				
OPERATIONAL PHASE						
Increased Road Incidents	Status	Negative	High (2)	▪ Reduce the number of vehicles on the roads when transporting staff during peak periods. ▪ Ensure that driver awareness and road safety training is provided.	High (2)	Medium
	Spatial Extent	Local				
	Duration	Long Term				
	Consequence	Severe				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
	Probability	Likely		▪ Ensure all vehicles are roadworthy, visible, adequately marked, and operated by an appropriately licenced operator. ▪ Drivers to adhere to the speed limit on the public road. ▪ Post the speed limits along the relevant roads as approved by the road authority. ▪ Drivers not complying with speed limits shall be subject to penalties.		
	Reversibility	Non-Reversible				
	Irreplaceability	High				

6.2.10 Battery Energy Storage System (BESS) Risk Assessment

The following main issues have been identified in the high-level Safety, Health and Environment (SHE) Risk Assessment for the Battery Energy Storage System (BESS) proposed as part of the WEF.

Solid State Lithium-Ion or Sodium-Ion Batteries (preferred technology):

- The most significant hazard is the possibility of thermal runaway and the generation of toxic and flammable gases.

Redox Flow Batteries (RFB) (assumed vanadium for now but alternative chemistry could be used) (alternative technology):

- The most significant hazard is the possibility of spills of corrosive and environmentally toxic electrolyte.

Cumulative Impact Assessment:

Unless another BESS is installed within 500 m of the BESS location proposed for the WEF, cumulative impacts of other developments in the greater area do not affect the safety and health of employees, contractors of members of the public within the BESS impact zone. The same can be said for the BESS electrical infrastructure and grid connection. This project and the GEED Beaufort West Renewable Energy cluster does not plan additional BESS within 500 m of the Eland BESS, and future projects in the area should not install new BESS within 500 m of any existing BESS. Therefore, from a safety and health point of view, there are no significant cumulative impacts from any other BESS installation in the greater area.

Concluding Statement:

It is the recommendation of the specialist that the project should be granted EA as, from a SHE risk perspective, there is no reason to prohibit the development.

Refer to the BESS SHE Risk Assessment in Appendix G.10 of this EIA Report for detailed information on the potential issues identified and mitigation measures recommended.

6.2.11 Geotechnical Impact Assessment

Impact Assessment:

The following potential geotechnical impacts were identified that are likely to be associated with the proposed development:

Construction Phase:

- **Displacement of geologic material**: Removal of rocks and other geologic materials for site levelling and grading, resulting in loss of geologic materials, e.g. topsoil removal/loss, and potentially the destruction of habitats of endemic species.

- **Contamination of geologic materials** as a consequence of the construction activities by earthworks machinery and other apparatus.

Operational Phase:

- **Increased unnatural hard surfaces** yielding increased runoff, potentially increasing erosion.

- **Contamination of geologic materials** as a consequence of typical maintenance activities (for example, washing of infrastructure with hazardous cleaning agents), or spillages associated with the BESS.

Decommissioning Phase:

- **Increased unnatural hard surfaces** yielding increased runoff, potentially increasing erosion.

- **Contamination and disturbance of geologic materials** as a consequence of typical decommissioning activities.

Cumulative Impact Assessment:

The same impacts described above were identified in the cumulative impact assessment for the construction, operational and decommissioning phases.

The cumulative impacts identified include the impacts related to the construction, operational and decommissioning phases across the proposed development including the entire GEED Southern, Middle and Northern clusters, and the neighbouring similar proposed developments in the region occurring within a radius of 30 km from the study area. Overall, the risk that impacts associated with removal, displacement, and contamination of geological material beyond this project site is very low as long as the appropriate mitigation measures are implemented. Furthermore, the risk of the proposed project receiving cumulative impacts from the surrounding developments is also quite low, providing appropriate mitigation measures are followed.

Concluding Statement:

Based on the findings of the Geotechnical Impact Assessment, the proposed project should proceed (i.e. should receive EA) provided the mitigation measures recommended in the study are implemented. No fatal flaws from a geotechnical standpoint have been identified.

Refer to the Geotechnical Specialist Assessment in Appendix G.11 of this EIA Report for detailed information on the potential impacts identified and mitigation measures recommended. The table below provides a summary of the impact assessment for this study.

Table 6.13: Impact assessment of the potential geotechnical risks and impacts of the proposed project.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
DIRECT IMPACTS						
CONSTRUCTION PHASE						
Displacement of geologic materials	Status	Negative	Low (4)	▪ Favour dolerite as an aggregate (as opposed to Karoo sandstones and mudstones). This is subject to investigation. ▪ Any road cuttings should be designed by an appropriately qualified professional. ▪ Drainage on site should be designed and managed appropriately. ▪ Investigate and confirm the geotechnical suitability of each structure (or other appropriate level of investigation) prior to construction (i.e. determine that soil with an adequate bearing capacity is obtained beneath each footing). Such investigations would not be required to fulfil the requirements of this EIA process. However, it would be necessary prior to construction. ▪ Only strip vegetation necessary for the next phase of construction. ▪ Install temporary drainage to divert stormwater away from active construction activities, where required. ▪ Stormwater Management Plan must be developed in the pre-construction phase. It should detail the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems (in consultation with suitably qualified professionals). ▪ Effective stormwater management must include effective stabilisation (e.g. gabions and Reno mattresses) of exposed soil. ▪ Suitable stormwater management systems must be installed along roads and other areas and be monitored during the first few months of use. Any erosion/sedimentation must be resolved through any additional interventions that may be necessary (e.g., extension, energy dissipaters, spreaders, etc.).	Very Low (5)	Medium
	Spatial Extent	Local				
	Duration	Short term				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Where impacted through construction-related activities, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled. ▪ Sloped areas stabilised using designed structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly. ▪ Any rehabilitation should be scheduled to ensure rehabilitation can take place at the optimal time for vegetation establishment. ▪ Where earthwork is being undertaken near any watercourses, slopes must be stabilised using suitable materials, e.g. sandbags or geotextile fabric, to prevent sand and rock from entering the channel. Subject to mitigation measures specified by the Aquatic Biodiversity specialist. ▪ Appropriate rehabilitation and re-vegetation measures for any disturbed watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows. Subject to mitigation measures specified by the Aquatic Biodiversity specialist.		
Contamination of geologic materials	Status	Negative	Low (4)	▪ During the execution of the works, appropriate measures to prevent pollution and contamination of the environment must be implemented, e.g. ensuring that construction equipment is well maintained. ▪ Provision must be made for refuelling at the storage area / site camp, and workshop by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained. ▪ Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used. ▪ A spill kit should be maintained on site. If spillages occur, they should be contained and removed as rapidly as possible, with	Very Low (5)	Medium
	Spatial Extent	Local				
	Duration	Short term				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				correct disposal procedures of the spilled material, as reported. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes.		
OPERATIONAL PHASE						
Increased unnatural hard surfaces	Status	Negative	Low (4)	▪ Install drainage to divert stormwater away from activities, roads/tracks, and structures, where required. ▪ Implement the Stormwater Management Plan. ▪ Generic management for typical infrastructure of the proposed development, including: o Suitable stormwater management systems must be installed along roads and other areas and monitored during the first few months of use. Any erosion / sedimentation must be resolved through any additional interventions that may be necessary (e.g., extension, energy dissipaters, spreaders, etc.). o Maintain sloped areas stabilised using design structures or vegetation (as specified in the design) to prevent erosion of embankments. o No regular maintenance activities to take place outside of the authorised footprint and all vehicles to remain on authorised roads and tracks.	Very Low (5)	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				
Contamination of geologic materials	Status	Negative	Low (4)	▪ During the execution of the operations, appropriate measures to prevent pollution and contamination of the environment must be implemented e.g. ensuring that construction equipment is well maintained. ▪ Provision must be made for refuelling at the storage area by protecting the soil with an impermeable groundcover/bunding. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained. ▪ Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used.	Very Low (5)	Medium
	Spatial Extent	Local				
	Duration	Short term				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ A spill kit should be maintained on site. If spillages occur, they should be contained and removed as rapidly as possible, with correct disposal procedures of the spilled material, as reported. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes. ▪ Ensure that the BESS is assembled in line with relevant product specifications and with the necessary measures to prevent potential contamination of the surrounding environment. ▪ For the BESS, it is recommended that any wastewater produced by fire hydrants should not be allowed to runoff into the environment, and any waste products produced from the BESS should be removed and disposed of appropriately.		
DECOMMISSIONING PHASE						
Increased unnatural hard surfaces	Status	Negative	Very Low (5)	▪ Only drive and park vehicles where necessary. ▪ Land rehabilitation to near natural state, i.e. removal of foundations and backfilling of any resultant voids within the soil, as well as removal of hard surfaced areas. Replacement soil should be sourced locally to ensure homogeneity. Reseed with natural vegetation and grasses to further mitigate future displacement. ▪ Reinstate natural topography where cut-to-fill embankments have been constructed. ▪ Implement generic environmental management procedures for infrastructure.	Very Low (5)	Medium
	Spatial Extent	Local				
	Duration	Short term				
	Consequence	Slight				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				
Contamination of geologic materials	Status	Negative	Very Low (5)	▪ During the execution of the decommissioning, appropriate measures to prevent pollution and contamination of the environment must be implemented e.g. ensuring that equipment is well maintained. ▪ Provision must be made for refuelling at the storage area/site camp by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained.	Very Low (5)	Medium
	Spatial Extent	Local				
	Duration	Short term				
	Consequence	Slight				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used. ▪ A spill kit should be maintained on site. If spillages occur, they should be contained and removed as rapidly as possible, with correct disposal procedures of the spilled material, as reported. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes.		
CUMULATIVE IMPACTS						
CONSTRUCTION PHASE						
Displacement of geologic materials	Status	Negative	Moderate (3)	▪ Only strip vegetation necessary for the next phase of construction. ▪ Install temporary drainage to divert stormwater away from active construction activities, where required. ▪ Stormwater Management Plan must be developed in the preconstruction phase. It should detail the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems (in consultation with suitably qualified professionals). Effective stormwater management must include effective stabilisation (e.g. gabions and Reno mattresses) of exposed soil. ▪ Suitable stormwater management systems must be installed along roads and other areas and be monitored during the first few months of use. Any erosion/sedimentation must be resolved through any additional interventions that may be necessary (e.g., extension, energy dissipaters, spreaders, etc). ▪ Where impacted through construction-related activities, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled. ▪ Sloped areas stabilised using designed structures or vegetation as specified in the design to prevent erosion of embankments.	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Medium-term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				The contract design specifications must be adhered to and implemented strictly. ▪ Any rehabilitation should be scheduled to ensure rehabilitation can take place at the optimal time for vegetation establishment. ▪ Where earthwork is being undertaken near any watercourses, slopes must be stabilised using suitable materials, e.g. sandbags or geotextile fabric, to prevent sand and rock from entering the channel. Subject to mitigation measures specified by the Aquatic Biodiversity specialist. ▪ Appropriate rehabilitation and re-vegetation measures for any disturbed watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows. Subject to mitigation measures specified by the Aquatic Biodiversity specialist.		
Contamination of geologic materials	Status	Negative	Moderate (3)	▪ During the execution of the works, appropriate measures to prevent pollution and contamination of the environment must be implemented, e.g. ensuring that construction equipment is well maintained. ▪ Provision must be made for refuelling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained. ▪ Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used. ▪ A spill kit should be maintained on site. If spillages occur, they should be contained and removed as rapidly as possible, with correct disposal procedures of the spilled material, as reported. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes.	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Medium-term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
OPERATIONAL PHASE						
Increased unnatural hard surfaces	Status	Negative	Moderate (3)	▪ The mitigation measures are the same as those recommended for the same impact during the Operational Phase.	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Medium-term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				
Contamination of geologic materials	Status	Negative	Moderate (3)	▪ The mitigation measures are the same as those recommended for the same impact during the Operational Phase.	Low (4)	Medium
	Spatial Extent	Regional				
	Duration	Medium-term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				
DECOMMISSIONING PHASE						
Increased unnatural hard surfaces	Status	Negative	Moderate (3)	▪ The mitigation measures are the same as those recommended for the Decommissioning Phase.	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Short term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				
Contamination of geologic materials	Status	Negative	Moderate (3)	▪ The mitigation measures are the same as those recommended for the Construction, Operational and Decommissioning Phases (as relevant).	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Short term				
	Consequence	Substantial				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	Moderate				

6.2.12 Bats

Impact Assessment:

The following potential impacts on bats were identified that are likely to be associated with the proposed development:

Construction Phase:
- Displacement of bats due to habitat loss / habitat transformation.
- Roost disturbance; and
- Roost destruction;

Operational Phase:
- Mortality of bats due to turbine collisions while commuting/foraging;
- Mortality of bats due to turbine collisions during migrations; and
- Light pollution associated risks including loss of insect prey and increased collision risks for bats foraging closer to turbines.

Decommissioning Phase:
- Displacement of bats due to disturbance associated with the decommissioning activities.

Cumulative Impact Assessment:

Cumulative impacts were assessed by considering the presence of multiple wind and solar energy facilities within a 50 km radius. While cumulative bat mortality is a concern, especially for high-flying species, the application of consistent mitigation strategies across facilities can help manage this risk. The following cumulative impact was identified:

Operational Phase:
- Cumulative Bat Mortality Impacts.

Concluding Statement:

The bat specialist team recommended that the proposed project receive EA. The development is considered compatible with bat conservation, contingent upon the implementation of all proposed mitigation measures and ongoing monitoring. Overall, with these safeguards in place, the project poses a manageable risk to bat populations and aligns with environmental best practices.

Refer to the Bat Impact Assessment in Appendix G.12 of this EIA Report for detailed information on the potential impacts identified and mitigation measures recommended.Table The table below provides a summary of the impact assessment for this study.

Table 6.14: Impact assessment of the potential bat species risks and impacts of the proposed project.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
CONSTRUCTION PHASE						
Displacement of bats due to habitat loss / habitat transformation	Status	Negative	Very Low (5)	▪ During construction, laydown areas and temporary access roads should be kept to a minimum in order to limit direct vegetation loss and habitat fragmentation. Construction of the infrastructure should, where possible, be situated in areas that are already disturbed. ▪ This impact must be reduced by limiting the removal of vegetation, particularly large mature trees within 50 m of turbine positions. ▪ Following construction, appoint a suitably qualified specialist to rehabilitate of all areas disturbed (e.g. temporary access tracks and laydown areas).	Very Low (5)	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Slight				
	Probability	Very Unlikely				
	Reversibility	High				
	Irreplaceability	Low				
Roost Disturbance	Status	Negative	Very Low (5)	▪ Limit roost abandonment by avoiding construction activities near roosts. ▪ Large mature trees within 50 m of the turbine positions should be inspected for roosting bats, and appropriate mitigation should be undertaken as recommended by a bat specialist. ▪ Potential roosts, specifically buildings and rocky crevices, must be buffered by 200 m, inside which no turbine infrastructure may be placed. No turbines should be installed within 50 m of large mature trees. *Note that no roosts were identified in the study area during the site survey. Additionally, the current layout adheres to the high sensitivity buffer zones identified by the specialist, as no turbines fall within the high sensitivity areas.*	Very Low (5)	Medium
	Spatial Extent	Local				
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Replaceable				
Roost Destruction	Status	Negative	Moderate (3)	▪ The WEF must be designed and constructed in such a way as to avoid the destruction of potential and actual roosts, particularly large mature trees, buildings, and rocky crevices (if blasting is required).	Very Low (5)	Medium
	Spatial Extent	Local				
	Duration	Permanent				
	Consequence	Substantial				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
	Probability	Unlikely		▪ It is recommended that potential roosts, specifically buildings and rocky crevices, are buffered by 200 m, inside which no turbine infrastructure may be placed. ▪ No turbines should be installed within 50 m of large mature trees. *Note that no roosts were identified in the study area during the site survey. Additionally, the current layout adheres to the high sensitivity buffer zones identified by the specialist, as no turbines fall within the high sensitivity areas.*		
	Reversibility	Non-reversible				
	Irreplaceability	Moderate				
OPERATIONAL PHASE						
Mortality of bats due to turbine collisions while commuting/foraging	Status	Negative	High (2)	▪ Designing the layout of the project to avoid areas that are more frequently used by bats will reduce the likelihood of mortality and should be the primary mitigation measure. These areas include key microhabitats such as water features, large mature trees, buildings, and rocky crevices. These areas have been buffered by 200 m. <u>No turbines are currently located within the buffers</u>. ▪ The height of the lower blade swept area must be maximised, and should try to be kept above 50 m. If the minimum blade sweep is lower than 50 m from ground level, the facility runs the risk of reaching fatality thresholds sooner. *Note that the proposed hub height is up to 200 m, whilst the proposed blade length is approximately 100 m. As such, the proposed WEF's lower blade sweep height from ground level is approximately 100 m.* ▪ Operational monitoring should be done according to the guidelines for the first 2 years and every 5 years thereafter. During this monitoring fatality estimations would need to be evaluated every 3 – 4 months against the South African Bat Assessment Association (SABAA) fatality threshold guidelines (i.e. if they exceed an estimated 24 bat fatalities	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Severe				
	Probability	Very Likely				
	Reversibility	Non-reversible				
	Irreplaceability	High				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				per year as per the current threshold) to determine escalation of mitigation options. ▪ Blade feathering should be implemented at the start of operation. ▪ Apply curtailment during spring, summer and autumn based on an appropriate curtailment plan and/or instal acoustic deterrents (based on input from an appropriate bat specialist) if mortality occurs beyond threshold levels as determined based on applicable guidance (MacEwan et al. 2018). The threshold calculations must be done at a minimum of once a quarter (i.e. not only after the first year of operational monitoring) so that mitigation can be applied as quickly as possible should thresholds be reached.		
Mortality of bats due to turbine collisions during migrations	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Regional Long term Substantial Unlikely Moderate Moderate	Moderate (3)	▪ The mitigation measures are the same as those recommended for the following impact during the Operational Phase: *Mortality of bats due to turbine collisions while commuting/foraging*	Low (4)	Medium
Light pollution associated risks including loss of insect prey and increased collision risks for bats foraging closer to turbines	Status Spatial Extent Duration Consequence Probability Reversibility Irreplaceability	Negative Local Long term Slight Likely High Low	Very Low (5)	▪ This impact can be mitigated by using as little lighting as possible, and only where essential for operation of the facility. ▪ Where lights need to be used such as at the collector substation and switching station and elsewhere, these should have low attractiveness for insects such as low pressure sodium and warm white LED lights (Rydell 1992; Stone 2012). High pressure sodium and white mercury lighting is attractive to insects (Blake et al. 1994; Rydell 1992; Svensson & Rydell 1998) and should not be used as far as possible. ▪ Lighting should be fitted with movement sensors to limit illumination and light spill, and the overall lit time. In addition, light spread should be directed downwards and below the horizontal plane to minimise light trespass and sky glow.	Very Low (5)	Medium

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Raking (Post-mitigation)	Confidence Level
				▪ Increasing the spacing between lights, and the height of light units can reduce the intensity and volume of the light to minimise the area illuminated and give bats an opportunity to fly in relatively dark areas between and over lights.		
DECOMMISSIONING PHASE						
Displacement of bats due to disturbance associated with the decommissioning activities	Status	Negative	Very Low (5)	▪ The impacts to bats during this phase are likely to be restricted to disturbance. Provided decommissioning activities are restricted to daylight hours, the impact to bats is predicted to be negligible.	Very Low (5)	Medium
	Spatial Extent	Local				
	Duration	Short term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	High				
	Irreplaceability	Replaceable				
CUMULATIVE IMPACTS						
Cumulative Bat Mortality Impacts	Status	Negative	High (2)	▪ The mitigation measures are the same as those recommended for the following impact during the Operational Phase: *Mortality of bats due to turbine collisions while commuting/foraging*	Low (4)	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Severe				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	High				

6.2.13 Noise

Impact Assessment

The following potential noise impacts were identified that are likely to be associated with the proposed development:

Construction Phase:

- **Noise pollution due to construction activities**. There will be an impact on the immediate surrounding environment from the construction activities, especially if pile driving is to be done. This, however, will only occur if the underlying geological structure requires piling. The area surrounding the construction site will be affected for a short period of time in all directions by construction noise impacts, should several pieces of construction equipment be used simultaneously. The number of construction vehicles that will be used in the project will add to the existing residual levels and will most likely cause a disturbing noise, albeit for a short period of time.

Operational Phase:

- **Mechanical and aerodynamic noise from the operation of the wind turbine components.** The residual noise increases as the wind speed increases as the masking effect increases i.e. the audible noise from the wind farm becomes less as wind noise masking increases. Under very stable atmospheric conditions, a temperature inversion or a light wind, the turbines will in all likelihood not be operational as the cut-in speed is 3 m/s. As the wind speed increases above the cut-in speed the residual noise will also increase. If the atmospheric conditions are such that the wind is very light (<3 m/s), at ground level, but the wind speed exceeds the cut-in speed at hub height, then the turbines will begin to operate. It is thus feasible that little noise masking will occur at this low windspeed. The critical wind speeds are thus between 3-5 m/s at hub height when there may be minimal masking at ground level. All the Noise Sensitive Areas (NSAs) will meet the SANS 10103:2008 night and day limit at wind speeds below 6m/s, except for NSA NC7.

Decommissioning Phase:

- During the Decommissioning Phase, the noise impacts will be the same as the Construction Phase.

Cumulative Impacts:

- Based on the modelling results for the cumulative Operational Phase, the impact will low significance before and after mitigation, from a noise perspective. The cumulative impacts for the Construction and Decommissioning Phases were not assessed due to the distance between the windfarms and the extremely low likelihood of all cumulative windfarms construction noise sources being located in close proximity to each other at the same time.

Concluding Statement

The noise specialist has recommended that the development receive EA.

Refer to the Noise Impact Assessment in Appendix G.13 of this EIA Report for detailed information on the potential impacts identified and mitigation measures recommended. The table below provides a summary of the impact assessment for this study.

Table 6.15: Impact assessment of the potential noise risks and impacts of the proposed project.

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Ranking (Post-mitigation)	Confidence Level
DIRECT IMPACTS						
CONSTRUCTION PHASE						
Noise pollution due to construction activities (equipment and vehicle noise)	Status	Negative	Very Low (5)	▪ Staff to receive training on noise sensitivity. ▪ Comply with the Western Cape Noise Control Regulations published in Provincial Notice 200/2013. ▪ Monitor noise during the construction phase to confirm noise levels are within limits. ▪ Limit construction / piling to daytime. ▪ Regularly service equipment to ensure no unnecessary noise is emitted.	Very Low (5)	High
	Spatial Extent	Local				
	Duration	Short Term				
	Consequence	Slight				
	Probability	Very Unlikely				
	Reversibility	Highly Reversible				
	Irreplaceability	Replaceable				
OPERATIONAL PHASE						
Daytime: Mechanical and aerodynamic noise from the operation of the wind turbine components	Status	Negative	Very Low (5)	▪ Conduct noise monitoring during the operational phase to determine actual noise impact and whether further mitigation measures need to be implemented. This may include operating the turbine in a low noise mode (i.e. reducing power output under certain operational conditions). ▪ Comply with the Western Cape Noise Control Regulations published in Provincial Notice 200/2013. ▪ Implement a 500m buffer around all noise sensitive areas to ensure no future WTGs impact these noise sensitive areas. Note that the recommended 500 m no-go buffers have been applied and that no WTG are located within these NSAs.	Very Low (5)	High
	Spatial Extent	Local				
	Duration	Long Term				
	Consequence	Slight				
	Probability	Very Unlikely				
	Reversibility	Highly Reversible				
	Irreplaceability	Replaceable				
Nighttime: Mechanical and aerodynamic noise from the operation of the wind turbine components	Status	Negative	Very Low (5)	▪ Conduct noise monitoring during the operational phase to determine actual noise impact and whether further mitigation measures need to be implemented. This may include operating the turbine in a low noise mode (i.e. reducing power output under certain operational conditions).	Very Low (5)	High
	Spatial Extent	Local				
	Duration	Long Term				
	Consequence	Slight				
	Probability	Unlikely				
	Reversibility	Highly Reversible				
	Irreplaceability	Replaceable				

Impact	Impact Criteria		Significance Ranking (Pre-mitigation)	Potential mitigation measures	Significance Ranking (Post-mitigation)	Confidence Level
				▪ Comply with the Western Cape Noise Control Regulations published in Provincial Notice 200/2013. ▪ Implement a 500m buffer around all noise sensitive areas to ensure no future WTGs impact these noise sensitive areas. Note that the recommended 500 m no-go buffers have been applied and that no WTG are located within these NSAs.		
DECOMMISSIONING PHASE						
Noise pollution due to decommissioning activities (equipment and vehicle noise)	Status	Negative	Very Low (5)	▪ Staff to receive training on noise sensitivity. ▪ Monitoring of noise during the decommissioning phase to confirm noise levels are within limits. ▪ Limit decommissioning activities to daytime in order to take advantage of unstable weather conditions. ▪ Regularly service equipment to ensure no unnecessary noise is emitted.	Very Low (5)	High
	Spatial Extent	Local				
	Duration	Short Term				
	Consequence	Slight				
	Probability	Very Unlikely				
	Reversibility	Highly Reversible				
	Irreplaceability	Replaceable				
CUMULATIVE IMPACTS						
OPERATIONAL PHASE						
Mechanical and aerodynamic noise from the operation of the wind turbine components	Status	Negative	Low (4)	▪ Conduct noise monitoring during the operational phase once all WEFs have been developed to determine actual noise impact and whether further mitigation measures need to be implemented. This may include operating the turbine in a low noise mode (i.e. reducing power output under certain operational conditions). ▪ Implement a 500m buffer around all noise sensitive areas to ensure no future WTGs impact these noise sensitive areas. Note that the recommended 500 m no-go buffers have been applied and that no WTG are located within these NSAs.	Low (4)	High
	Spatial Extent	Local				
	Duration	Long Term				
	Consequence	Moderate				
	Probability	Unlikely				
	Reversibility	Highly Reversible				
	Irreplaceability	Replaceable				

6.2.14 Wake Effects

In general, the DFFE advises that the potential wake effect between proposed projects and neighbouring facilities which are either authorised or already operational, needs to be considered as part of the EIA Process for the development of wind energy generation projects. The wake effect assessment is a technical report and therefore and does not comply with Appendix 6 of the 2014 NEMA EIA Regulations (as amended) or the Assessment Protocols published in GN 320 on March 2020.

Although there is the potential for a small reduction in yield that could affect socio-economic and enterprise development funding per project, the net effect of all projects contributing to the local community is considered significantly more positive and beneficial.

The potential wake loss impacts on all proposed WEFs by Eland WEF and vice versa has been recognised, and the applicant is committed to addressing wake loss if any or all facilities are commercialised. If the wake impact assessment is updated with final turbine layouts, turbine model, hub heights and other technical considerations, then the wake impact predictions will be significantly more accurate. Only at the point of more certainty around wind farm configurations and commercialisation is it fair, equitable and market standard to conclude a Wake Loss Compensation Agreement based on the outcome of a detailed wake loss assessment. The Wake Loss Impact Results at this stage are high-level and do not represent the actual wake loss impacts in the future sufficiently and fairly enough to be able to reach formal agreements. It is thus not reasonable and fair to conclude a Wake Loss Compensation Agreement at this stage. As the project progresses and prepared for commercialisation, the applicant is committed to further engagements with potentially affected WEFs to determine potential issues and impacts of wake loss as may be required.

Refer to Appendix G.16 of this EIA Report for additional information pertaining to wake effects.

6.3 Environmental Sensitivity Mapping and Analysis

Based on the environmental sensitivities identified and verified by the Specialists on site (where needed) during the EIA Phase (as per studies included as Appendix G to this EIA Report), an overall combined environmental feature map and environmental sensitivity map has been compiled for the study area. The proposed development footprint is overlain onto these maps to show how it relates to the environmental features and sensitivities, and how they have been avoided.

Figure 6.3 shows the identified and assessed environmental features present within the study area; whereas Figure 6.4 shows the recommended environmental sensitivity and buffers that have been allocated to these features. Refer to Appendix C of the EIA Report for detailed thematic sensitivity maps. These maps indicate that the environmental sensitivity of the proposed project is mostly medium to low, with areas of very high and high sensitivity. The study area is suited for the development of the proposed project based on the understanding that measures have been taken to firstly avoid the sensitive features as best as possible, and all measures to manage or mitigate potential impacts have been incorporated into the EMPrs (Appendix H of this EIA Report) for implementation on site during the lifecycle of the proposed development, should it be authorised.

Table provides a summary of the environmental sensitivities identified in the respective specialist studies.

Table 6.16: Key Environmental Features and Sensitivities identified by respective EIA Phase Specialist Studies

Specialist Study or Theme	Sensitivity Description
Agriculture	▪ The Site Sensitivity Verification (SSV) verified that the site is of low agricultural sensitivity with a land capability value of 4 to 6. ▪ The project footprint ranges from low to medium agricultural sensitivity, while some parts of the site are confirmed as high and very high sensitivity. The current layout avoids the areas of high and very high sensitivity.
Terrestrial Biodiversity, Terrestrial Plant Species and Terrestrial Animal Species	**Very High Sensitivity:** ▪ Drainage features and associated riparian habitats (suitable for Riverine Rabbit). An up to Up to 500 m buffer width was applied variably depending on landscape context, vegetation density, and the potential for indirect impacts such as turbine noise, shadow flicker, and increased human disturbance. ▪ No-go area for non-linear infrastructure including turbines, hardstands, BESS, substation complex etc. ▪ Steep slopes and dolerite outcrops, which provide sensitive habitats for species such as the Karoo Dwarf Tortoise. A buffer width ranging between of 50 m and up to 300 m was applied variably depending on landscape context, suitable habitat and connectivity within the landscape. ▪ No-go area for non-linear infrastructure including turbines, hardstands, BESS, substation complex, and linear infrastructure (indirect - avoid crows nesting and predation).

Specialist Study or Theme	Sensitivity Description
	High to Very High Sensitivity: ▪ NC BSP CBA 1 representing natural vegetation, ecosystem services and sensitive animal species. All non-linear infrastructure to avoid the CBA1 and linear infrastructure should be reduced as far as possible. ▪ WC BSP CBA2 reworked into the sensitivity map based on site sensitivity verification. Avoidance placing infrastructure within High and Very High sensitivities. ▪ Micrositing should be considered for non-linear infrastructure located in provincial CBAs, High and Very High sensitivity areas. This applies to Turbine 5, as well as the turbine hardstands of Turbine 2, Turbine 4, Turbine 5, Turbine 20, and Turbine 21. **Low to Medium Sensitivity:** ▪ Open plains and low hills: Development may proceed.
Aquatic Biodiversity	**High Sensitivity:** ▪ Valley bottom wetland and associated larger watercourses. ▪ Areas of high aquatic sensitivity should be treated as no-go areas for non-linear hardened areas. ▪ Service roads and grid connection lines can be constructed in high-sensitivity areas but must be adequately mitigated as stipulated in the Aquatic Biodiversity and Species Assessment (Appendix G.3 of this EIA Report). **Medium Sensitivity:** ▪ Smaller streams and drainage features: 35 m buffer. ▪ Valley floor areas: The mapped valley floor area (Appendix G.3 of this EIA Report) incorporates suitable setbacks for instream wetland habitat. ▪ Areas of medium sensitivity should be avoided where possible, but can be developed with mitigation.
Bats	The following features are rated as High sensitivity: Trees; Water reservoirs; Wind pump; Furrow; Non-perennial river; Depression wetland; Seep wetland; Dam; Dry watercourse; and Industrial landuse. Avoidance mitigation techniques have been incorporated by buffering key habitat features for bats. These include potential roosts (rocky crevices, trees and buildings), foraging resources (large trees, drainage lines, and aquatic habitat) and commuting resources (drainage lines). The sensitivity of each buffer was determined relative to the different infrastructure elements incorporated into the project. The buffers are discussed below: **High Sensitivity:** ▪ Buildings, wetlands, NFEPA rivers, farm dams, and rocky outcrops: 200 m buffer as per best practise guidelines. ▪ Smaller drainage lines: 50 m buffer. Notes for consideration: ▪ In the current layout all substations and associated infrastructure do not need to avoid sensitive areas.

Specialist Study or Theme	Sensitivity Description
	▪ All buffers are no-go for turbines to blade tip. ▪ As it stands, there are no turbines where the maximum blade length will encroach into highly sensitive areas in the current layout for the proposed WEF. Therefore, the current turbine layout avoids the high sensitivity areas. ▪ Roosting potential is generally low throughout the entire study area (except for the mountainous regions and farm buildings) and specifically on the Eland WEF site. ▪ No roosts were found in the entire study area and, as such, no roost buffers are required.
Avifauna	**Very High Sensitivity (all infrastructure exclusion zones)**: ▪ Verreaux's Eagle nest: A 1 km all infrastructure exclusion zone must be implemented around the identified Verreaux's Eagle nests. ▪ Martial Eagle nest: A 2.5 km all infrastructure exclusion zone must be implemented around the identified Martial Eagle nests. **High Sensitivity (turbine blade-swept exclusion zones [other infrastructure is allowed]):** ▪ Drainage lines, dams, and waterpoints: A 50 m turbine (blade-swept) exclusion zone must be implemented around all drainage lines, a 100 m turbine (blade-swept) exclusion zone around the river that transects the WEF site (i.e. the Elandsfontein River), and a 200 m turbine (blade-swept) exclusion zone around any boreholes and dams. ▪ Verreaux's Eagle nest: A 3.7 km turbine (blade-swept) exclusion zone must be implemented around Verreaux's Eagle nest locations. ▪ Martial Eagle nest: A 5 km turbine (blade-swept) exclusion zone must be implemented around Martial Eagle nest locations. ▪ Jackal Buzzard nest: A 750 m turbine (blade-swept) exclusion zone must be implemented around Jackal Buzzard nest locations. ▪ Hamerkop nest: A 500 m turbine (blade-swept) exclusion zone must be implemented around Hamerkop nest locations. **Medium Sensitivity:** ▪ Verreaux's Eagle nest: All turbines in the area >3.7 km up to 5.2 km should be regarded as medium-risk and relocated if possible. Should relocation not be feasible, these turbines should be subject to proactive mitigation in the form of a proven mitigation method such as Shutdown on Demand (SDoD), using either bio-monitors or an automated system. The current layout (i.e. project footprint) avoids these very high, high, and medium sensitivity areas.
Visual	**Very High Sensitivity (No-go):** ▪ Home / farmsteads within 5 km. ▪ Shadow Flicker – homesteads located within 1 km. **High Sensitivity:** ▪ Slopes between 1:4 and 1:10.

Specialist Study or Theme	Sensitivity Description
	▪ Major rivers, water bodies, perennial rivers and wetlands with scenic value within 250 m – 500 m. ▪ Moderate Visual Absorption Capacity. ▪ Visual Quality: Natural environment intact with limited built infrastructure. ▪ Very low densities of the presence of existing infrastructure. **Low Sensitivity:** ▪ Topographic features including mountain ridges – more than 2 km. ▪ Coastal zone - more than 4 km. ▪ Protected area: National Parks - more than 15 km. ▪ Protected areas: Nature Reserves – more than 10 km. ▪ Private reserves and game farms – more than 5 km. ▪ Cultural landscape – more than 1 km. ▪ Heritage Sites – more than 1 km. ▪ Towns and Villages - more than 6 km. ▪ National Roads – more than 5 km. ▪ Provincial/arterial roads – more than 3 km. ▪ Scenic routes – more than 5 km. ▪ Passenger rail lines - more than 3 km. Based on the above findings, the sensitivity of the visual receiving environment for the proposed project is found to be **moderate / medium** (excluding the flicker sensitivity). Note: From a shadow flicker perspective, the visual specialist recommended that no turbines should be placed within 1 km of any homesteads, unless otherwise agreed upon by the affected landowner, even if the landowner is located within the development site. Proof of such agreement has been received from the landowner of the property where the homestead, Donkergat, is located. This agreement is included in Appendix C of the Visual Impact Assessment (which is included in Appendix G.5 of the EIA Report). Therefore, the visual specialist confirmed that shadow flicker is not an impact of concern.
Noise	**Very High Sensitivity:** ▪ All Noise Sensitive Areas – 500 m buffer. ▪ No-go for turbines only and not to auxiliary infrastructure. The current turbine layout avoids the very high sensitivity areas.
Heritage (Archaeology and Cultural Heritage)	▪ The footprint of the project area and construction activity must avoid the heritage features subject to buffers ranging between 10 m to 50 m. The current layout avoids all heritage buffers.
Palaeontology	▪ The sensitivity is confirmed as Very High sensitivity based on a site visit, the DFFE Screening Tool and the SAHRIS Palaeo-Sensitivity Map. However, there are no specific areas that need to be avoided from a palaeontology perspective. The Chance Finds Protocol (included in the Palaeontology Impact Assessment in Appendix G.7

Specialist Study or Theme	Sensitivity Description
	of the EIA Report) must be implemented on site during the construction phase.
Socio-Economic Assessment	▪ Not applicable. There are no sensitivities of this nature that can be mapped and that would influence the layout of the proposed project.
Traffic	▪ Not applicable. There are no sensitivities of this nature that can be mapped and that would influence the layout of the proposed project.
BESS High Level Risk Assessment	▪ Ideally, the BESS should be placed at least 50 m away from known boreholes and water points, and outside of the sensitive areas identified by the aquatic specialist. ▪ Ideally, the BESS should be located over 500 m from occupied farmhouses / developments. The current BESS location avoids the above-mentioned areas.
Geotechnical	▪ No areas were identified within the study area that should be avoided from a geotechnical sensitivity perspective. However, areas of moderate to steep topography would likely render development financially unfeasible.
Civil Aviation	▪ No sensitive civil aviation features have been identified within the site.
Defence	▪ No sensitive defence features have been identified within the site.

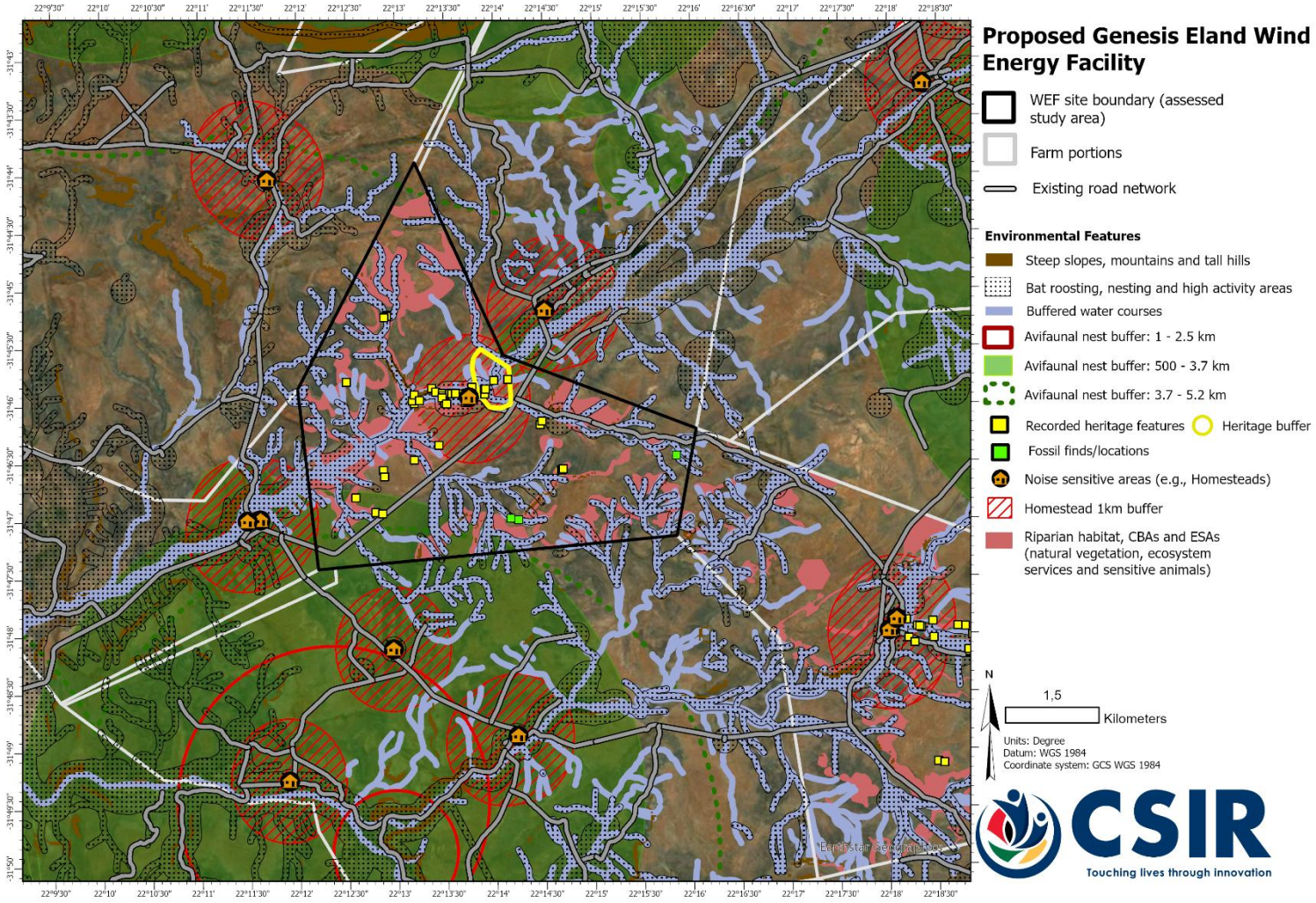


Figure 6.3: Combined environmental feature map for the proposed project study area based on EIA level specialist inputs.

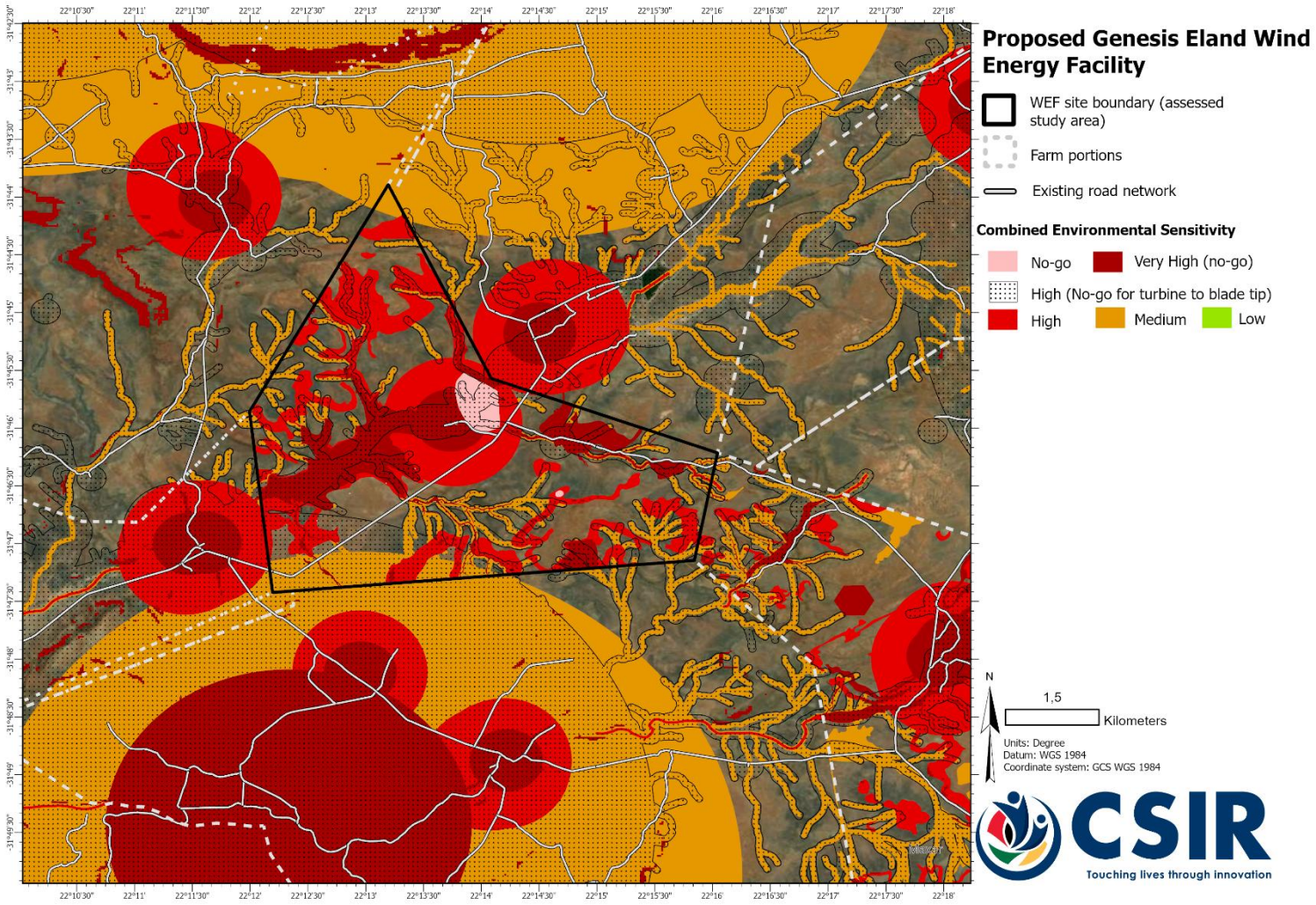
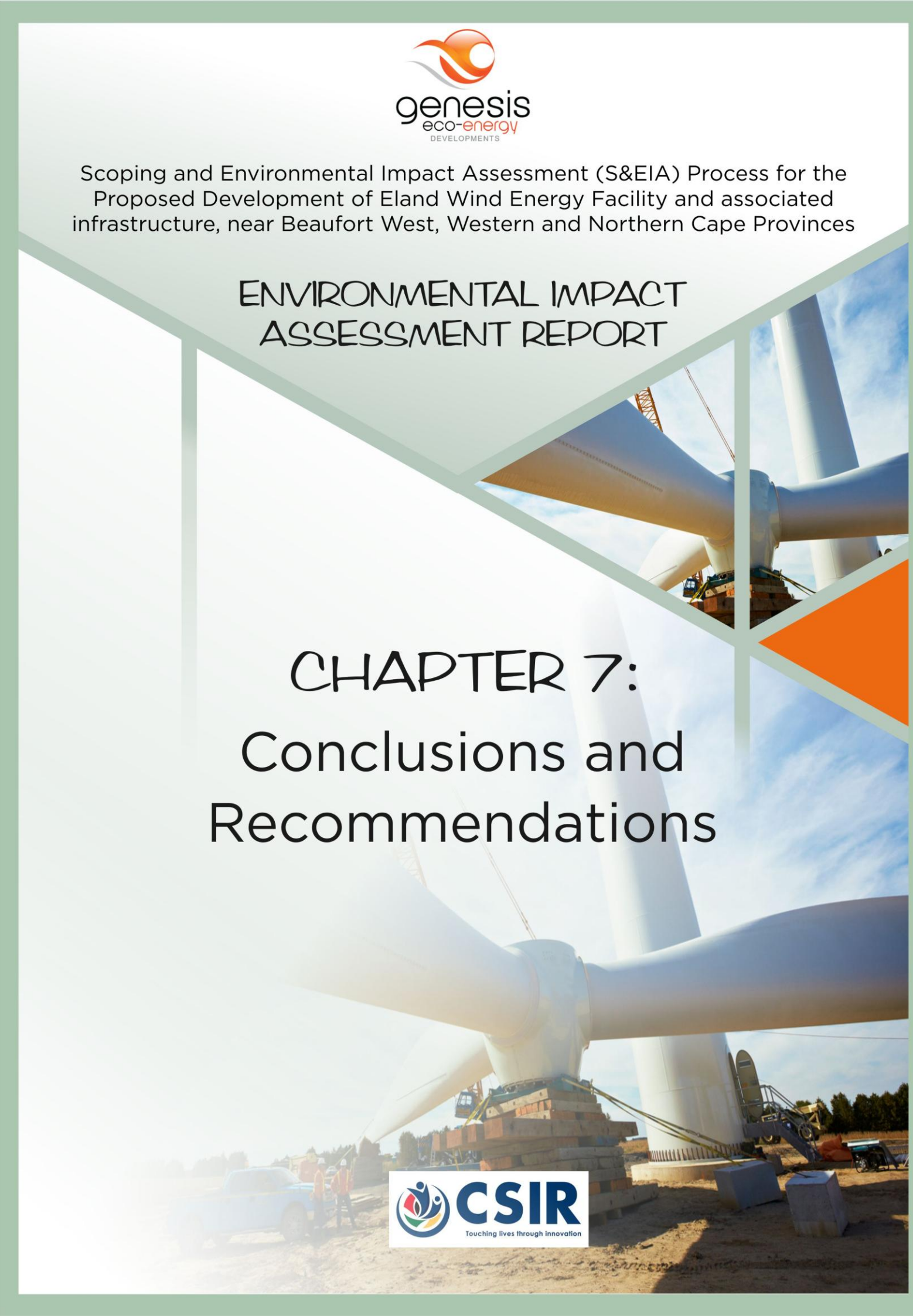


Figure 6.4: Combined environmental sensitivity map for the proposed project study area based on EIA level specialist inputs.

Scoping and Environmental Impact Assessment (S&EIA) Process for the Proposed Development of Eland Wind Energy Facility and associated infrastructure, near Beaufort West, Western and Northern Cape Provinces

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CHAPTER 7: Conclusions and Recommendations



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7. CONCLUSIONS AND RECOMMENDATIONS

This chapter contains the main conclusions and recommendations from the Environmental Impact Assessment (EIA) Process, provides the key findings of the specialist assessments (i.e., outlines the most significant key impacts identified, together with the key mitigation and enhancement actions required to respectively avoid or mitigate the negative impacts or enhance positive benefits), and an integrated summary of factors that will inform decision-making by the Competent Authority (i.e., the Department of Forestry, Fisheries and the Environment (DFFE)). In addition, the chapter also includes the recommendation of the Environmental Assessment Practitioner (EAP) on the environmental suitability of the project and whether the project should receive Environmental Authorisation (EA).

This EIA Report has investigated and assessed the significance of potential positive and negative direct, indirect and cumulative impacts associated with the proposed Eland Wind Energy Facility (WEF) (hereafter referred to as the "proposed project" or "Eland WEF"). Detailed assessments of the potential impacts identified and assessed by the specialists during the EIA Phase are included in Appendix G of this EIA Report, as well as summarised and integrated into Chapter 6 of this EIA Report.

This chapter constitutes an **Environmental Impact Statement**, as required in terms of Appendix 3 of the 2014 NEMA EIA Regulations (as amended), which includes the following:

- a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted Scoping Report indicating any areas that should be avoided, including buffers (Section 7.1);
- a summary of the identified project alternatives (Section 7.3);
- a summary of the key findings of the EIA (Section 7.4 and Section 7.5); and
- a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives (Section 7.4 and Section 7.5).

7.1 Development Footprint for Approval based on Environmental Sensitivity Mapping

During the Scoping Phase, detailed specialist studies were conducted for the study area, including further desktop analysis and field surveys, where relevant. The farm portions and Electricity Grid Infrastructure (EGI) Corridor forming part of the study area are listed in Chapter 2 of this EIA Report. The assessment of the study area led to the identification of environmental features, which were assigned relevant sensitivities by the specialists, as described in Chapter 6 of this EIA Report. The sensitivities identified were taken into consideration and the Scoping Buildable Areas were formulated.

During the EIA Phase, the revised development footprint and layout plan (Figure 7.1) were developed based on the buildable areas. The combined layout and sensitivity map compiled during the EIA Phase (Figure 7.3) indicates that the environmental sensitivity of the proposed project is mostly medium to low, with areas of very high and high sensitivity. However, as indicated in Figure 7.3, all no-go areas identified by the specialists have been predominately avoided by the proposed

project. Some linear infrastructure, such as access roads and the 132 kV power line, is acceptable to traverse high or very high sensitivity areas as the Aquatic Biodiversity, Terrestrial Biodiversity and Avifauna specialists have provided adequate mitigation measures and recommendations, which have been incorporated into the Environmental Management Programmes (EMPrs) for the proposed project. The EMPrs are included in Appendix H of this EIA Report. Furthermore, the Terrestrial Biodiversity specialist recommended that micrositing should be considered for non-linear infrastructure that currently slightly encroaches into provincial Critical Biodiversity Areas (CBAs), and High and Very High sensitivity areas identified by the Terrestrial Biodiversity Specialist.

Overall, the study area is suited for the proposed development given that measures have been taken to avoid the sensitive features as best as possible, and all aspects to manage or mitigate potential impacts have been identified in the EIA Phase and included in the EMPrs.

Following the exclusion of “no-go” areas as identified by the specialist studies and discussed in Chapter 6 of this EIA Report, no negative impacts (after mitigation) have been identified within this EIA that, in the opinion of the EAP who has conducted this Scoping and EIA Process, should be considered “fatal flaws” from an environmental perspective, and thereby necessitate substantial re-design or termination of the proposed project. Furthermore, as presented in this chapter, the conclusions from the specialist studies do not identify any reason why the proposed project should not receive EA, provided the recommended mitigation measures are applied effectively.

Maps have been included in this chapter, whereby the development footprint has been overlain onto the sensitivity map to show how they relate to the environmental features and sensitivities, and how the no-go areas have been avoided. Refer to the following maps in this regard:

- Figure 7.1 illustrates a **final** project layout map detailing the development footprint for Eland WEF and associated infrastructure.
- Figure 7.2 illustrates a combined **final** project layout and environmental feature map for Eland WEF and associated infrastructure.
- Figure 7.3 illustrates a combined **final** project layout and environmental sensitivity map for Eland WEF and associated infrastructure.

The final project layout map shown in Figure 7.1 was assessed during the EIA Phase and has been recommended by the EAP for approval for the proposed project.

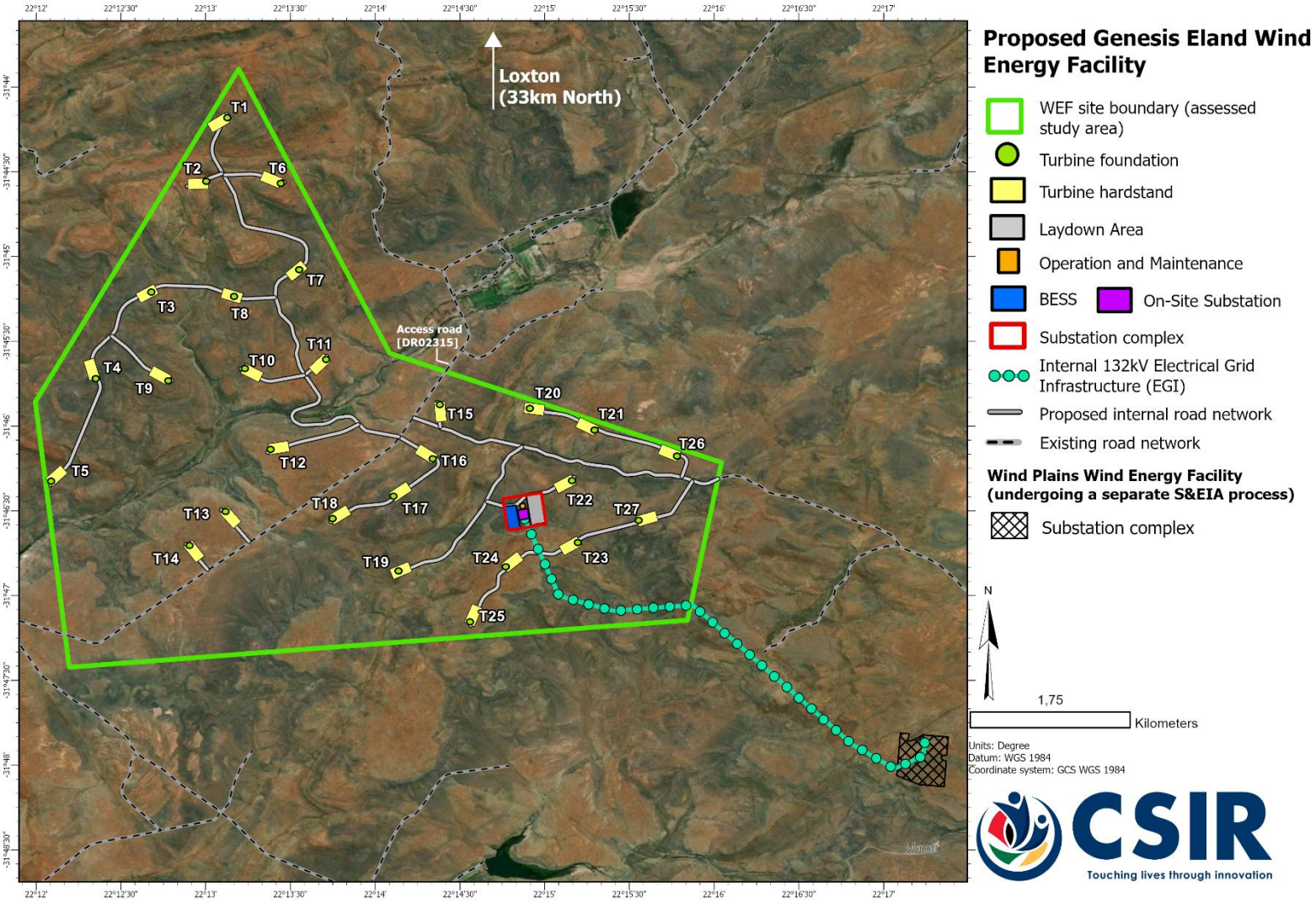

Figure 7.1: Final Project Layout Map showing the detailed infrastructure and development footprint for the proposed Eland WEF.

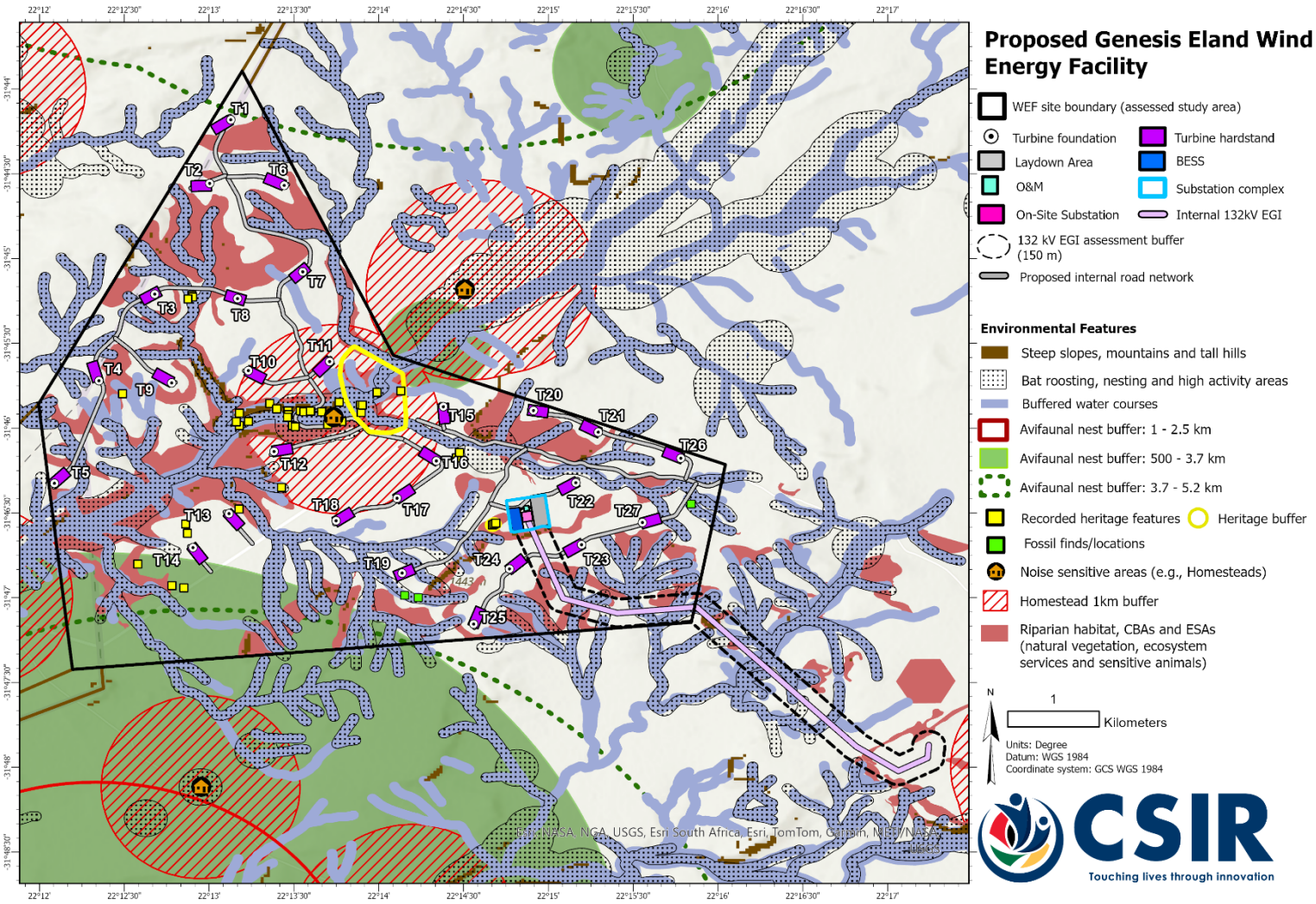

Figure 7.2: Combined Final Project Layout Map and Environmental Feature Map for the proposed Eland WEF.

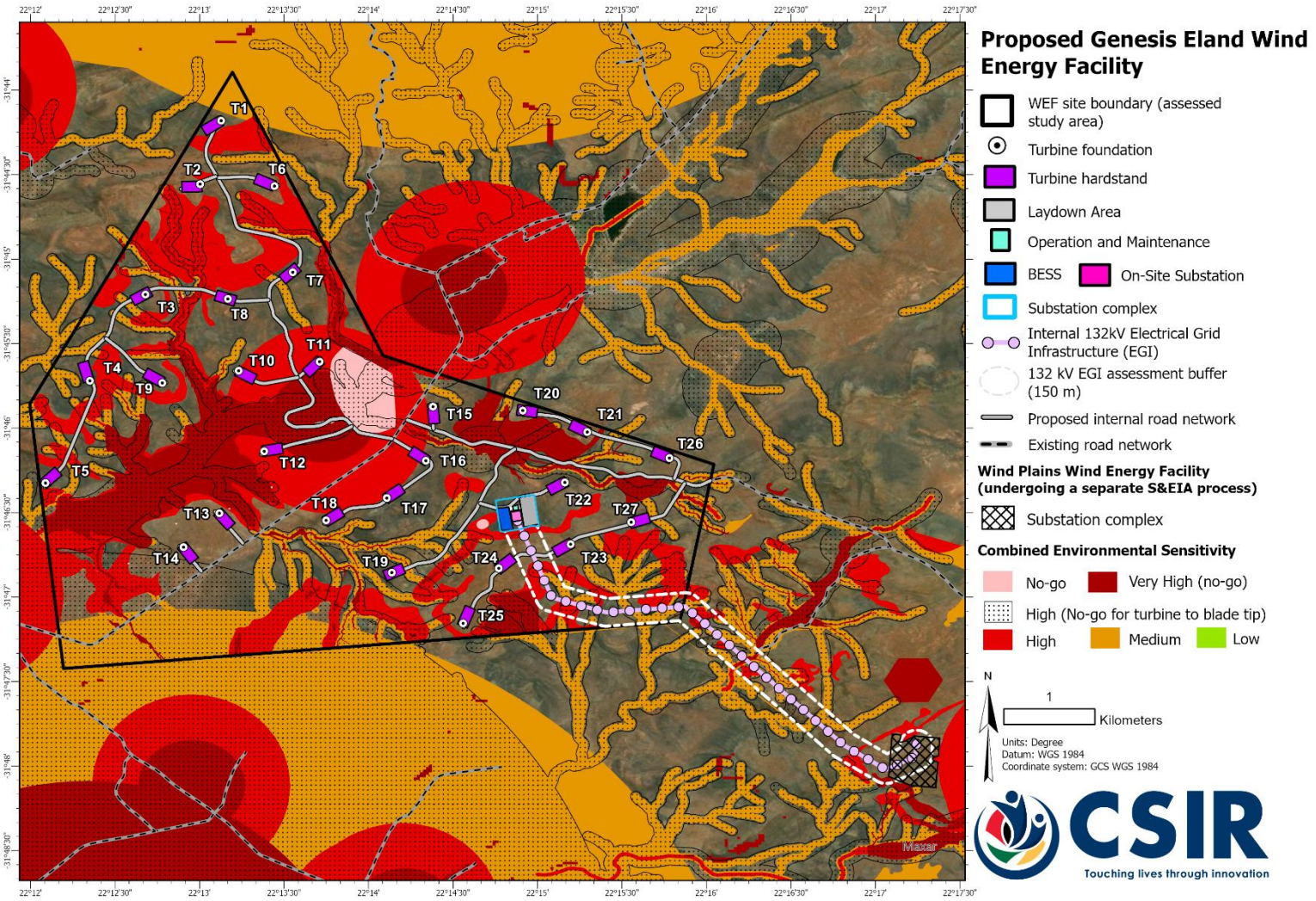

Figure 7.3: Combined Final Project Layout Map and Environmental Sensitivity Map for the proposed Eland WEF.

7.2 Need and Desirability

For development to be sustainable, it is important that the EIA process ascertain whether the proposed development will meet the needs of people, and whether it will be socially, economically, and ecologically desirable. This EIA considered the nature, scale and location of the proposed development, as well as the wise use of land (i.e., is this the right time and place for the development of this proposed project).

The need for the development of renewable energy is strongly supported at a national, provincial, and local level. The proposed project is linked to the national planning vision for large-scale wind and solar development in South Africa. The need for renewable energy is becoming increasingly apparent, in both local and international contexts, with South Africa's international climate commitments obligating it to transition from its substantial (90%) dependence on a fossil fuel-based energy system to a sustainable, clean, and affordable energy system based on renewable resources and low carbon-emitting technologies. As recognised by the National Energy Act (Act 34 of 2008) and the NDP: Vision 2030, the clean energy transition can be a critical enabler of inclusive (just) and transformational economic development that is contained within the limits of surrounding socio-ecological systems.

Moreover, high unemployment, particularly youth unemployment, is a common challenge in the Beaufort West, Karoo Hoogland, and Ubuntu Local Municipalities. In line with this, the development of the proposed WEF will contribute to the municipalities' vision of creating employment opportunities and for supporting sustainable economic growth, particularly during the construction and operational phases (if EA is granted by the DFFE).

Therefore, the proposed project is consistent with national, provincial, and local planning priorities, particularly with regard to the dual imperative of securing new energy generation sources and driving job creation within the transition to a low-carbon economy.

7.3 Summary of Project Alternatives

As discussed in Chapter 5 of this EIA Report, various alternatives have been considered and assessed as part of the EIA Phase.

- **Land-Use Alternative:**
  - The current land-use is agriculture, specifically low-density small stock grazing. The project footprint has a low to medium agricultural sensitivity. The Agriculture Compliance Statement (Appendix G.1 of this EIA Report) notes that the proposed project provides an additional income source, without excluding agriculture from the land, or decreasing production. The proposed project also offers wider societal benefits. The development of the proposed project at the preferred site is more favourable than the agricultural land-use alternative.

- **Type of Activity Alternative:**
  - This relates to the generation of electricity from a renewable energy source, and in this particular case, from wind resources. The generation of electricity from a renewable energy source was the only activity considered by the Applicant and thus considered in this EIA Process. No other activity types were considered or deemed appropriate based on the expertise of the Applicant.

- **Renewable Energy Alternatives:**
  - The Project Developer is undertaking Scoping and EIA processes for a holistic renewable energy cluster consisting of both wind and solar energy facilities. For the Eland WEF specifically, local conditions are favourable for the renewable energy developments proposed by the Project Developer, as the mean wind power density map shows that the project study area falls within an area of approximately 101 – 300 W/m^2.

- **Preferred Site and Development Footprint within the site:**
  - The preferred site for the proposed WEF comprises the following farm portions:
    - Elands Fontein Farm RE/24;
  - The proposed 132 kV overhead power line within the 300 m wide assessment corridor, extends from:
    - Elands Fontein Farm RE/24; to
    - Drooge Onrust Farm RE/22.
  - At a specific (local) level, sites on the above listed farm properties were deemed suitable based on favourable site selection factors (such as land availability, wind resources, distance to the national grid, site accessibility, topography, current land use and landowner willingness).
  - A screening and site sensitivity verification exercise of the study area was undertaken by the specialist team during the Scoping Phase. This led to the identification of the Buildable Areas within the preferred site. The Buildable Areas avoid the no-go sensitivities identified by the specialists. The revised development footprint and layout were identified based on this, which also largely avoid the no-go areas, with some infrastructure allowed to traverse areas of very high and high sensitivity, and micrositing recommended in certain cases.
  - The final project layout (Figure 7.1) has been detailed and confirmed during the EIA Phase.

- **Technology Alternatives**
  - The following Battery Energy Storage Systems (BESS) technologies were assessed in the EIA Process in the specialist assessments listed in Table 7.1 below:
    - Preferred: Solid State Lithium-ion and Sodium-ion BESS; and
    - Alternative: Redox Flow BESS (RFB).
  - Table 7.1 is a summary of the findings of the BESS alternative consideration as per the relevant specialist reports.

Table 7.1: Summary of the BESS Alternatives based on Specialist Assessments

Specialist Assessment	BESS Technology Alternative
Appendix G.1: Agriculture Compliance Statement	▪ All design and technology alternatives, including the choice of Lithium-ion or Sodium-ion (preferred), and redox flow (alternative) for the BESS, will have no bearing on the significance of agricultural impacts. All will have an equal impact and are assessed as equally acceptable.
Appendix G.2: Terrestrial Biodiversity and Animal Species Assessment, and Terrestrial Plant Species Compliance Statement	▪ With Lithium-Ion BESS, the most significant hazard is the possibility of thermal runaway and the generation of toxic and flammable gases. The flammable gases generated may ignite leading to a fire which accelerates the runaway process and may spread the fire to other infrastructure and possibly set the grassland ablaze which could cause a run-a-way fire and cause extensive damage in the area if not controlled. The BESS is not located in a sensitive area, but it is located within the grassland. Accordingly, the necessary measures need to be put in place to limit potential fires, including a fire break around the facility (this is a worst-case scenario). However, as a containerised approach including the usual good practice of separation between containers, fail-safe mechanisms for early thermal runway and fire detection, as well as built-in fire suppression systems which will be applied for this project, the impacts are likely restricted to events of one container at a time, the main risks being close to the containers i.e., to transport drivers, employees at the facilities and first responders to incidents. ▪ For Redox Flow BESS, the most significant hazard is the possibility of spills of corrosive and environmentally toxic electrolyte. Several preventative and mitigative measures are proposed in the High-Level Safety, Health and Environment Risk Assessment (Appendix G.10 of the EIA Report) in order to contain potential spillage. ▪ The type of BESS technology will have limited to no influence on terrestrial biodiversity or plant and animal species; therefore, both are considered viable options. There are no fatal flaws associated with the proposed WEF BESS installation for any of the technology types considered should it be located outside high and very high sensitivities (which is the case in the current project layout).
Appendix G.3: Aquatic Biodiversity and Species	▪ The proposed BESS is placed outside of any aquatic sensitivity areas and thus the potential aquatic ecosystem impact would be very negligible for either technology [i.e. Solid State Lithium-ion or Sodium-ion BESS (i.e. preferred); and Redox Flow BESS (i.e. alternative)]. Therefore, any of the proposed BESS technologies would be acceptable.
Appendix G.4: Avifauna Impact Assessment	▪ The type of BESS technology will have no influence on avifauna; therefore, both the preferred (i.e. Lithium-Ion or Sodium-Ion (Solid state)) and alternative (Redox Flow) BESS technologies are considered viable from an avifaunal perspective. The impacts of habitat transformation and disturbance associated with the BESS are covered in Section 6 of the Avifauna Impact Assessment.
Appendix G.5: Visual Impact Assessment	▪ From a visual perspective, the BESS technologies vary in their design and visual characteristics, which may influence their integration into the surrounding landscape. ▪ The preferred alternative of lithium-ion and sodium-ion (solid-state) systems are typically containerised, compact, and modular in form, often resembling standard shipping containers, which can be efficiently arranged and screened through landscaping or architectural treatments. In contrast, redox flow BESS generally require larger tanks and auxiliary infrastructure, resulting in a bulkier footprint and potentially greater visual intrusion. The scale, layout, and material finishes of each technology therefore directly affect the degree of visual impact and the effectiveness of mitigation measures. ▪ No dedicated viewshed analyses were generated for the proposed BESS technology alternatives, as the range of visual exposure will fall within (and be overshadowed by) that of the turbines. Additionally, the visual impact of both of the preferred and alternative technology fall within the assessment undertaken for Ancillary Infrastructure in the Visual Impact Assessment, which is expected to be of high significance pre-mitigation and may be mitigated to moderate significance. ▪ While both of the proposed BESS technology alternatives are acceptable from a visual perspective, the preferred technology alternative of lithium-ion and sodium-ion (solid-state) system would be the preferred alternative from a visual perspective based purely on its more compact and modular form, which would be easier to mitigate.
Appendix G.6: Heritage Impact Assessment	▪ The type of technology (i.e. Lithium-Ion or Sodium-Ion (Solid state) – preferred; and Redox Flow - alternative) will have no influence on heritage impacts. Therefore, either BESS technology option would be suitable from a heritage perspective.

Specialist Assessment	BESS Technology Alternative
(Archaeology and Cultural Landscape)	
Appendix G.7: Palaeontology Impact Assessment	▪ The type of technology (i.e. Lithium-Ion or Sodium-Ion (Solid state) – preferred; and Redox Flow - alternative) will have no influence on palaeontological impacts. Therefore, either BESS technology option would be suitable from a palaeontological perspective.
Appendix G.8: Socio-Economic Impact Assessment	▪ The type of technology (i.e. Lithium-Ion or Sodium-Ion (Solid state) – preferred; and Redox Flow - alternative) will have no influence on socio-economic environment. Therefore, both are considered viable from a socio-economic perspective.
Appendix G.9: Traffic Impact Assessment	▪ Either BESS technology type (i.e. Lithium-Ion or Sodium-Ion (Solid state) – preferred; and Redox Flow - alternative) is acceptable from a traffic impact perspective. The calculation for delivery of material to the proposed development are based on Lithium-Ion BESS technology, as this is the most prevalent technology currently used and the one for which the most information is available. In this case, the BESS consists mainly of purpose-made steel containers, in which the batteries are stored and managed, together with inverters and transformers. Approximately 290 trips are estimated to be required over a period of three months. The increase in traffic volume resulting from this activity is estimated to be in the order of six return trips per day. Over an eight-hour day, this equates to 1.5 vehicles per hour. Due to the size of the vehicles delivering this material, the most likely route for these deliveries to the proposed development will be via Loxton on the TR05801 and DR02315.
Appendix G.10: Battery Energy Storage System (BESS) High Level Safety, Health and Environment (SHE) Risk Assessment	▪ There are no fatal flaws associated with the proposed BESS installation for any of the technology types considered. There is no specific preference for a type of technology (i.e., a solid state installation (e.g. lithium or sodium based) versus a redox flow BESS installation is equally preferred from a SHE risk perspective).
Appendix G.11: Geotechnical Impact Assessment	▪ For Redox Flow BESS, various chemical compositions are likely, such as Vanadium. It is important to note that the choice of technology will not be influenced by geotechnical factors, thus all options (i.e. Lithium-Ion or Sodium-Ion (Solid state) – preferred; and Redox Flow - alternative) are considered suitable from a geotechnical standpoint.
Appendix G.12: Bat Impact Assessment	▪ The type of technology (i.e. Lithium-Ion or Sodium-Ion (Solid state) – preferred; and Redox Flow - alternative) will have no influence on bat impacts. Therefore, either BESS technology option would be suitable from a bat perspective.
Appendix G.13: Noise Impact Assessment	▪ The type of technology (i.e. Lithium-Ion or Sodium-Ion (Solid state) – preferred; and Redox Flow - alternative) will have no influence on noise impacts. Therefore, either BESS technology option would be suitable from a noise perspective.

- All BESS alternatives were found to be acceptable for development to support the proposed WEF. However, due to the risk of electrolyte spillage associated with the storage tanks of RFB, as well as technological advancements associated with solid-state BESS, the sealed solid-state BESS options (namely, Lithium-ion and Sodium-ion) are selected as the preferred BESS technology and is recommended for approval (should EA be granted).

- **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 Eland WEF. This alternative would result in no environmental impacts (positive or negative) on the preferred site or surrounding local area. The no-go alternative was assessed by the specialists on the project team, where required. Table 7.2 is a summary of the findings of the no-go alternative consideration as per the relevant specialist reports.

Table 7.2: Summary of the No-Go Alternative based on Specialist Assessments

Specialist Assessment	No-Go Alternative
Appendix G.1: Agriculture Compliance Statement	▪ The no-go alternative considers impacts that will occur on the agricultural environment in the absence of the proposed development. The one identified potential impact is due to irregular rainfall, which is likely to be exacerbated by climate change, agriculture in the area will come under increased pressure in terms of economic viability. The development compliments agriculture by providing an additional income source, without excluding agriculture from the land, or decreasing production. Therefore, the negative agricultural impact of the no-go alternative is more significant than that of the development, and so, purely from an agricultural impact perspective, the proposed development is the preferred alternative between the development and the no-go. In addition, the no-go option would prevent the proposed development from contributing to the environmental, social, and economic benefits associated with the development of renewable energy in South Africa.
Appendix G.2: Terrestrial Biodiversity and Animal Species Assessment, and Terrestrial Plant Species Compliance Statement	▪ The no-go alternative means the project does not get developed and no transformation or disturbance of topsoil and vegetation takes place, and no removal of provincially protected species is required. The baseline conditions signify the Eastern Upper Karoo, which will remain as is with all current impacts still present, including livestock pens, waterpoints, windpumps, alien invasive species, fences and existing infrastructure. Furthermore, impacts on ecosystem functions including biodiversity protection, water regulation, quantity and quality, protection of medicinal plants, and climate refugia habitats will not be impacted on, and will continue as normal. ▪ Should the development not proceed, the landowners will continue to utilise the low shrubland and riverine areas (baseline - dominant land use) for grazing and other agricultural purposes and creates an opportunity for the land to be used for other means, should the landowner, for example, wish to do other developments on site. Any development considered for this site, should result in a net benefit to society and should avoid undesirable negative impacts. ▪ It must be noted, however, that not approving the project does not exclude other renewable energy projects from being developed in this area. Accordingly, since this area is not considered an exclusion zone for development, multiple applications for renewable energy are likely to be submitted to the competent authority for approval considering the location of the site. Therefore, the no-go alternative cannot be looked in isolation and must take into account the regional land use and other developments to determine the 'sense of place' and whether this development will significantly impact on the baseline conditions in a regional context. The Terrestrial Biodiversity and Species Specialist rated all identified potential impacts of the proposed project on terrestrial biodiversity and species as low significance with mitigation, and no fatal flaws were identified in the assessment provided that all mitigation measures are implemented.
Appendix G.3: Aquatic Biodiversity and Species	▪ The status quo would prevail if the no-go alternative were adopted. In this instance, potential very low significance impacts on aquatic ecology would be avoided should the no-go alternative be selected. With that being said, no fatal flaws were discovered during the aquatic biodiversity investigations for the proposed WEF.
Appendix G.4: Avifauna Impact Assessment	▪ The no-go alternative would result in no environmental impacts (positive and negative) on the preferred site or surrounding local area, because of the proposed project. The no-go alternative is not preferred. No fatal flaws were identified in the assessment.
Appendix G.5: Visual Impact Assessment	▪ Should the proposed WEF not be undertaken then no visual impact is expected as the status quo of the receiving environmental shall remain unchanged. However, no fatal flaws or unacceptable impacts were identified in the Visual Impact Assessment.
Appendix G.6: Heritage Impact Assessment (Archaeology and Cultural Landscape)	▪ If the construction of the proposed WEF were not to go ahead, there would be no new impacts to heritage resources, and the impact significance would remain neutral. Although the heritage impacts likely to arise from the proposed project would be greater than the existing, negligible, agriculture-related impacts, the loss of socio-economic benefits is more significant and suggests that the no-go option is less desirable from a heritage perspective.
Appendix G.7: Palaeontology Impact Assessment	▪ If the proposed project was not implemented, then the study area would stay as it currently is (impact significance of neutral in most cases). Although the palaeontology impacts would generally be greater than the existing impacts, the loss of socio-economic benefits is more significant and suggests that the no-go option is less desirable from a palaeontology perspective. Furthermore, the specialist noted that potential negative impacts on fossils would be partially offset by a positive outcome, as the regional palaeontological database would be enhanced by

Specialist Assessment	No-Go Alternative
	any newly discovered, well-recorded, and suitably curated fossil material recovered during the construction phase.
Appendix G.8: Socio-Economic Impact Assessment	▪ If the proposed project is not authorised, then the impacts or benefits identified in the Socio-Economic Impact Assessment will not materialise. The proposed project has significant socio-economic benefits at the local and regional scale, together with national scale benefits due to the contribution of green energy generation to the national grid. An estimated total capital expenditure (CapEx) of approximately R 6.75 billion for the 270 MW Eland WEF, was used in the Socio-Economic Impact Assessment. Further, the Socio-Economic Impact Assessment estimated the operational expenditure (OpEx) at R 114 million per annum for the 270 MW Eland WEF (assuming power generation of 710 GWh per annum). These benefits outweigh the potential negative socio-economic impacts. From a socio-economic perspective, the no-go alternative is thus considered less desirable than proceeding with the project.
Appendix G.9: Traffic Impact Assessment	▪ If the proposed development does not materialise, the increase in the traffic volume will not transpire, resulting in the following impacts: o Road Degradation: Less traffic on the roads means that the rate of degradation of the roads will be less. However, the maintenance of the roads will not be augmented by the proposed development. Improved maintenance of the roads will improve the quality of life for the road users and could increase the economic opportunities in the area. o Road Safety: Less traffic on the roads means less probability of an incident, reducing the likelihood of a fatality. ▪ The improved road maintenance counteracts the negative impacts on the public road network due to the development and economic prospects the development will bring to the local community and the impact the development has on a national scale. No fatal flaws were identified in the Traffic Impact Assessment.
Appendix G.10: Battery Energy Storage System (BESS) High Level Safety, Health and Environment (SHE) Risk Assessment	▪ The no-go alternative is not required to be assessed based on technical nature of the study.
Appendix G.11: Geotechnical Impact Assessment	▪ If the proposed development does not go ahead, there will be no need for displacement and/or loss of topsoil in the area. Considering the type of agricultural practices in the region, it is expected that little disturbance to the subsoils and rocks in the area proposed for development has taken place. For this reason, the no-go alternative is considered as low significance. However, the potential impacts of the proposed project from a geotechnical perspective are not considered to be very significant, especially if the recommended mitigation measures are adopted.
Appendix G.12: Bat Impact Assessment	▪ The impact on bats already existing in the area would be negligible if the WEF is not constructed – as no change is anticipated to occur. The no-go alternative is preferred from a bat impact perspective, although it is considered acceptable for the WEF to be constructed (with strict mitigation measures) to facilitate sustainable development.
Appendix G.13: Noise Impact Assessment	▪ The no-go alternative was not modelled as there will be no noise impact if the site is not developed. If the development does go ahead, the predicted noise impacts resulting from the proposed development are considered acceptable, furthermore renewable energy such as the proposed WEF, is required to address climate change and assist with the energy crisis in South Africa.

- As outlined in Section 7.4 and Section 7.5 of this chapter, the majority of the negative direct and indirect impacts identified as part of this assessment can be reduced to low or very low significance with the implementation of mitigation measures. None of the specialists found that the proposed project should not go ahead i.e. no fatal flaws were identified.
- Therefore, while the “no-go” alternative will not result in any negative environmental impacts because of the proposed project; it will also not result in any positive community development or socio-economic benefits. It will not assist government in addressing

climate change commitments and reaching its targets for reduced carbon emissions. Furthermore, it will not assist in generating the additional electricity that is urgently required to address the shortage of generation capacity in the country. Hence the "no-go" alternative is not a preferred alternative, or a reasonable and feasible alternative considered in this Scoping and EIA Process.

7.4 Specialist Impact Assessment

Based on the detailed specialist studies, various potential impacts have been identified. A summary of the main impacts identified is provided in Table 7.3. Note that several mitigation measures have also been provided by the specialists, however only selected key measures are noted in the table below. In general, some of the mitigation measures of the most significant impacts (post-mitigation) have been included in the table below. The specialist studies included in Appendix G of this EIA Report, and the overall impact assessment in Chapter 6 of this EIA Report, contain all the detailed mitigation measures. The recommended mitigation measures have also been included in the EMPrs in Appendix H of this EIA Report.

Table 7.3: Summary of Key Impacts that were identified and assessed during the EIA Phase as part of the Specialist Assessments, including key recommended mitigation measures

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
Appendix G.1: Agriculture Compliance Statement	**Negative Impacts:** **Construction, Operational and Decommissioning Phases:** ▪ Loss of agricultural production potential due to exclusion of agriculture from land directly occupied by development infrastructure. **Construction and Decommissioning Phases:** ▪ Loss of agricultural production potential due to soil degradation, which includes soil erosion and loss of topsoil. **Positive Impacts:** **Operational Phase:** ▪ Increase in agricultural production potential due to increased financial security for farming operations through rental income generation during the operational phase of the WEF. ▪ Increase in agricultural production potential through an improved road network, with associated storm water handling system. **Negative Cumulative Impacts:** ▪ Operational Phase: Regional loss (including by degradation) of future agricultural production potential.	**Planning Phase:** ▪ Design an effective storm water management control system, which will prevent erosion, at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points, and it must prevent any potential down slope erosion. **Construction Phase:** ▪ Implement an effective storm water management control system (as specified in the design phase). ▪ Any excavations done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 20 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it is at the surface. ▪ Topsoil should only be stripped in areas that are excavated. ▪ Across most of the site, including construction laydown areas, it will be much more effective for rehabilitation to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire cut surface. **Operational Phase:** ▪ Maintain the storm water run-off control system. Monitor erosion and remedy the storm water control system in the event of any erosion occurring. ▪ Facilitate re-vegetation of denuded areas throughout the site. **Decommissioning Phase:** ▪ 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.
Appendix G.2: Terrestrial Biodiversity and Terrestrial Animal Species Assessment,	**Negative Impacts:** **Construction Phase:** ▪ Loss of natural habitat and sensitive features, and fragmentation of non-threatened ecosystem, terrestrial Critical Biodiversity Area (CBA) 2, Ecological Support Area (ESA) 2 and Other Natural Area (ONA) (Western Cape Biodiversity	***Note: The significance of all identified impacts in the Terrestrial Biodiversity and Species Assessment is rated as low significance post-mitigation. Therefore, only some mitigation measures have been highlighted below for each phase.*** **Construction Phase:** ▪ Within High and Very High sensitivity areas including their buffer zones, turbines and other non-linear infrastructure such as the BESS and substation must be excluded. ▪ Micrositing should be considered for non-linear infrastructure located in provincial CBAs.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
and Terrestrial Plant Species	Spatial Plan (WCBSP)), and terrestrial CBA 1 (Northern Cape Biodiversity Spatial Plan (NCBSP)). ▪ Impacts on national and provincial protected plant species (SCC). ▪ Disturbance, loss or displacement impacts on animal SCC, especially for Riverine Rabbits and Karoo Dwarf Tortoise. ▪ Introduction and spread of alien invasive species. ▪ Increased erosion and soil compaction. ▪ Littering and general pollution. **Operational Phase:** ▪ Direct and indirect faunal disturbance and mortality. ▪ Increase in alien invasive species. ▪ Loss of species composition and diversity. ▪ Littering and general pollution. **Decommissioning Phase:** ▪ Loss of habitat. ▪ Direct and indirect disturbance and mortality of fauna. ▪ Disposal of used parts – waste management. ▪ Increased alien invasive species. **<u>Negative Cumulative Impacts:</u>** **Construction and Decommissioning Phases:** ▪ Loss of CBAs, natural vegetation and sensitive features. **Construction, Operational and Decommissioning Phases:** ▪ Loss and/or displacement of plant and animal SCC. ▪ Increased alien invasive species.	▪ For non-linear infrastructure, the Watercourse habitat should be avoided as far as possible as per the sensitivity map compiled for Terrestrial Biodiversity. In addition, refer to the Aquatic Biodiversity Assessment where the watercourse is delineated, mapped and suitable buffers recommended by the Aquatic Biodiversity specialist. ▪ Rehabilitate disturbed areas that are no longer required for the operational phase of the development. ▪ A comprehensive Plant Search and Rescue must be undertaken for the approved layout by a suitably qualified botanical specialist prior to vegetation clearance and disturbance. ▪ Where the approved layout designs impact on provincially protected individuals, permit applications are required for either the relocation or destruction of provincially protected species (Western Cape Biodiversity Act, 2021 (Act 6 of 2021), in terms of section 62 of the Nature Conservation Ordinance (as amended), and the 2009 Northern Cape Nature Conservation Act). ▪ Search and rescue for sensitive animal species before areas of intact vegetation are cleared and ongoing during construction, as required. This should be conducted by relevant experts with experience in search and rescue of the faunal groups concerned. ▪ Speed restrictions (40 km/hour is recommended) should be in place to reduce the amount of dust caused by vehicle movement along the roads, and to reduce possible fauna fatalities with vehicle collisions. ▪ In areas where Riverine Rabbits and Karoo Dwarf Tortoise are likely active, reduce speed limits to 30 km/hour and place appropriate signage next to the road to indicate sensitive areas. ▪ Any overhead cabling with associated pylons within and near (within 1 km) areas of suitable habitat should be designed so as to discourage crows from nesting on the structures and preying on Karoo Dwarf Tortoise. ▪ No additional water sources should be provided: construction of dams or water storage must be prohibited or enclosed in a container without leaks. Artificial surfaces should be constructed in a manner to avoid the pooling of rainwater, with suitable drainage designs. Unused dams should be dismantled. ▪ Fences should be constructed in such a way so that burrowing animals can still gain access. Electrified fences must not have active wires below 20 cm from ground level and a guard wire set at 20 cm can be used to keep larger tortoises away from the fence. ▪ Ground clearing and the digging of trenches should ideally not take place during the dry season (typically June to September), in order to minimise the impacts of dust. Where this is not possible, the appropriate dust suppression measures must be implemented. ▪ Alien vegetation, within the development footprints, should be removed from the site and disposed of at a registered waste disposal site. ▪ Rehabilitate new vehicle tracks and areas where the soil has been compacted as soon as possible after use. ▪ The site camp must not be located in very high and high sensitivity areas and their buffer zones. ▪ Dangerous goods may not be stored within 100 m of a watercourse. ▪ Ablution facilities must be located outside sensitive areas and their buffer zones.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		Operational Phase: ▪ Reduce the presence of human activity on the project area as far as possible by only focusing on the areas where operational tasks are required. ▪ Persecution of fauna species must be reduced through education and awareness campaigns. No physical harm, collection or hunting to any species may occur. ▪ Minimise use of infrastructure that could be used for nesting and making structures less suitable by selecting specific designs or using perch deterrents. ▪ Corvid (crows and ravens) censuses must be included in the avifauna operational monitoring programme, and if corvid populations show large increases, then additional measures such as nest removal and humane euthanising of corvids must be considered and implemented (this will require an ornithologist and possible permits). ▪ If trends or patterns emerge from the data (e.g., high incidence of tortoise mortality), appoint a suitably qualified specialist to develop and implement corrective actions. ▪ In areas where Riverine Rabbits and Karoo Dwarf Tortoise are likely active, reduce speed limits to 30 km/h and place appropriate signage next to the road to indicate sensitive areas. ▪ Movement barriers installed in the construction phase must be monitored and maintained weekly to ensure that they are accessible, clean and fully functional. This can be adapted to biweekly or monthly, depending on the outcomes of the construction phase data and recommendations made. ▪ Equipment with low noise emissions must be used to not disrupt ecological life cycles (breeding, migration, feeding) of animals. Do not unnecessarily disturb faunal species, especially during the breeding season. ▪ Implement appropriate rehabilitation measures to return all disturbed habitats to sustainable, productive use that was representative of the respective vegetation type prior to the commencement of construction. ▪ The site-specific alien and invasive species (AIS) Management Plan must be implemented for the first year of the operational phase. Thereafter, alien vegetation must continue to be monitored and eradicated annually throughout the life of the project. ▪ All waste must be disposed of properly and not stored or disposed of in open dumps where birds can forage. ▪ Vehicles must be in good working condition, with no oil, water or fuel leaks. ▪ All vehicles must be regularly inspected, and any problems corrected. **Decommissioning Phase:** ▪ The vegetation composition, especially within suitable rocky habitat and surroundings, must be rehabilitated to promote foraging habitat available for the Karoo Dwarf Tortoise. Accordingly, rehabilitation efforts cannot just focus on reseeding grasses but must also include replacement of forb and succulent diversity, appropriately. ▪ All infrastructure associated with the project must be dismantled and removed to reduce suitable nesting and perching habitat for corvids. ▪ Pending outcome of corvid censuses included in the avifauna operational monitoring, additional measures might be required. ▪ Decommissioning works should avoid sensitive breeding/migration periods where possible.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		▪ Prepare a Waste Inventory during decommissioning to categorise materials into the various categories. ▪ Dismantled parts must be reused, repurposed or recycled where possible. ▪ Recover copper and aluminium wiring for recycling. ▪ Where feasible, foundations should be partially removed (at least cut to 1 m below ground) to allow topsoil cover and vegetation re-establishment. ▪ Follow an alien and invasive species control and monitoring plan in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004, as amended) (NEMBA) by implementing appropriate control methods during and after decommissioning.
Appendix G.3: Aquatic Biodiversity and Species	**Negative Direct and Indirect Impacts:** **Construction Phase:** ▪ Direct Impact: Decrease in habitat integrity. ▪ Direct Impact: Decrease in aquatic ecosystem integrity (removal or loss of aquatic vegetation). ▪ Direct Impact: Reduced water quality, including increased sedimentation and risks of contamination of surface water runoff. ▪ Indirect Impact: Decrease in aquatic ecosystem integrity (alien vegetation infestation). ▪ Indirect Impact: Stress on a water resource. ▪ Indirect Impact: Road crossing structures may impede flow in the aquatic features. **Operational Phase:** ▪ Direct Impact: Decrease in aquatic ecosystem integrity (ongoing disturbance). ▪ Indirect Impact: Decrease in aquatic ecosystem integrity (disturbance of cover vegetation and soil). ▪ Indirect Impact: Modified hydraulics in the watercourses as a result of any structures associated with the proposed road crossings through the watercourses. ▪ Indirect Impact: Alien vegetation invasion in aquatic features. ▪ Indirect Impact: Stress on a water resource. **Decommissioning Phase:** ▪ Direct Impact: Increased disturbance of aquatic habitat due to the increased activity on the site.	***Note: The significance of all identified impacts in the Aquatic Biodiversity and Species Assessment is rated as very low significance post-mitigation. Therefore, only some mitigation measures have been highlighted below for each phase.*** **Construction Phase:** ▪ Implement recommended development setbacks to minimise any works within and disturbance of aquatic ecosystems (and their buffers). ▪ Water use for construction should be minimised as much as possible. The water should be obtained from a lawful and existing water allocation or other viable water sources for construction purposes. ▪ The road crossing structures should be properly designed to not impede flow in watercourses, cause blockages or erosion - low water crossing is preferred. Use existing crossings, as best as possible and where allowable. ▪ Avoid disturbing aquatic habitats as far as possible. Rehabilitate disturbed aquatic habitats once construction works are complete and revegetate them with suitable local indigenous vegetation if required. ▪ Construction materials brought onto the site should be certified as free of alien plant seed. Sources of alien seed should be prevented from being brought onto the site with imported materials. ▪ Undertake monitoring for the growth of alien vegetation during the construction and post-construction phase. ▪ Any works within aquatic features should be undertaken in the dry season where possible. ▪ Sediment traps should be installed and maintained where necessary. ▪ Construction sites and laydown areas should be located within the assessed buildable areas, and should be placed at least 35 m away from the delineated aquatic features. ▪ Good housekeeping and site management measures must be implemented at the laydown areas and the construction site as per the project EMPr and monitored by the appointed Environmental Control Officer (ECO). **Operational Phase:** ▪ The areas of high aquatic sensitivity should be treated as no-go areas for the WEF footprint and hardened areas, whereas and the areas of medium sensitivity should be avoided but can be developed with mitigation (i.e. limit the placement of infrastructure in areas of medium aquatic sensitivity as far as possible). ▪ 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.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	▪ Indirect Impact: Increased sedimentation and risks of contamination of surface water runoff. **<u>Negative Cumulative Impacts:</u>** **Construction and Decommissioning Phases:** ▪ Increased disturbance of aquatic habitat due to the increased activity in the wider area. **Operational Phases:** ▪ Degradation of ecological condition of aquatic ecosystems.	▪ Access project infrastructure using existing roads and access tracks established during the construction phase. ▪ Implement and adhere to a Stormwater Management Plan for the proposed development that addresses the stormwater runoff from the developed areas. ▪ Any new structures within the watercourses associated with the proposed project must not impede flow, or fragment the aquatic habitats, in the watercourses. ▪ A sustainable water supply should be used. **Decommissioning Phase:** ▪ Minimise works within aquatic ecosystems. ▪ Laydown areas should be placed within approved WEF footprint and layout. ▪ Rehabilitate and revegetate disturbed areas, where required. ▪ Mitigation and follow-up monitoring of alien vegetation growth and erosion may be required. ▪ The road network should be returned to that resembling pre-construction, with all additional roads removed where possible.
Appendix G.4: Avifauna Impact Assessment	**<u>Negative Impacts:</u>** **Construction Phase:** ▪ Displacement of avifauna from the area due to disturbance as a result of noise and movement associated with the construction activities. ▪ Total or partial displacement of avifauna due to habitat loss/transformation associated with the construction and presence of the wind turbines, associated infrastructure, and 132 kV power line. **Operational Phase:** ▪ Bird mortality due to collisions with the wind turbines. ▪ Bird mortality due to electrocutions of priority species in the on-site substation complex and on the overhead sections of the internal 33 kV cables. ▪ Bird mortality of power line sensitive species due to collisions with the 33 kV overhead lines (if any) and the 132 kV overhead power line. **Decommissioning Phase:** ▪ Displacement of avifauna from the area due to disturbance (noise and movement) associated with the decommissioning activities.	**Construction Phase:** ▪ Vehicle and pedestrian access to the site should be controlled and restricted to the construction footprint to prevent unnecessary destruction of vegetation. ▪ Vegetation clearance must be limited to what is absolutely necessary and in adherence to rehabilitation measures. ▪ The mitigation measures put forward by the Aquatic, and Terrestrial Biodiversity Specialists must be strictly implemented, especially as far as limitation of the activity footprint is concerned. **Operational Phase:** ▪ No turbines are to be located in the buffer zones as indicated in the sensitivity map included in the Avifauna Impact Assessment. ▪ All wind turbines must have one or two blades patterned according to a South African Civil Aviation Authority (SACAA) approved pattern and the latest guidance on blade patterning as published by BirdLife South Africa (BLSA) to reduce the risk of avian collisions. The current guideline is included in Appendix I of the Avifauna Impact Assessment (which is included in Appendix G.4 of this EIA Report). ▪ The results of the pre-construction monitoring must guide the layout of the turbines, especially as far as proposed no-turbine zones are concerned. No turbines must be located in the buffer zones which were identified based on the results of the pre-construction monitoring, with a specific view to limit the risk of collisions to a variety of birds, including several Red Data species. Note that the current layout has taken these buffer zones into consideration. ▪ It is recommended that the minimum tip height of the turbine blades should be at least 25 m, preferably higher, as low flying birds are at greater risk of turbine collisions if the lower tip height is too low. The disturbance factor would be greater too, especially for ground nesting birds. ▪ Formal live-bird monitoring and carcass searches should be implemented in the operational phase, as per the most recent edition of the Best Practice Guidelines at the time (Jenkins et al. 2015) to assess collision rates.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	Negative Cumulative Impacts: **Construction Phase:** ▪ Total or partial displacement of avifauna due to habitat loss/transformation associated with the construction and presence of the Renewable Energy Projects and their associated Grid Connections. **Construction and Decommissioning Phases:** ▪ Displacement of avifauna from the area due to disturbance as a result of noise and movement associated with the construction and decommissioning activities of the Renewable Energy Projects and their associated Grid Connections. **Operational Phase:** ▪ Mortality of avifauna due to collisions with the wind turbines. ▪ Mortality of avifauna due to electrocutions on the overhead sections of the internal medium voltage networks and in the substation yards. ▪ Mortality of avifauna due to collisions with the medium voltage overhead lines and/or high voltage overhead power lines (grid connections).	▪ A Biodiversity Management Plan (BMP) must be compiled for the site prior to commercial operation, and potential biological removal (PBR) values for all priority avifaunal species on-site must be determined. The BMP must define acceptable mortality thresholds for species of conservation concern, using the best information on population estimates, trends, Red Data status and guidelines available at the time. If fatality numbers exceed annual thresholds, additional mitigation measures must be implemented as part of the adaptive management strategy. The choice of additional mitigation measures will be dependent on the measures in place at the time and could involve the implementation of Shutdown on Demand (SDoD) measures or selective curtailment of specific turbines during high-risk periods. ▪ Phosphorescent-type Bird Flight Diverters (BFDs) must be fitted in a staggered configuration (on the earth wire and conductor) to all overhead lines for the full length according to the applicable Eskom Engineering Instruction (5 m apart for medium voltage power lines and 15 m apart for high voltage power lines). These devices must be installed as soon as the conductors are strung. ▪ Conduct quarterly inspections of all overhead sections of the medium voltage power lines as well as the 132 kV overhead power line to look for bird carcasses and to ensure that BFDs are still intact and functioning correctly. ▪ Any bird fatalities should be recorded as part of the post-construction avifaunal monitoring reports. **Decommissioning Phase:** ▪ 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.
Appendix G.5: Visual Impact Assessment	**Negative Direct Impacts:** **Construction Phase:** ▪ Visual impact of construction activities on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF. ▪ Visual impact of construction activities on observers travelling along roads within 5 km of the proposed WEF. **Operational Phase:** ▪ Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5 km of the proposed WEF.	**Planning Phase:** ▪ Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. ▪ Existing roads should be utilised wherever possible. New roads should be planned to take due cognisance of the topography to limit cut and fill requirements. Construction/upgrade of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. ▪ In terms of onsite ancillary buildings and structures, it is recommended that it be planned so that the clearing of vegetation is minimised. This implies consolidating this infrastructure as much as possible and making use of already disturbed areas rather than undisturbed sites wherever possible. ▪ It is recommended that no turbines should be placed within 1 km of any homesteads, unless otherwise agreed upon by the affected landowner, even if the landowner is located within the development site. Proof of such agreement is required. Note that such agreement has been obtained from the affected landowner and included as an appendix to the Visual Impact Assessment.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	▪ Visual impact on observers travelling along the roads within 5 km of the proposed WEF. ▪ Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 5-10 km of the proposed WEF. ▪ Visual impact on observers travelling along roads within 5-10 km of the proposed WEF. ▪ Visual impact on residents of homesteads and visitors to tourist accommodation (if present) within 10-20 km of the proposed WEF. ▪ Visual impact on observers travelling along roads within 10 – 20 km of the proposed WEF. ▪ Visual impact on residents of homesteads and visitors to tourist accommodation (if present) located beyond the 20 km radius of the proposed WEF. ▪ Visual impact on visitors to the formally protected Karoo National Park located beyond 20 km of the proposed WEF. ▪ Visual impact of shadow flicker on sensitive visual receptors in close proximity to the proposed WEF. ▪ Visual impact of lighting at night on residents and visitors to homesteads and tourist accommodation within 10 km of the proposed WEF. ▪ Visual impact of lighting at night on observers travelling along roads within 10 km of the proposed WEF. ▪ Visual impact of the ancillary infrastructure on observers in close proximity to the structures. ▪ Visual impact of blade painting on the overall perception of the WEF by sensitive receptors especially within 0-5 km and potentially up to 10 km radius of the wind turbine structures. **Decommissioning Phase:** ▪ Visual impact of decommissioning activities on sensitive visual receptors within 5 km of the proposed WEF.	▪ Ensure the application of blade painting is undertaken during the manufacturing process and not as an after application during the construction phase. **Construction Phase:** ▪ Ensure that vegetation is not unnecessarily cleared or removed during the construction period. ▪ Reduce the construction period through careful logistical planning and productive implementation of resources. ▪ Ensure that the placement of laydown areas and any potential temporary construction camps are within the areas planned in order to minimise vegetation clearing (i.e. in already disturbed areas). ▪ Ensure that rubble, litter, and disused construction materials are appropriately stored and then disposed of regularly at licensed waste facilities. ▪ Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent). ▪ Restrict construction activities to daylight hours whenever possible in order to reduce the visual impacts associated with lighting. ▪ Rehabilitate all disturbed areas immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications. **Operational Phase:** ▪ Ensure that the maintenance of the turbines and ancillary structures and infrastructure must be undertaken to ensure that the facility does not degrade, therefore aggravating the visual impact. ▪ Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as and when required. ▪ Monitor rehabilitated areas for rehabilitation failure or concerns and implement remedial action as and when required. ▪ Implement post-construction monitoring to evaluate both avifaunal effectiveness and public perception of painted blades. It is suggested that this is implemented via two complementary monitoring programmes: (a) avifaunal collision monitoring to quantify mortality reduction (as specified by the avifaunal specialist), and (b) visual perception monitoring (stakeholder surveys/photo points) to assess community responses and any unforeseen visual intrusion. Use agreed metrics (e.g., raptor fatalities, local resident perception scores). **Planning and Operational Phase:** ▪ Implement needs-based night lighting if available and considered acceptable by the South African Civil Aviation Authority (SACAA). ▪ Limit aircraft warning lights to the turbines on the perimeter according to SACAA requirements, thereby reducing the overall impact. ▪ Shield the sources of light by physical barriers (walls, vegetation, or the structure itself). ▪ Limit mounting heights of lighting fixtures or alternatively use footlights or bollard level lights. ▪ Make use of minimum lumen or wattage in fixtures.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	Negative Indirect Impacts: **Operational Phase:** ▪ The potential impact on the sense of place of the region. **Negative Cumulative Impacts:** **Operational Phase:** ▪ The potential cumulative visual impact of wind farms, solar farms and EGI on the visual quality of the landscape.	▪ Make use of down-lighters or shielded fixtures. ▪ Make use of Low-Pressure Sodium lighting or other types of low impact lighting. ▪ Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes. **Decommissioning Phase:** ▪ Remove infrastructure not required for the post-decommissioning use. ▪ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.

Appendix G.6: Heritage Impact Assessment (Archaeology and Cultural Landscape)	***Note: The Heritage Impact Assessment is an integrated report that addresses Archaeology, Palaeontology, Cultural Landscape and Visual. The Palaeontology and Visual Impacts in the integrated Heritage Impact Assessment are based on the dedicated Palaeontology and Visual Impact Assessments undertaken for the proposed project, described separately in this table. These have not been repeated in this section.***
	
	Negative Direct Impacts:
	
	Construction Phase:
	▪ Loss of archaeological sites and material.
	▪ Damage to or loss of packed stone structures and kraals.
	▪ Impacts to the cultural landscape.
	
	Operational Phase:
	▪ Impacts to the cultural landscape.
	
	Decommissioning Phase:
	▪ Loss of archaeological sites and material.
	▪ Impacts to the cultural landscape.
	
	Note: It is important to note that even though the impacts on archaeological sites and material during construction are rated as negative, the avoidance of significant identified sites and, where this is not possible, the recording and/or recovery, and curation of such material in a suitable institution would represent positive outcomes
		Construction Phase:
		▪ A pre-construction archaeological walkover survey of the final WEF layout must be undertaken.
		▪ Finds of archaeological material need to be reported to Heritage Western Cape (HWC) (and the South African Heritage Resources Agency (SAHRA) where applicable) and the project archaeologist.
		▪ Historic walls to be demolished are to be photographically recorded before demolition.
		▪ No-go areas must be implemented around certain stone features. These are listed below:
		  ○ 30 m buffer around JG019 (large stone-walled enclosure).
		  ○ 30 m buffer around JG001-JG003 (stockpost).
		  ○ 50 m buffer around JG016-JG018 (corbelled huts).
		  ○ 10 m buffer around GEB003 (stone cairn).
		  ○ 10 m buffer around JG010 (stone cairn).
		
		Operational Phase:
		▪ Implementation of recommendations of the Visual Impact Assessment to reduce impacts to the cultural landscape.
		
		Decommissioning Phase:
		▪ Finds of archaeological material are reported to HWC (and SAHRA where applicable) and the project archaeologist.
		▪ Implementation of recommendations of the Visual Impact Assessment to reduce impacts to the cultural landscape.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	and would enhance the regional archaeological database and contribute to the broader scientific understanding of South Africa's heritage. **Negative Cumulative Impacts:** **Construction and Operational Phases:** ▪ Impacts to the archaeology and cultural heritage resources.	
Appendix G.7: Palaeontology Impact Assessment	**Negative Direct and Cumulative Impacts:** **Construction Phase:** ▪ Loss of fossil heritage. *Note: Any residual negative impacts from fossil loss would be partially offset by a positive outcome, as any newly discovered, well-recorded, and suitably curated fossil material recovered during construction would enhance the regional palaeontological database and contribute to the broader scientific understanding of South Africa's fossil heritage.*	**Construction Phase:** ▪ Implement the Chance Fossil Finds Protocol that has been incorporated into the project EMPrs (Appendix H of this EIA Report). ▪ Implement training of accountable supervisory personnel by a qualified palaeontologist.
Appendix G.8: Socio-Economic Impact Assessment	**Negative Impacts** **Construction Phase:** ▪ Indirect Impact: Social disruption and change in social dynamics. ▪ Indirect Impact: Reduced quality of life and increased risks due to construction near residences. **Decommissioning Phase:** ▪ Direct Impact: Reduced employment and funding. **Direct Positive Impacts** **Construction Phase:** ▪ Direct Impact: Capital investment (CapEx) contributing to the national, regional and local economy. ▪ Direct Impact: Generation of employment, income and skills.	***Note: Several mitigation and enhancement measures have been identified in the assessment. The list below is only a summary of some of the recommendations.*** **Positive Impacts – Enhancement Measures:** **Construction Phase:** ▪ Source as many goods and services as far as possible from the local and regional economy (e.g. use local contractors and accommodation and equipment suppliers as far as possible and purchase perishable goods locally). ▪ Consult with existing Independent Power Producer (IPP) projects that successfully procure from local Small, Micro and Medium Enterprises (SMMEs) to share learnings, where possible. ▪ Develop, communicate and implement a fair and transparent labour and recruitment policy. ▪ Ensure diversity and gender equality in recruitment, as far as possible. ▪ Provide training to staff and service providers before and/or during the construction phase; including training on how to position themselves for other employment opportunities once construction ends. **Operational Phase:** ▪ Develop and implement a fair and transparent procurement policy. ▪ Maximise use of local skills and resources through preferential employment of locals where practicable.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	Operational Phase: ▪ Direct Impact: Operational investment (OpEx) contributing to the national, regional and local economy. ▪ Direct Impact: Generation of employment, income and skills. ▪ Direct Impact: Increased community prosperity through contributions and income from the WEF. **<u>Cumulative Positive Impacts</u>** ▪ Stimulation of economic and employment growth. ▪ Increased community prosperity through contributions and income from IPPs.	▪ Regularly engage with community stakeholders to develop meaningful strategies for community development. ▪ Define vision for economic development in consultation with communities. ▪ Develop a Governance Plan with clear governance rules for the Community Trust, including administration and trustee and beneficiary selection. ▪ Ensure that funding requirements for each project are considered in the future so that projects are viable and sustainable. ▪ Set clear goals for each project and phase out funding once these goals are achieved. ▪ Ensure regular external auditing of the Community Trust as well as supported projects. ▪ Consider auditing projects for several years after funding has ceased to ensure their benefits are sustained. **Negative Impacts – Mitigation Measures:** **Construction Phase:** ▪ Clearly publicise and implement a recruitment policy. ▪ Work together with impartial local representatives to identify local people during the recruitment process. ▪ Provide transport to site and other incentives to reduce the number of workers accommodated in Engineering, Procurement and Construction (EPC) accommodation to an absolute minimum. ▪ Consult with the municipalities regarding the capacity of existing services and infrastructure (e.g. provision of water, electricity, waste removal, sanitation and housing) to cope with additional workers brought into the area during the construction period. ▪ Consider supporting projects that improve local services and infrastructure and/or deal with social problems or conflicts through the social upliftment programme, if the need arises. ▪ Liaise with nearby residents before and during construction to inform them of construction status and discuss safety management measures to reduce security risks. ▪ Maintain a visible security presence on site. ▪ Implement a grievance mechanism during the construction phase. ▪ Communicate and implement a compensation procedure in the event of damages directly linked to the construction. ▪ Control site access. ▪ Provide transportation to site for unskilled workers. ▪ Declare areas outside of the construction site (that are on private land associated with the project) as no-go areas for construction staff. ▪ Erect and regularly inspect a boundary fence. ▪ Regularly inspect the project area and surrounding area for signs of illegal activity. ▪ Regularly clean any litter from the project area and surrounding area. **Decommissioning Phase:** ▪ Clearly communicate project duration to staff and communities. ▪ Prolong the operational life of the project as much as possible.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		▪ Assist with the sustainable administration of funds throughout the project lifetime. ▪ Assist with recommendations and referrals where possible.
Appendix G.9: Traffic Impact Assessment	**<u>Direct Negative Impacts</u>** **Construction Phase:** ▪ Increased road incidents. ▪ Road degradation. ▪ Dust. ▪ Exhaust emissions. ▪ Hydrocarbon spills. **Operational Phase:** ▪ Increased road incidents. **<u>Cumulative Negative Impacts</u>** **Construction and Operational Phases:** ▪ Construction Phase: Simultaneous construction of all renewable facilities in the Northern, Middle, Southern Clusters and associated Grid Connections (subject to an EA) as proposed by GEED, together with the operational phase of the three proposed Nuweveld Wind Farms. ▪ Operational Phase: Simultaneous operation of all renewable facilities in the Northern, Middle, Southern Clusters and associated Grid Connections (subject to an EA) as proposed by GEED, together with the operational phase of the three proposed Nuweveld Wind Farms.	**Construction Phase:** ▪ Post relevant road signage along affected routes. ▪ Create a local WhatsApp Group, notifying local road users of expected deliveries and associated routes; and for the local community and post notices of road conditions and proposed alternatives. ▪ Schedule deliveries to avoid local congestion. ▪ Identify alternative routes where possible. ▪ Request the assistance of local law enforcement, as required. ▪ A Traffic Management Plan (TMP) is to be compiled once the contractor has been appointed and all the relevant details of the construction process are known. A TMP framework has been compiled for the proposed Northern Cluster (i.e. Eland WEF and Windy Plains WEF) and has been included as an Appendix to the Traffic Impact Assessment. The contractor appointed to construct the proposed development is to use the cluster TMP as a guideline and platform for the compilation of a project specific TMP, once appointed. The TMP must consider all aspects and potential risks relating to the traffic to and on site, including motorised, non-motorised and pedestrians. ▪ Regular maintenance of the public road network must be undertaken. Specifically, contribute to the maintenance of the public roads in the area that are used by and impacted on by the proposed development/s during the construction phase of the development/s, provided this is agreed to by the relevant road authorities. The maintenance should be conducted over weekends to minimise the impact on the average construction period. Such maintenance must be undertaken with approval from the relevant local authorities. ▪ A photographic record of the road condition should be maintained throughout the various phases of the development/s. This provides an objective assessment and mitigates any subjective view from road users. ▪ Maintain continuous engagement with the Northern Cape Department of Roads and Public Works (NCDRPW) and Western Cape Department of Transport and Public Works (WCDTPW). ▪ Upgrade unpaved roads that are used by and impacted on by the proposed development/s to a suitable condition for proposed construction vehicles, provided this is agreed to by the relevant road authorities. ▪ Ensure that the roads that are used by and impacted on by the proposed development/s are left in the same or better condition, post-construction, based on approval and agreement by the relevant road authorities. ▪ Contractor to implement dust suppression in the immediate vicinity of the site where feasible. ▪ Contractor shall take into account dust impacts when activities on site are scheduled and executed. ▪ Contractor to have an emergency plan in place and spill kit available. **Operational Phase:** ▪ Reduce the number of vehicles on the roads when transporting staff during peak periods. ▪ Ensure that driver awareness and road safety training is provided. ▪ Ensure all vehicles are roadworthy, visible, adequately marked, and operated by an appropriately licenced operator. ▪ Drivers to adhere to the speed limit on the public road.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		▪ Post the speed limits along the relevant roads as approved by the road authority. ▪ Drivers not complying with speed limits shall be subject to penalties.
Appendix G.10: Battery Energy Storage System (BESS) High Level Safety, Health and Environment (SHE) Risk Assessment	Various risks were identified in terms of safety, health and the environment due to the proposed BESS. The BESS High Level SHE Risk Assessment identified risks, hazards, and consequences, such as, but not limited to: ▪ Human Health - chronic exposure to toxic chemical or biological agents. Causes - Construction materials such as cement, paints, solvents, welding fumes, truck fumes etc. Consequences - Employee / contractor illness. ▪ Human Health - exposure to noise. Causes - Drilling, piling, generators, air compressors. Consequences - Adverse impact on hearing of workers. Possible nuisance factor in nearby areas. ▪ Human and Equipment Safety - exposure to fire radiation. Causes – Involvement in an external fire. Fire involving fuels used in construction vehicles or vehicles themselves (e.g., tyre fire). Fire due to uncontrolled welding or other hot-work Consequences - Injuries due to radiation especially amongst first responders and bystanders. Fatalities unlikely from the heat radiation as not highly flammable nor massive fire. ▪ Human and Equipment Safety - exposure to fire radiation. Causes - Solid state battery containers damaged on route. Involvement in an external fire. Consequences – Injuries due to radiation especially amongst first responders and bystanders. Fatalities unlikely from the heat radiation as not highly flammable nor massive fire. ▪ Human and Equipment Safety - exposure to explosion over pressures. Causes - With solid state lithium containers, flammable gases generated by thermal run away reach explosive limits. Ignition on hot surfaces, static. Consequences - Potential fatalities amongst first responders. Damage to containers, transport trucks or other nearby items.	▪ There are numerous different BESS technologies but using one consistent technology system for the BESS installations associated with all the Genesis Beaufort West Renewable Energy Cluster Project developments would allow for ease of training, maintenance, emergency response and could significantly reduce risks. ▪ Where reasonably practicable, “state-of-the-art” battery technology should be used with all the necessary protective features, e.g., draining of cells during shutdown and standby-mode, full Battery Management System (BMS) with deviation monitoring and trips, leak detection systems. ▪ Ensure that the technical and system suggestions for managing and reducing risks, as specified in the Risk Assessment, specifically in terms of preventative and mitigative measures are included in the design. ▪ The overall design should be subject to a full Hazard and Operability Study (HAZOP) prior to finalization of the design. ▪ For the Vanadium Redox Flow BESS (VRFB) systems an end of life (and for possible periodic purging requirements) solution for the large quantities of hazardous electrolyte should be investigated, e.g., can it be returned to the supplier for re-conditioning. ▪ Prior to importing any solid-state battery containers into the country, the contractor should ensure that: o An Emergency Response Plan is in place that would be applicable for the full route from the ship to the site. This plan would include details of the most appropriate emergency response to fires both while the units are in transit and once they are installed and operating. o An End-of-Life plan is in place for the handling, repurposing or disposal of dysfunctional, severely damaged batteries, modules and containers. ▪ The site layout and spacing between Solid State BESS (SSB) containers should be such that it mitigates the risk of a fire or explosion event spreading from one container to another. ▪ In order to limit the possibility of domino failures from the BESS onto transformers and to limit direct impacts of any fire or explosion on the substation, the BESS should be separated from the substation by at least 20 m, or greater if specified in local or International Standards. ▪ In order to limit on-site risks, any office and maintenance buildings should be located at least 20 m, although preferably 50 m, from the BESS. ▪ A suitable separation distance (i.e. 500 m) between the BESS and occupied farmhouses / developments / public facilities / residences etc. needs to be implemented. Future developments in the area should take cognisance of the advised 500 m separation distance. ▪ From a high-level SHE Risk Assessment perspective, where there is a choice of alternative locations for the BESS, those that are further from water courses would be preferred. VRFB hazards are mostly related to possible loss of containment of electrolyte and solid-state systems may experience fires that may result in loss of containment of liquids or the use of large amounts of fire water which could be contaminated. The run-off should not enter watercourses directly. Ideally, the BESS should be placed at least 50 m away from known boreholes and water points, and outside of the sensitive areas identified by the Aquatic Biodiversity specialist.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		▪ Once the technology has been chosen and more details of the actual design are available, all risk assessments required under the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHS Act) should be in place (prior to commencement, after EA and other necessary approvals are granted (should such be granted)).
Appendix G.11: Geotechnical Impact Assessment	**Direct Negative Impacts** **Construction Phase:** ▪ Displacement of geologic material. Removal of rocks and other geologic materials for site levelling and grading, resulting in loss of geologic materials. ▪ Contamination of geologic materials as a consequence of the construction activities by earthworks machinery and other apparatus. **Operational Phase:** ▪ Increased unnatural hard surfaces yielding increased runoff, potentially increasing erosion. ▪ Contamination of geologic materials as a consequence of typical maintenance activities, or spillages associated with the BESS. **Decommissioning Phase:** ▪ Increased unnatural hard surfaces yielding increased runoff, potentially increasing erosion. ▪ Contamination and disturbance of geologic materials as a consequence of typical decommissioning activities. **Cumulative Negative Impacts** The same impacts described above were identified in the cumulative impact assessment for the construction, operational and decommissioning phases.	***Note: The significance of all identified direct impacts in the Geotechnical Impact Assessment is rated as very low significance post-mitigation. Therefore, only some mitigation measures have been highlighted below for each phase.*** **Construction Phase:** ▪ Favour dolerite as an aggregate (as opposed to Karoo sandstones and mudstones). This is subject to investigation. ▪ Any road cuttings should be designed by an appropriately qualified professional. ▪ Drainage on site should be designed and managed appropriately. ▪ Investigate and confirm the geotechnical suitability of each structure (or other appropriate level of investigation) prior to construction (i.e. determine that soil with an adequate bearing capacity is obtained beneath each footing). Such investigations would not be required to fulfil the requirements of this EIA process. However, it would be necessary prior to construction. ▪ Only strip vegetation necessary for the next phase of construction. ▪ Install temporary drainage to divert stormwater away from active construction activities, where required. ▪ Effective stormwater management must include effective stabilisation (e.g. gabions and Reno mattresses) of exposed soil. ▪ Where impacted through construction-related activities, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled. ▪ During the execution of the works, appropriate measures to prevent pollution and contamination of the environment must be implemented, e.g. ensuring that construction equipment is well maintained. ▪ Provision must be made for refuelling at the storage area / site camp, and workshop by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained. ▪ A spill kit should be maintained on site. If spillages occur, they should be contained and removed as rapidly as possible, with correct disposal procedures of the spilled material, as reported. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes. **Operational Phase:** ▪ Install drainage to divert stormwater away from activities, roads/tracks, and structures, where required. ▪ Implement the Stormwater Management Plan. ▪ Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used. ▪ Ensure that the BESS is assembled in line with relevant product specifications and with the necessary measures to prevent potential contamination of the surrounding environment.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		▪ For the BESS, it is recommended that any wastewater produced by fire hydrants should not be allowed to runoff into the environment, and any waste products produced from the BESS should be removed and disposed of appropriately. **Decommissioning Phase:** ▪ Only drive and park vehicles where necessary. ▪ Land rehabilitation to near natural state, i.e. removal of foundations and backfilling of any resultant voids within the soil, as well as removal of hard surfaced areas. Replacement soil should be sourced locally to ensure homogeneity. Reseed with natural vegetation and grasses to further mitigate future displacement. ▪ Reinstate natural topography where cut-to-fill embankments have been constructed. ▪ Implement generic environmental management procedures for infrastructure.
Appendix G.12: Bat Impact Assessment	**<u>Direct Negative Impacts</u>** **Construction Phase:** ▪ Displacement of bats due to habitat loss / habitat transformation. ▪ Roost Disturbance. ▪ Roost Destruction. **Operational Phase:** ▪ Mortality of bats due to turbine collisions while commuting/foraging. ▪ Mortality of bats due to turbine collisions during migrations. ▪ Light pollution associated risks including loss of insect prey and increased collision risks for bats foraging closer to turbines. **Decommissioning Phase:** ▪ Displacement of bats due to disturbance associated with the decommissioning activities. **<u>Cumulative Negative Impacts</u>** **Operational Phase:** ▪ Cumulative Bat Mortality Impacts.	**Construction Phase:** ▪ During construction, laydown areas and temporary access roads should be kept to a minimum in order to limit direct vegetation loss and habitat fragmentation. Construction of the infrastructure should, where possible, be situated in areas that are already disturbed. ▪ Limit the removal of vegetation, particularly large mature trees within 50 m of turbine positions. ▪ Potential roosts, specifically buildings and rocky crevices, must be buffered by 200 m, inside which no turbine infrastructure may be placed. No turbines should be installed within 50 m of large mature trees. *Note that no roosts were identified in the study area during the site survey. Additionally, the current layout adheres to the high sensitivity buffer zones identified by the bat specialist, as no turbines fall within the high sensitivity areas.* ▪ The WEF must be designed and constructed in such a way as to avoid the destruction of potential and actual roosts, particularly large mature trees, buildings, and rocky crevices (if blasting is required). ▪ Large mature trees within 50 m of the turbine positions should be inspected for roosting bats, and appropriate mitigation should be undertaken as recommended by a bat specialist. **Operational Phase:** ▪ Designing the layout of the project to avoid areas that are more frequently used by bats will reduce the likelihood of mortality and should be the primary mitigation measure. These areas include key microhabitats such as water features, large mature trees, buildings, and rocky crevices. These areas have been buffered by 200 m. *Note: No turbines are currently located within the buffers in the layout.* ▪ The height of the lower blade swept area must be maximised, and should try to be kept above 50 m. If the minimum blade sweep is lower than 50 m from ground level, the facility runs the risk of reaching fatality thresholds sooner. *Note that the proposed hub height is up to 200 m, whilst the proposed blade length is approximately 100 m. As such, the proposed WEF's lower blade sweep height from ground level is approximately 100 m.* ▪ Operational monitoring should be done according to the guidelines for the first 2 years and every 5 years thereafter. During this monitoring, fatality estimations would need to be evaluated every 3 – 4 months against the South African Bat Assessment Association (SABAA) fatality threshold guidelines (i.e. if they exceed an estimated 24 bat fatalities per year as per current threshold) to determine escalation of mitigation options.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		▪ Blade feathering should be implemented at the start of operation. ▪ Apply curtailment during spring, summer and autumn based on an appropriate curtailment plan and/or install acoustic deterrents (based on input from an appropriate bat specialist) if mortality occurs beyond threshold levels as determined based on applicable guidance (MacEwan et al. 2018). The threshold calculations must be done at a minimum of once a quarter (i.e. not only after the first year of operational monitoring) so that mitigation can be applied as quickly as possible should thresholds be reached. **Decommissioning Phase:** ▪ The impacts to bats during this phase are likely to be restricted to disturbance. Provided decommissioning activities are restricted to daylight hours, the impact to bats is predicted to be negligible.
Appendix G.13: Noise Impact Assessment	**Direct Negative Impacts** **Construction Phase:** ▪ Noise pollution due to construction activities (equipment and vehicle noise). **Operational Phase:** ▪ Daytime: Mechanical and aerodynamic noise from the operation of the wind turbine components. ▪ Nighttime: Mechanical and aerodynamic noise from the operation of the wind turbine components. **Decommissioning Phase:** ▪ Noise pollution due to decommissioning activities (equipment and vehicle noise). **Cumulative Negative Impacts** **Operational Phase:** ▪ Mechanical and aerodynamic noise from the operation of the wind turbine components.	**Construction Phase:** ▪ Staff to receive training on noise sensitivity. ▪ Comply with the Western Cape Noise Control Regulations published in Provincial Notice 200/2013. ▪ Monitor noise during the construction phase to confirm noise levels are within limits. ▪ Limit construction / piling to daytime. ▪ Regularly service equipment to ensure no unnecessary noise is emitted. **Operational Phase:** ▪ Conduct noise monitoring during the operational phase to determine actual noise impact and whether further mitigation measures need to be implemented. This may include operating the turbine in a low noise mode (i.e. reducing power output under certain operational conditions). ▪ Implement a 500 m buffer around all noise sensitive areas to ensure no future WTGs impact these noise sensitive areas. Note that the recommended 500 m no-go buffers have been applied and that no WTG are located within these Noise Sensitive Areas (NSAs). **Decommissioning Phase:** ▪ Staff to receive training on noise sensitivity. ▪ Monitoring of noise during the decommissioning phase to confirm noise levels are within limits. ▪ Limit decommissioning activities to daytime in order to take advantage of unstable weather conditions. ▪ Regularly service equipment to ensure no unnecessary noise is emitted.
Appendix G.16: Wake Effects	**Background:** A Wake Effects Study was undertaken with the overall objective of determining the potential impact of the energy production of the Eland WEF on the proposed surrounding WEFs within a 30 km	**Outcome of the Study:** WindPro™ calculated the theoretical reduction of yield of the Eland WEF caused by surrounding WEFs as shown in Table A below; and the theoretical reduction in yield caused by Eland WEF on surrounding projects as shown in Table B below.

<table>
<tr><th>Specialist Assessment undertaken</th><th>Key Impacts Identified</th><th>Recommended Mitigation Measures</th></tr>
<tr>
<td></td>
<td>radius; and the potential impact of the proposed surrounding WEFs on the energy production of the Eland WEF.

Wake effects could directly influence energy yields and indirectly influence aspects such as the socio-economic and enterprise development initiatives that could be made available by the WEF projects for the surrounding communities if they were to be commercialised.

There are no operational WEFs within 30 km of the proposed Eland WEF. A total of 20 proposed WEF projects have received EA within 30 km of the Genesis Northern Cluster WEFs. Note that other WEFs proposed by GEED in the Beaufort West Renewable Energy Cluster have been excluded from the wake effects study (as this is an internal yield management issue for GEED and does not influence other IPPs). Refer to Table 1 and Figure 1 of the Wake Effects Study, which is included in Appendix G.16 of this EIA Report.

The wake loss assessment completed in the EIA Phase is subject to multiple high-level assumptions as various factors still need to be confirmed, such as the final turbine layouts and turbine models for the proposed surrounding WEF projects, including the latter for the proposed Eland and Windy Plains WEFs together with pending DFFE approval of the final layout plans.

The theoretical wake impact of the Eland WEF on the surrounding projects and the theoretical wake impact of the surrounding projects on the Eland WEF was undertaken using the industry accepted wind flow modelling software, WindPro™.</td>
<td>
Table A
<table>
<tr><th>Theoretical reduction in yield caused by wake loss from the following nearby authorised WEF projects ON the Eland WEF:</th><th>Wake Loss %</th></tr>
<tr><td>• Hoogland 2</td><td>3.0 ≥ 3.5</td></tr>
<tr><td>• Hoogland 1
• Mulilo Karoo Wind Power 1
• Mulilo Karoo Wind Power 2</td><td>0.5 ≥ 1.0</td></tr>
<tr><td>• Hoogland 3
• Hoogland 4
• Nuweveld North
• Nuweveld West
• Nuweveld East
• Mulilo Karoo Wind Power 3
• Loxton
• Taaibos North
• Taaibos South</td><td>0 ≥ 0.5</td></tr>
<tr><td>• Klipkraal 1
• Klipkraal 2
• Klipkraal 3
• Klipkraal 4
• Klipkraal 5
• Soutriver North
• Soutriver Central</td><td>0.0</td></tr>
</table>
Table B
<table>
<tr><th>Theoretical reduction in yield caused by wake loss from the Eland WEF ON the following nearby authorised WEF projects:</th><th>Wake Loss %</th></tr>
<tr><td>• Hoogland 2
• Hoogland 3
• Hoogland 4
• Nuweveld North
• Nuweveld West
• Nuweveld East
• Mulilo Karoo Wind Power 3</td><td>0 ≥ 0.5</td></tr>
<tr><td>• Hoogland 1
• Mulilo Karoo Wind Power 1
• Mulilo Karoo Wind Power 2
• Klipkraal 1
• Klipkraal 2
• Klipkraal 3
• Klipkraal 4
• Klipkraal 5
• Loxton
• Taaibos North
• Taaibos South
• Soutriver North
• Soutriver Central</td><td>0.0</td></tr>
</table>
The wake loss calculation results in Table B show that while there could be a potential for Eland WEF to impact the other WEF projects through wake loss, this is expected to be by a low value. As shown in Table B, seven of the surrounding projects would experience a wake loss of zero to 0.5%.

Conversely, as shown in Table A, the surrounding projects are predicted to have a wake loss effect on the Eland WEF of 3.0 to 3.5% for Hoogland 2, 0.5 to 1.0% for a further three projects, and zero to 0.5% for a further nine projects.

Although there is the potential for a small reduction in yield that could affect socio-economic and enterprise development funding per project, the net effect of all projects contributing to the local community is considered significantly more positive and beneficial.

The potential wake loss impacts on all proposed WEFs by Eland WEF and vice versa has been recognised, and the Applicant is committed to addressing wake loss if any or all facilities are commercialised. If the wake impact assessment is updated with final turbine layouts, turbine model, hub heights and other technical considerations, then the wake impact predictions will be significantly more accurate. Only at the point of more certainty around wind farm configurations and commercialisation is it fair, equitable and market standard to conclude a Wake Loss Compensation Agreement based on the outcome of a detailed wake
</td>
</tr>
</table>

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		loss assessment. *The Wake Loss Impact Results at this stage are high-level and do not represent the actual wake loss impacts in the future sufficiently and fairly enough to be able to reach formal agreements. It is thus not reasonable and fair to conclude a Wake Loss Compensation Agreement at this stage*. As the project progresses and is prepared for commercialisation, the Applicant is committed to further engagements with potentially affected WEFs to determine potential issues and impacts of wake loss as may be required.

7.5 Summary of Key Impact Assessment Findings

Table 7.4 below provides a summary of the impact assessment for the proposed project post-mitigation for direct and indirect impacts. Table 7.5 provides the same information for the cumulative impacts. Some impacts were not identified, or are considered insignificant, or could not be measured empirically at the time of assessment.

Based on the findings of the detailed specialist impact assessments, which are included in Appendix G of this EIA Report, the following is concluded for the proposed project:

- With the implementation of mitigation measures, this project is considered to have an **overall Low to Very Low negative environmental impact, with certain moderate and high negative environmental impacts.** Specifically, **high significance** negative impacts (post-mitigation) have been identified in the Visual Impact Assessment and Traffic Impact Assessment for the construction and operational phases. Note that the relevant specialists have explained that this is not unacceptable or a fatal flaw. In addition, **moderate significance** negative impacts (post-mitigation), were identified in the Visual Impact Assessment and Heritage Impact Assessment for the construction and decommissioning phases, as well as in the Avifauna Impact Assessment and Heritage Impact Assessment for the operational phase. Refer to Table 7.4.

- With the implementation of enhancement measures, this project is considered to have an **overall Low to High positive socio-economic impact**. Refer to Table 7.4.

- The majority of the **cumulative negative impacts** were rated with a **Low and Very Low** post-mitigation impact significance for the construction, operational and decommissioning phases, with the exception of Avifauna impacts being rated as **Moderate** during the operational phase, and Visual impacts being rated as **Very High** also during the operational phase. The Visual Impact Assessment confirmed that the cumulative impact is not considered a fatal flaw as the addition of the proposed Eland WEF is not expected to contribute to the cumulative visual impact significantly. A few specialist studies found insignificant impacts or did not identify cumulative impacts for the various phases. In terms of **cumulative positive impacts**, the Socio-Economic impacts are considered highly significant (with enhancement) for the construction and operational phases, noting that if the timing of construction of different wind energy projects can smooth the employment levels and provide longer-term continuity of employment, this enhances the positive cumulative benefit. Furthermore, the socio-economic specialist notes that the projects considered in the cumulative impact assessment would cumulatively magnify the benefits and some impacts of the Eland WEF, and the risk of distorting effects is present as the area is sparsely populated and there are limited economic opportunities. Refer to Table 7.5.

Table 7.4: Overall Impact Significance with the Implementation of Mitigation Measures for Direct Negative and Positive Impacts

Specialist Study	Construction	Operational	Decommissioning
Direct Negative Impacts			
Agriculture	Low	Low	Low
Terrestrial Biodiversity and Terrestrial Animal and Plant Species	Low	Low	Low
Aquatic Biodiversity and Species	Very Low	Very Low	Very Low
Avifauna Impact Assessment	Low	Moderate / Low	Low
Visual Impact Assessment	Moderate / High	High	Moderate
Heritage Impact Assessment (Archaeology)	Very Low / Moderate	Moderate	Very Low / Moderate
Palaeontological Impact Assessment	Low	No impact	No impact
Socio-Economic Impact Assessment *Note: Construction phase socio-economic negative impacts are rated indirect.*	Very Low / Low	Insignificant and/or not identified and/or not applicable	Low
Traffic Impact Assessment	Low / High	High	TIA to be undertaken at decommissioning
Geotechnical Impact Assessment	Very Low	Very Low	Very Low
Bat Impact Assessment	Very Low	Very Low / Low	Very Low
Noise Impact Assessment	Very Low	Very Low	Very Low
Direct Positive Impacts			
Socio-Economic Impact Assessment	Moderate	Low / High	Insignificant and/or not identified and/or not applicable

Table 7.5: Overall Impact Significance with the Implementation of Mitigation Measures for Cumulative Negative and Positive Impacts

Specialist Study	Construction	Operational	Decommissioning
Negative Impacts			
Agriculture	Low	Low	Low
Terrestrial Biodiversity and Terrestrial Animal and Plant Species	Low	Low	Low
Aquatic Biodiversity and Species	Very Low	Very Low	Very Low
Avifauna Impact Assessment	Low	Moderate / Low	Low
Visual Impact Assessment	Not Applicable	Very High	Not Applicable
Heritage Impact Assessment (Archaeology)	Low	Low	Insignificant and/or not identified and/or not applicable
Palaeontological Impact Assessment	Low	No impact	No impact
Socio-Economic Impact Assessment	Insignificant and/or not identified and/or not applicable	Insignificant and/or not identified and/or not applicable	Insignificant and/or not identified and/or not applicable
Traffic Impact Assessment	Not rated specifically, however the additional traffic volume does not compromise the level of service of the roads.	Not rated specifically, however the additional traffic volume does not compromise the level of service of the roads.	TIA to be undertaken at decommissioning
Geotechnical Impact Assessment	Low	Low	Low
Bat Impact Assessment	Insignificant and/or not identified and/or not applicable	Low	Insignificant and/or not identified and/or not applicable
Noise Impact Assessment	Insignificant and/or not identified and/or not applicable	Low	Insignificant and/or not identified and/or not applicable
Positive Impacts			
Socio-Economic Impact Assessment	High (depends on the timing of implementation)	High (depends on the timing of implementation)	Not identified

7.6 Overall Environmental Impact Statement and Reasoned Opinion from the EAP

The information presented above, contributes to this overall environmental impact statement and reasoned opinion from the EAP as to whether the proposed project should or should not be authorised, including any conditions that should be made in respect of the authorisation (should it be granted).

Based on the findings of the detailed specialist assessments and technical studies, which all recommend that the proposed project can proceed and should be authorised by the DFFE, the proposed project is considered to have an **overall Low to Very Low negative environmental impact, and an overall Low to High positive socio-economic impact** (with the effective implementation of respective mitigation and enhancement measures).

The proposed project will take place within the development footprint on the preferred project site, as contemplated in the accepted Final Scoping Report. The development footprint and buildable areas largely avoid the "no-go" sensitive features identified and mapped by the respective specialists, where relevant and applicable, as discussed in Chapter 6 of this EIA Report. As noted above, in some cases, linear infrastructure traverse areas of high or very high sensitivity, however the Aquatic Biodiversity, Terrestrial Biodiversity, and Avifauna specialists have confirmed that this is acceptable with recommended mitigation measures. In addition, from a terrestrial biodiversity and species perspective, there is minor encroachment of non-linear infrastructure into provincial CBAs, and High and Very High sensitivity areas identified by the Terrestrial Biodiversity specialist. To this end, the specialist recommended that micrositing should be considered for such non-linear infrastructure.

This EIA has considered the nature, scale and location of the development as well as the wise use of land. When considering the timing of this project, the IRP 2019 proposes to secure 17 800 MW of renewable energy capacity by 2030. As discussed in the preceding chapters of this EIA Report, it is the Project Applicant's intention to bid this project in the future bidding rounds of the REIPPPP or similar tender process. The project would contribute in the order of 270 MW renewable energy generation capacity to national energy generation, which has direct and indirect benefits for national economic growth, especially when noting that wind and solar energy are the lowest cost options for new electricity generation in South Africa.

The proposed project will be in line with and will be supportive of the objective of the Beaufort West, Karoo Hoogland, and Ubuntu Local Municipalities Integrated Development Plans (IDPs) in terms of leveraging the competitive advantages of the significant renewable energy resources in the region and creating more job opportunities. If approved by DFFE, the proposed WEF will provide skills development opportunities, create contractual and permanent employment in the area, and consequently provide catalytic opportunities for downstream economic development.

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 EIA 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 EMPrs in Appendix H of this EIA Report).

The outcomes of this project therefore succeed in meeting the environmental management objectives of protecting the ecologically sensitive areas and supporting sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development in the towns nearest to the project site. The findings of this EIA show that all natural resources will be used in a sustainable manner (i.e., this project is a renewable energy project, and the majority of the negative site specific and cumulative environmental impacts are considered to be of low to very low significance with mitigation measures implemented), while the benefits from the project will promote justifiable economic and social development. Refer to Table 7.6 for a summary of reasoned opinions from the specialists.

Table 7.6: Summary of the Reasoned Opinions from the Specialists

Specialist Assessment undertaken	Reasoned Opinion on whether the project should be authorised
Appendix G.1: Agriculture Compliance Statement	▪ The overall conclusion of the Agriculture Compliance Statement is that the proposed development is desirable from an agricultural perspective because it offers a valuable, mutually beneficial opportunity for the WEF to be integrated with agricultural production in a way that provides benefits to agriculture and leads to very little loss of agricultural land with no loss of future agricultural production potential. ▪ From an agricultural impact point of view, it is recommended that the proposed development be approved. ▪ The conclusion on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions, other than the recommended mitigation discussed in the Agriculture Compliance Statement and included in the EMPrs.
Appendix G.2: Terrestrial Biodiversity and Terrestrial Animal Species Assessment, and Terrestrial Plant Species Compliance Statement	▪ Based on the assessment, no fatal flaws are expected for the proposed project. It is highly recommended that all infrastructure be positioned outside of areas classified as having high or very high sensitivity, specifically through micrositing of turbines to avoid these sensitive areas, as specified in the assessment. It is the opinion of the specialist that the project, may be considered for authorisation, on condition that all avoidance, prescribed mitigation measures and supporting recommendations are implemented. Should the layout be amended in the future, and significant changes occur which impacts on sensitive features, all necessary protocols need to be followed to ensure all highly sensitive areas are avoided.
Appendix G.3: Aquatic Biodiversity and Species	▪ All aquatic areas recommended for avoidance have been avoided in the EIA phase layout identification. Based on the findings of the specialist assessment, there is no reason from a freshwater perspective why the proposed activity (with the implementation of the recommended mitigation measures) should not be authorised.
Appendix G.4: Avifauna Impact Assessment	▪ The WEF and associated infrastructure layout has taken all avifaunal risk zones into consideration and has adequately avoided or addressed the high-risk areas. No fatal flaws were discovered during the investigations. The proposed project is supported on the condition that all mitigation measures as listed in the Avifaunal Specialist Study (Appendix G.4 of this EIA Report) are strictly adhered to.
Appendix G.5: Visual Impact Assessment	▪ Based on the Visual Impact Assessment undertaken, it is expected that the construction and operation of the proposed WEF and its associated infrastructure, will have range from very high to low visual impacts on the study area, especially within (but not restricted to) a 0 – 10 km radius (and potentially

Specialist Assessment undertaken	Reasoned Opinion on whether the project should be authorised
	up to a 20 km radius) of the proposed facility. Tourists both travelling through the region and visiting tourist facilities, observers travelling along the various roads, particularly the R381 and R356, as well as residents of homesteads will likely experience visual impacts where the wind turbine structures are visible. Overall, the significance of the visual impacts associated with the proposed WEF is expected to be high (post mitigation). ▪ In spite of certain post-mitigation significance ratings being very high to high, the Visual Impact Assessment cannot categorically state that any of the criteria that determines whether or not a visual impact constitutes a potential fatal flaw were transgressed. As such, the Visual specialist explains that the identified visual impacts are not considered to be fatal flaws. ▪ Therefore, the Visual specialist is of the opinion that the visual impacts associated with the proposed WEF are within acceptable limits when considering the nature of the proposed infrastructure from a visual perspective and can be authorised.
Appendix G.6: Heritage Impact Assessment (Archaeology and Cultural Landscape)	▪ This assessment has found that the area identified for the proposed project is a heritage environment of variable sensitivity but that significant impacts on heritage resources arising from the construction of the project are unlikely. If the project were not implemented, the site would stay as it currently is with a neutral impact significance. ▪ It is the considered opinion of the heritage specialists that provided the recommended mitigation measures are implemented, the overall impact and significance of the proposed WEF on heritage resources will be low and the proposed activity is acceptable from a heritage perspective. ▪ Therefore, it is the specialist's reasoned opinion that the proposed WEF and associated infrastructure be granted EA. The mitigation measures contained in Section 13 of the Heritage Impact Assessment are recommended for inclusion in the EA.
Appendix G.7: Palaeontology Impact Assessment	▪ It is recommended that the proposed project receive EA. The proposed WEF and associated infrastructure are not fatally flawed from a palaeontological perspective. However, the recommended mitigation measures must be included in the EMPrs, and they must be implemented in full during the construction phase.
Appendix G.8: Socio-Economic Impact Assessment	▪ The construction of the proposed project provides significant socio-economic benefits, related to economic growth and employment, and financial contributions to and upliftment of Previously Disadvantaged Individuals in rural communities. ▪ Overall, the proposed project has acceptable socio-economic impacts and desirable benefits, though careful management of benefits (governance of community funds) is critical. ▪ From a socio-economic perspective, the project should be authorised and is preferred to the no-go alternative.
Appendix G.9: Traffic Impact Assessment	▪ From a traffic impact perspective, it can be concluded that the proposed project will generate an increase in the traffic volumes on the public road network during the peak construction phase. However, this increase will be significantly less than the increase in the traffic volumes on the public road network during the peak construction phase of the developments considered in the cumulative assessment. ▪ The Traffic Impact Assessment assessed the cumulative impact of the additional traffic volumes on the surrounding public road network generated by the proposed developments and has found the level of service on the public road network to be acceptable. The current public road network is not well maintained due to budgetary constraints within various spheres of government. The increase in traffic volumes will lead to greater wear and tear of the public road network, especially during construction. However, if the relevant mitigation measures and continuous maintenance are undertaken by the Project Developer these traffic loads should not negatively affect the operability of the public road network. ▪ It is the reasoned opinion of the traffic specialist that the proposed WEF can be approved from a traffic and transportation perspective as there are no constraints

Specialist Assessment undertaken	Reasoned Opinion on whether the project should be authorised
	or notable impacts that would jeopardise the implementation of the proposed development, subject to the specific requirements included within the Traffic Impact Assessment.
Appendix G.10: Battery Energy Storage System (BESS) High Level Safety, Health and Environment Risk Assessment	▪ This Risk Assessment has found that if suitable preventative and mitigative measures are in place, none of the identified potential risks are excessively high, i.e., from a Safety, Health and Environment (SHE) risk perspective, no fatal flaws were found with any of the types of BESS technology considered in the Scoping and EIA Process. ▪ Therefore, from a SHE risk perspective, there is no reason to prohibit the development. This overall finding applies to the construction, operational and decommissioning phases. Based on the professional domain and findings of the Risk Assessment, it is the recommendation of the specialist that the project should be granted EA.
Appendix G.11: Geotechnical Impact Assessment	▪ Based on the geotechnical analysis conducted, it is recommended that the proposed project be authorised, as no fatal flaws were identified from a geotechnical standpoint. The recommended mitigation measures provided in the assessment must be implemented.
Appendix G.12: Bat Impact Assessment	▪ The data suggests that there could be a risk to bats posed by the WEF development at the site, particularly in summer, and parts of spring and autumn. Despite this, and provided the stipulated considerations are met, the development of proposed WEF is compatible with bat conservation. It is the opinion of the bat specialist team that the proposed WEF should be granted EA.
Appendix G.13: Noise Impact Assessment	▪ The construction, operational and decommissioning noise impacts will be very low significance before and after mitigation. Based on the modelling results for the cumulative operational phase, the impact will be low significance before and after mitigation, from a noise perspective. It is recommended that the proposed development receive EA.
Appendix G.14: Civil Aviation Site Sensitivity Verification	▪ The study area falls within an area of low sensitivity from a Civil Aviation perspective, and there is therefore no reason for the proposed development not to be authorised.
Appendix G.15: Defence Site Sensitivity Verification	▪ The study area falls within an area of low sensitivity from a Defence perspective, and there is therefore no reason for the proposed development not to be authorised.

Taking into consideration the findings of the Scoping and EIA Process and given the national and provincial strategic requirements for infrastructure development, particularly from an electricity generation perspective, and based on the fact that the no-go areas have been predominantly avoided, it is the opinion of the EAP, that the benefits of the project outweigh the costs and that the project will make a positive contribution to sustainable infrastructure development in the affected local and district municipalities.

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

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

It is recommended that the EA (should it be granted) be **valid for a period of 10 years**.

In addition, it is recommended that the EMPrs compiled as part of this EIA Process, included in Appendix H of this EIA Report, be approved concurrently in the EA (should it be granted). A detailed final layout of the WEF and associated infrastructure was identified during the EIA Phase and is included in this chapter of the EIA Report (i.e. Figure 7.1), as well as Appendix C and the EMPrs.

If any changes are needed to the detailed final layouts post EA (should such an authorisation be granted), the specialists have confirmed that such changes would be deemed acceptable if the changes remain within the approved buildable areas and area assessed during the Scoping and EIA Process with no-go sensitive areas avoided. Any changes can be subjected to an EA amendment process, where warranted.

7.7 Cumulative Environmental Impact Statement

The cumulative impacts have been assessed by all the relevant specialists. The cumulative assessment included other renewable energy projects and EGI within a 30 km radius of the proposed project. However, the Avifauna, Bat and Visual Impact Assessments considered a 50 km radius for the cumulative impact assessment.

No cumulative impacts have been identified that were considered to be fatal flaws. The overall cumulative impact assessment is described above in Section 7.5 and Table 7.5 of this chapter. Based on the findings of the detailed specialist assessments and technical studies, the proposed project is considered to have an overall Low to Very Low negative cumulative environmental impact, and an overall highly significant positive cumulative socio-economic impact (with the implementation of respective mitigation and enhancement measures).

It is also important to note that the proposed project site is located fairly close to the Beaufort West REDZ, which supports the development of large-scale wind and solar energy developments in the area. The proposed project is therefore linked to the national planning vision for Renewable Energy development in South Africa.

The specialists recommended that the project receive EA in terms of the 2014 NEMA EIA Regulations (as amended), including consideration of cumulative impacts, provided the mitigation is applied.

7.8 Conditions recommended for inclusion in the EA

In order to ensure the effective implementation of the mitigation measures and management actions, three EMPrs have been compiled and are included in Appendix H of this EIA Report. Appendix H includes the EMPr for the proposed WEF and associated infrastructure (Appendix H.1), the EMPr for the proposed on-site substation (Appendix H.2), and the EMPr for the proposed power line infrastructure (Appendix H.3). The EMPrs for the proposed substation and power line infrastructure are Generic EMPrs gazetted for substation development, and for the development and expansion of overhead electricity transmission and distribution infrastructure (Government Gazette 42323, GN 435, March 2019).

The mitigation measures necessary to ensure that the proposed project is planned and carried out in an environmentally responsible manner are listed in the EMPrs. The EMPrs include the mitigation measures noted in this EIA Report, inclusive of the specialist assessments and technical studies, as relevant. The EMPrs are dynamic documents that should be updated as required and provide clear and implementable measures for the proposed project.

Listed below are the main recommendations applicable to the proposed project that should be considered for inclusion in the EA (should such authorisation be granted by the DFFE). These main recommendations, as well as additional recommendations are included in the EMPr and EIA Report.

- Mitigation measures detailed within the EIA Report, specialist assessments, technical studies and EMPrs are to be implemented, where relevant and applicable.
- Conduct a walk down of the approved site prior to construction activities to record all protected plant and animal species that will be impacted on by the development footprint and in need of permits.
- Within High and Very High sensitivity areas including their buffer zones, turbines and other non-linear infrastructure such as the BESS, substation must be excluded.
- Micrositing should be considered for non-linear infrastructure located in provincial CBAs, High and Very High sensitivity areas (This applies to Turbine 5; as well as the turbine hardstands of Turbine 2, Turbine 4, Turbine 5, Turbine 20, and Turbine 21; in Figure 7.3 that shows the Combined Final Project Layout Map. For further detail, refer to Figures 34 and 35 of the Terrestrial Biodiversity and Species Assessment in Appendix G.2 of the EIA Report).
- Submit the necessary permit applications to the relevant provincial authorities prior to construction for the translocation and safe removal of protected species. Copies of the permits must be kept on site by the Environmental Control Officer.
- A Fauna and Flora Management Plan must be adhered to during all phases of the project.
- Enforce strict adherence to buffer protections and conduct ongoing camera trap monitoring and adaptive management to assess the presence of the Riverine Rabbits and protection within the development footprint.
- Establish and implement an ongoing roadkill monitoring programme (inclusive of wildlife collisions record keeping) to inspect roads for injured and deceased fauna (including sensitive species) due to the movement of vehicles to and from site.
- Conduct ongoing monitoring and adaptive management to ensure that the development does not exacerbate the Karoo Dwarf Tortoise's already declining population trend. This includes corvid (crows and ravens) censuses to be included in the avifauna operational monitoring, and if corvid populations show large increases, then additional measures such as nest removal and

humane euthanising of corvids must be considered and implemented (this will require an ornithologist and possible permits).

- Rehabilitation post construction and decommissioning must be done in accordance with rehabilitation measures included in the EMPr based on recommendations made in the Terrestrial Biodiversity and Species Assessment in Appendix G.2 of the EIA Report).
- Removal of alien and invasive species, monitoring and follow-up procedures must be in accordance with the National Environmental Management: Biodiversity Act (Act 10 of 2004, as amended) (NEMBA).
- No alien and invasive plant species may be used for rehabilitation purposes; only indigenous species of the area / vegetation type may be used.
- Cleared alien vegetation must not be dumped on adjacent natural vegetation during clearing but must be temporarily stored in a demarcated area and disposed of at a legal facility.
- Electric fencing must not have any strands within 20 cm of the ground which still remain as an effective security barrier while allowing smaller mammals and reptiles to pass through unharmed.
- Carry out Environmental Awareness Training throughout the construction period.
- If monitoring results demonstrate that the impacts on Riverine Rabbit and Karoo Dwarf Tortoise are higher than predicted in Section 9 of the Terrestrial Biodiversity and Species Assessment (Appendix G.2 of this EIA Report), and suitably qualified specialists determine that existing mitigation measures are insufficient to reduce residual impacts to low significance (as predicted in the EIA), then it is recommended that the developer support ongoing conservation and monitoring initiatives for these species in the region through financial contributions. While the funding structure should remain flexible, contributions may be directed towards broader conservation initiatives undertaken by NGOs such as EWT for the Riverine Rabbit, and the Chelonian Biodiversity and Conservation programme (University of the Western Cape) and/or the Dwarf Tortoise Conservation (DTC) for the Karoo Dwarf Tortoise, in partnership with provincial conservation agencies and other renewable energy facilities (REFs) operating within the wider region. This funding can support initiatives such as eDNA sampling, camera trapping and / or radio telemetry. The following financial commitments are recommended should monitoring results confirm that impacts are above predicted levels:
    - Riverine Rabbit (*Bunolagus monticularis*): A financial commitment of R150 000 per year for a period of at least three years, commencing at the start of construction for any of the GEED developments (two years during the construction and one year during the operation of the facility).
    - Karoo Dwarf Tortoise (*Chersobius boulengeri*): A financial commitment of R150 000 per year for a period of at least three years, commencing at the start of construction for any of the GEED developments (two years during the construction and one year during the operation of the facility).
- The water for the construction and operation of the WEF should be provided from a viable water source.
- No non-linear hardened infrastructure (including wind turbine foundations, auxiliary buildings, BESS, and the substation complex) may be placed within areas of high aquatic sensitivity. Linear infrastructure (including service roads and power lines) may cross such areas (including the Elandsfontein River), subject to the stipulated mitigation measures and limited to existing road crossings. Medium sensitivity minor watercourses may be traversed by linear infrastructure where unavoidable, with preference for existing crossings and subject to mitigation.

- Use existing disturbed areas (e.g., roads and access tracks) where possible. In terms of new service tracks, these must be kept to a minimum and should ideally not result in any new/permanent watercourse crossings, but if these are required, then a specific walk down should be conducted with the Aquatic Biodiversity specialist, prior to construction, to identify the most suited crossing position. Where these crossings do occur, it needs to be monitored for erosion. Stormwater management of access roads on steeper slopes in particular, needs to be addressed to prevent erosion of the slopes and adjacent watercourses.
- Construction near sensitive aquatic features should be undertaken in the dry season, where possible.
- If necessary, sediment traps should be placed downstream of works to capture sediment.
- Construction sites and laydown areas should be placed at least 35 m 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 Environmental Control Officer for the project.
- Invasive alien plant growth and signs of erosion should be monitored on an ongoing basis to ensure that disturbed areas do not become infested with invasive alien plants.
- The following recommendations are highlighted below for inclusion in the EA from an avifaunal perspective:
    - Vegetation clearance must be limited to what is absolutely necessary and in adherence to rehabilitation measures. Vegetation must be rehabilitated to its former state where possible after construction.
    - The mitigation measures proposed by the Aquatic, and Terrestrial Biodiversity Specialists must be strictly implemented, particularly regarding minimising the footprint of the activities.
    - Construction activity should be restricted to the immediate footprint of the infrastructure as far as possible, and in particular to the proposed road network.
    - Vehicle and pedestrian access to the remainder of the development site should be strictly controlled to prevent unnecessary disturbance of sensitive / priority avifaunal species, and destruction of vegetation.
    - 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 only be considered if existing roads cannot be upgraded and should be kept to an absolute minimum as far as practical.
    - No turbines are to be located in the buffer zones as indicated in the sensitivity map in the Avifauna Impact Assessment (Appendix G.4 of the EIA Report), summarised below:
        - Verreaux's Eagle nest: A 1 km all infrastructure exclusion zone and a 3.7 km turbine (blade-swept) exclusion zone.
        - Martial Eagle nest: A 2.5 km all infrastructure exclusion zone and a 5 km turbine (blade-swept) exclusion zone.
        - All mapped drainage lines: A 50 m turbine (blade-swept) exclusion zone.
        - Elandsfontein River: A 100 m turbine (blade-swept) exclusion zone.
        - Any boreholes and dams: A 200 m turbine (blade-swept) exclusion zone.
        - Jackal Buzzard nest: A 750 m turbine (blade-swept) exclusion zone.
        - Hamerkop nest: A 500 m turbine (blade-swept) exclusion zone.

        - Verreaux's Eagle nest: All turbines in the area >3.7 km up to 5.2 km should be regarded as medium-risk and relocated if possible. Should relocation not be feasible, these turbines should be subject to pro-active mitigation in the form of a proven mitigation method such as Shutdown on Demand, using either bio-monitors or an automated system.
    - All wind turbines must have one or two blades patterned according to a South African Civil Aviation Authority (SACAA) approved pattern and the latest guidance on blade patterning as published by BirdLife South Africa (BLSA) to reduce the risk of avian collisions.
    - The results of the bird pre-construction monitoring must guide the layout of the turbines, especially as far as proposed no-turbine zones are concerned. No turbines must be located in the buffer zones which were identified based on the results of the pre-construction monitoring, with a specific view to limiting the risk of collisions to a variety of birds, including several Red Data species.
    - It is recommended that the minimum tip height of the turbine blades should be at least 25 m, preferably higher, as low flying birds are at greater risk of turbine collisions if the lower tip height is too low. The disturbance factor would be greater too, especially for ground nesting birds.
    - Formal live-bird monitoring and carcass searches should be implemented in the operational phase, as per the most recent edition of the Best Practice Guidelines at the time (Jenkins et al. 2015) to assess collision rates.
    - A Biodiversity Management Plan (BMP) must be compiled for the site prior to commercial operation, and potential biological removal (PBR) values for all priority avifaunal species on-site must be determined. The BMP must define acceptable mortality thresholds for species of conservation concern, using the best information on population estimates, trends, Red Data status and guidelines available at the time. If fatality numbers exceed annual thresholds, additional mitigation measures must be implemented as part of the adaptive management strategy. The choice of additional mitigation measures will be dependent on the measures in place at the time and could involve the implementation of Shutdown on Demand measures or selective curtailment of specific turbines during high-risk periods.
    - Monitor the electrocution mortality in the substations monthly. Apply mitigation (insulation of live components) if electrocution of Species of Conservation Concern (SCC) happens more than once per annum.
    - Use underground cabling for the medium voltage networks as much as is practically possible. In instances where the medium voltage cables cannot be buried due to technical constraints or to accommodate other environmental sensitivities (specifically aquatic ecology), the avifaunal specialist must be consulted to ensure that a bird-friendly pylon design is used, and appropriate mitigation should be implemented pro-actively for pylon structures e.g., insulation of live components to prevent electrocutions on terminal structures and pole transformers. A registered SACNASP Avifaunal Specialist must sign off on the design for the pylons and overhead lines.
    - Anti-perching devices to be installed on all overhead 33 kV pylons to deter birds.
    - Phosphorescent-type Bird Flight Diverters (BFDs) must be fitted in a staggered configuration (on the earth wire and conductor) to all overhead lines for the full length according to the applicable Eskom Engineering Instruction (5 m apart for

medium voltage power lines and 15 m apart for high voltage power lines). These devices must be installed as soon as the conductors are strung.
    - Conduct quarterly inspections of all overhead sections of the medium voltage power lines as well as the 132 kV overhead power line to look for bird carcasses and to ensure that BFDs are still intact and functioning correctly.
    - Any bird fatalities should be recorded as part of the post-construction avifaunal monitoring reports.
- The mitigation measures identified in the Visual Impact Assessment are considered to be good practice and should all be implemented and maintained throughout the construction, operation and decommissioning phases of the proposed WEF. Note that the blade patterning recommendations are supported by both the Visual and Avifaunal Specialists.
- A pre-construction archaeological walkover survey of the final WEF layout must be undertaken by a suitably qualified and experienced archaeologist to determine whether any previously unrecorded archaeological sites are present that may need mitigation or protection through micrositing of infrastructure or services.
- In the event of archaeological resources, including rock art or engravings, being encountered during the course of development, work in the immediate area must be halted and the find reported to the Environmental Control Officer. The Environmental Control Officer must inform Heritage Western Cape (HWC) (or South African Heritage Resources Agency (SAHRA)) if it is within the portion of the development area in the Northern Cape) so that the find can be assessed by an archaeologist and arrangements made to mitigate it, if necessary. If the find is significant, it may require mitigation (for example, sampling or excavation). Mitigation will be the responsibility of the developer.
- The portions of walls JG009 and JG024 which will be demolished to accommodate the increased width and new alignment of the existing farm road required for the construction of the WEF should be photographically recorded by an archaeologist before the demolition takes place.
- Special care should be taken during the upgrading of the access road through the Donkergat werf (i.e. farmstead) and its use for construction-related activities to ensure that the remaining portion of wall JG024 and the historical kraal GEB005 are not damaged or disturbed. The ECO, in collaboration with the relevant construction manager(s), must make this clear to the contractors and must monitor their compliance. It is suggested that the wall and kraal are marked or signposted to make this clear. Should any damage to either of these features occur, Heritage Western Cape must be informed immediately.
- The following no-go buffers must be implemented around other stone features:
    - 30 m buffer around JG019 (large stone-walled enclosure).
    - 30 m buffer around JG001-JG003 (stockpost).
    - 50 m buffer around JG016-JG018 (corbelled huts).
    - 10 m buffer around GEB003 (stone cairn).
    - 10 m buffer around JG010 (stone cairn).
- Should any human remains be encountered at any stage during the construction or earthworks associated with the project, work in the vicinity must cease, the remains must be left *in situ* but made secure and the project archaeologist and Heritage Western Cape (HWC) (or South African Heritage Resources Agency (SAHRA)) if it is within the portion of the development area in the Northern Cape) must be notified immediately so that mitigatory action can be determined and implemented. Mitigation will be the responsibility of the developer.

- The Environmental Control Officer must be informed that the Teekloof Formation of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup) has a Very High Palaeontological Sensitivity.
- Accountable supervisory personnel must be trained by a qualified palaeontologist on how to identify fossil heritage.
- If palaeontological heritage is uncovered during surface clearing or excavations, the Chance Find Protocol included in the Palaeontology Impact Assessment (Appendix G.7 of this EIA Report), must be implemented immediately. Fossil discoveries must be protected *in situ* (if possible), and the ECO or site manager must report the find to the relevant heritage authority, namely the South African Heritage Resources Agency (SAHRA) for discoveries in the Northern Cape or Heritage Western Cape (HWC) for discoveries in the Western Cape, so that appropriate mitigation measures, including the recording and collection of fossils by a qualified specialist, can be carried out. Before any fossil material can be collected from the development site, the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012).
- The mitigation measures identified for the different project phases in the Socio-Economic Impact Assessment (Appendix G.8 of the EIA Report), which are included in the EMPr (Appendix H.1 of the EIA Report), should all be implemented throughout the construction, operation and decommissioning phases of the proposed WEF.
- All remedial work or modifications to the vertical alignment of the public road network must be done during the planning approval process, in consultation with and based on the approval of the local road authority.
- The unsafe section of the gravel road, through the Molteno Pass on the TR05801, is to be upgraded by the developer to improve the safety of the road for all road users, including the personnel commuting to and from the site on a daily basis. This upgrade would need to be implemented prior to or during site establishment but before major earthworks commence on the proposed development, if this has not already been undertaken as part of other renewable energy projects.
- The access into Loxton from the TR01607 is to be upgraded by the project developer to accommodate the expected transportation requirements if this has not already been undertaken as part of other renewable energy projects. This upgrade would need to be implemented to facilitate the delivery of abnormal loads to the proposed development.
- The route for construction vehicles from the TR01607 to the TR05801 should not unduly impact the local community of Loxton and should avoid the commercial centre of Loxton.
- The developer shall contribute to the maintenance of all roads affected by the proposed Eland WEF development, during the construction and operational phases of the development.
- A Traffic Management Plan (TMP) is required to outline specific traffic management measures across all phases of the development.
- The developer shall ensure that the contractor provides the necessary driver training to key personnel to minimise the potential of incidents on the public road network.
- The developer shall ensure that the contractor erects temporary signs warning motorists of construction vehicles on the approaches to the access road.
- The developer shall ensure that the condition of the roads impacted by the construction of the development is left in a similar or better state once the construction phase is complete.

- Ensure that the necessary permits or approvals from the relevant road authority are in place to accommodate the turning movements of the abnormal load vehicles on the surrounding road network.
- Implement the relevant transport impact mitigations measures as detailed in Section 10.2 and Section 12 of the Traffic Impact Assessment (Appendix G.9 of the EIA Report).
- For the BESS, ensure that the technical and system suggestions for managing and reducing risks under preventative and mitigative measures listed in the tables in Section 4 of the BESS High-Level SHE Risk Assessment are included in the design.
- In order to limit on-site risks, any office and maintenance buildings should be located at least 20 m, although preferably 50 m, from the BESS.
- Ideally the BESS should be located over 500 m from occupied farmhouses / developments / public facilities / residences etc.
- Ideally, the BESS should be placed at least 50 m away from known boreholes and water points, and outside of the sensitive areas identified by the Aquatic Biodiversity specialist.
- A Stormwater Management Plan should be developed prior to the construction phase by an accredited professional. The management plan should be managed throughout the duration of the project to successfully mitigate potential soil erosion.
- Rehabilitation of soil and geological material to commence during the construction phase, if possible, alternatively following the construction phase to allow successful re-vegetation.
- Soil and geological material should be reinstated to natural or near natural conditions following decommissioning.
- Machinery and equipment to be maintained throughout the project.
- Ground protection measures to be implemented during maintenance and refuelling operations.
- The BESS must be suitably designed and assembled in line with relevant product specifications, with necessary measures for containment and leak detection.
- Spillages to be removed and contained as rapidly as possible.
- Recheck large mature trees within 50 m of turbines for roosting bats before construction.
- Ensure the project layout does not overlap buffered bat sensitivities. Buffers of potential roosts (buildings, rocky crevices) and key bat habitats (water features, mature trees) are 200 m, and 50 m for all drainage lines.
- From a bat perspective, keep the lower blade sweep above 50 m.
- Minimize laydown areas and access roads; and place infrastructure in already disturbed zones.
- Limit vegetation removal, especially mature trees within 50 m of turbines.
- Conduct bat operational monitoring for 2 years, then every 5 years; and assess bat fatalities quarterly against the South African Bat Assessment Association (SABAA) guidelines.
- Share activity and fatality bat data with a bat specialist to refine mitigation (if such refinement is needed).
- Implement blade feathering from the start of operations.
- Apply curtailment during spring-autumn or install acoustic deterrents if bat mortality exceeds thresholds.
- Use minimal, essential lighting only; avoid insect-attracting types like sodium and mercury lights.
- Fit lights with motion sensors, direct light downward, and reduce light intensity and spread.
- Restrict decommissioning activities to daylight hours.
- During the planning phase, re-model possible noise emissions if the turbine positions change substantially (i.e., more than 50 m).

- Implement a 500 m buffer around all Noise Sensitive Areas to ensure no future wind turbines impact these Noise Sensitive Areas.
- Train staff on noise sensitivity and the use of noise protective gear.
- Comply with the Western Cape Noise Control Regulations published in Provincial Notice 200/2013.
- Limit construction and decommissioning activities / piling to daytime in order to take advantage of unstable weather conditions.
- Service equipment regularly to ensure no unnecessary noise is emitted.
- Monitoring of noise during the construction and decommissioning phases to confirm that noise levels are within limits.
- Conduct noise monitoring to determine the actual noise impact and whether further mitigation measures need to be implemented. This may include operating the turbine in a low noise mode (i.e. reducing power output under certain operational conditions).
- A Water Use Licence or General Authorisation must be obtained from the relevant Water Use Authority for the relevant Section 21 water use activities as provided in the National Water Act (Act 36 of 1998, as amended), prior to the commencement of the construction phase for the development.
- Prior to the commencement of construction, a land use zoning authorisation must be obtained from the relevant municipalities for the consent use of “renewable energy structure” on the land which is zoned as agricultural.
- Prior to the commencement of construction, an Obstacle Application must be submitted to a SACAA approved service provider, and the applicable approval must be obtained, as required by SACAA.

Paul Lochner

NAME OF EAP

EAPASA Registration No. 2019/745

SIGNATURE OF EAP

14 October 2025

DATE