Groothoek Wind Energy Farm (Pty) Ltd

GROOTHOEK WIND ENERGY FACILITY, LOCATED NEAR VERKYKERSKOP IN THE FREE STATE PROVINCE

Final Environmental Scoping Report

DFFE Reference Number: 14/12/16/3/3/2/2666

14/12/16/3/3/2/2666
MARCH 2025

CONFIDENTIAL

Groothoek Wind Energy Farm (Pty) Ltd

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TYPE OF DOCUMENT (VERSION) CONFIDENTIAL

PROJECT NO. 41106427

OUR REF. NO. 14/12/16/3/3/2/2666

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Final Environmental Scoping Report

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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft Scoping Report – Groothoek WEF	Final Scoping Report – Groothoek WEF		
Date	January 2025	March 2025		
Prepared by	Matilda Mabazo	Jashmika Maharaj		
Signature	-	jashmika.maharaj@wsp.com CN=jashmika.maharaj@wsp.com 3/7/25 12:57:30 PM		
Checked by	Jashmika Maharaj	Ashlea Strong		
Signature	-	Digitally signed by Ashlea Strong DN: cn=Ashlea Strong, c=ZA, o=WSP Group Africa, ou=Earth and Environment, email=ashlea.strong@wsp.com Date: 2025.03.07 12:37:24 +02'00'		
Authorised by	Ashlea Strong	Ashlea Strong		
Signature	-	Digitally signed by Ashlea Strong DN: cn=Ashlea Strong, c=ZA, o=WSP Group Africa, ou=Earth and Environment, email=ashlea.strong@wsp.com Date: 2025.03.07 12:37:40 +02'00'		
Project number	41106247	41106247		
Report number	01	01		
File reference	\\corp.pbwan.net\za\Central_Data\Projects\41100xxx\41106427 - Verkykerskop WEF Cluster EA\41 PA\01-Reports\04-Scoping Report\Groothoek WEF\			

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PROJECT INFORMATION

Applicant
Groothoek Wind Energy Farm (Pty) Ltd
Project Name
Groothoek Wind Energy Facility located near Verkykerskop in the Free State Province
DFFE Reference Number
14/12/16/3/3/2/2666
WSP Project Number
41106247
Report Type
Final Environmental Scoping Report

GENERAL SITE INFORMATION

Technical details of the proposed Groothoek Wind Energy Facility (WEF) located near Verkykerskop in the Free State Province		
Location of Site	North east of Harrismith in the Phumelela Local Municipality and Thabo Mofutsanyane District Municipality, near Verkykerskop, in the Free State Province of South Africa	
Description of all affected farm portions and 21-digit SG Codes	**Farm Name**	**21-Digit SG Code**
	Portion 0 of Farm Schoonzicht No.80	F01500000000008000000
	Portion 0 of Farm Groothoek No. 89	F01500000000008900000
	Portion 0 of Farm Kromdraai No. 273	F01500000000027300000
	Portion 0 of Farm Kransbank No.288	F01500000000028800000
	Portion 0 of Farm Kranspunt No.459	F01500000000045900000
	Portion 0 of Farm Van Kope No.1319	F01500000000131900000
Central coordinates of the site and activity location	27°59'47.95"S 29°27'34.84"E	
Total Area of Applicable Farm Portions	6 170 ha	
Design Specifications		
Total Buildable Area (I.e. likely footprint area)	• Approximately 150ha. • (Subject to finalization based on technical and environmental requirements)	
Export Capacity	• Up to 300MW • (Subject to finalization based on technical and environmental requirements)	
Technology	• Wind	
Number of Wind Turbines	• Up to 55	
Rotor Diameter	• Up to 200m	
Hub Height	• Up to 140m	

Technical details of the proposed Groothoek Wind Energy Facility (WEF) located near Verkykerskop in the Free State Province	
Hard Standing Footprint	• Up to 0,8ha per turbine
Turbine Foundations	• Excavation up to 4.5mdeep, constructed of reinforced concrete to support the mounting ring. • Once tower established, footprint of foundation is covered with soil.
Substation	• 1 x 33kV/132kV onsite collector substation (IPP Portion), each being up to 2ha.
Powerlines	• 33kV cabling to connect the wind turbines to the onsite collector substation, to be laid underground where practical and ecologically acceptable.
Construction camp and laydown area	• Construction compounds including site office inclusive of • Concrete Batching plant of up to 1ha • Site office of 4ha • Laydown area of 8ha
Internal Roads	• Up to 8m in width (operational road surface width excluding V drains and cabling). During construction the disturbed road footprint will be up to 14m wide including v-drains and trenching for cabling)
O&M Building	• O&M office of up to 1ha.
BESS	• Battery Energy Storage System (BESS) (200MW/800MWh). • Pre-assembled solid state batteries • Export Capacity of up to 800MWh • Total storage capacity 200MW • Storage capacity of up to 6-8 hours The BESS will be housed in containers covering a total approximate footprint of up to 7ha

1 INTRODUCTION

All changes and additions made in this report from the draft have been underlined.

WSP Group Africa (Pty) Ltd (WSP) has been appointed by Groothoek Wind Energy Farm (Pty) Ltd (Groothoek WEF) to undertake an Environmental Impact Assessment (EIA) to meet the requirements under the National Environmental Management Act (Act 107 of 1998) (NEMA), for the proposed Groothoek Wind Energy Facility (WEF), located near the town of Harrismith in the Free State Province.

The proposed development is subject to a Scoping and Environmental Impact Reporting (S&EIR) Process in terms of NEMA (as amended) and Appendix 2 and 3 of the EIA Regulations, 2014 and GNR 983 (as amended), GNR 984 (as amended) and GNR 985 (as amended). The competent authority for this S&EIR Process is the national Department of Forestry, Fisheries and Environment (DFFE).

The Groothoek WEF will include the following main components:

- Wind Turbines;
- Onsite substations;
- 33kV cabling powerlines;
- Construction camp and laydown area;
- Operations & Maintenance (O&M) Building;
- Battery Energy Storage System (BESS); and
- Internal Roads.

1.1 PURPOSE OF THIS REPORT

The S&EIR process is an interdisciplinary procedure to ensure that environmental and social considerations are included in decisions regarding projects. Simply defined, the process aims to identify the possible environmental and social effects of a proposed activity and how those impacts can be mitigated.

The Final Scoping Report (FSR) (this report) aims to provide stakeholders with information on the proposed development including location, layout and technological alternatives, the scope of the environmental assessment and key impacts to be addressed in the environmental assessment, and the consultation process undertaken through the EIA process.

1.2 BACKGROUND INFORMATION

Mulilo Renewable Project Developments (Pty) Ltd (Mulilo) are proposing the development of the Verkykerskop WEF Cluster in the Free State Province.

The Verkykerskop WEF Cluster is divided into 3 projects which require full S&EIR Processes:

- **Groothoek WEF (up to 300MW) (Applicable to this Report and Application);**
- Kromhof WEF (up to 300MW); and
- Normandien WEF (up to 300MW).

The following related projects will require separate Basic Assessment (BA) Processes:

- Groothoek up to 132kV Grid Connection;
- Kromhof up to 132kV Grid Connection; and
- Normandien up to 132kV Grid Connection.

The focus of this Application is the proposed Groothoek WEF (up to 300MW).

The proposed project is located in the Thabo Mofutsanyane District Municipality and Phumelela Local Municipality (Ward 5), north east of the town of Harrismith, in the Free State Province of South Africa (**Figure 1-1** and **Figure 1-2**).

The Groothoek WEF will be developed to allow for up to 300 MW for export from the facility. The proposed development footprint (buildable area) is approximately 150 hectares (ha) (subject to finalisation based on technical and environmental requirements), and the extent of the project area is approximately 6 170 ha. The development footprint includes the wind turbines and all associated infrastructures as indicated in the table below.

Table 1-1 – Key Technical Details for the proposed Groothoek WEF

Aspect	Details
Total Buildable Area (I.e. likely footprint area)	• Approximately 150ha. • (Subject to finalization based on technical and environmental requirements)
Export Capacity	• Up to 300MW • (Subject to finalization based on technical and environmental requirements)
Technology	• Wind
Number of Wind Turbines	• Up to 55
Rotor Diameter	• Up to 200m
Hub Height	• Up to 140m
Hard Standing Footprint	• Up to 0,8 ha per turbine
Turbine Foundations	• Excavation up to 4 m deep, constructed of reinforced concrete to support the mounting ring. • Once tower established, footprint of foundation is covered with soil.
Substation	• 1 x 33kV/132kV onsite collector substation (IPP Portion), being up to 2ha.
Powerlines	• 33kV cabling to connect the wind turbines to the onsite collector substation, to be laid underground where practical and ecologically acceptable.
Construction camp and laydown area	• Construction compounds including site office inclusive of • Concrete Batching plant of up to 1ha

Aspect	Details
	• Site office of 4 ha • Laydown area of 8ha
Internal Roads	• Up to 8m in width (operational road surface width excluding V drains and cabling). During construction the disturbed road footprint will be up to 14m wide including v-drains and trenching for cabling)
O&M Building	• O&M office of up to 1ha.
BESS	• Battery Energy Storage System (BESS) (200MW/800MWh). • Pre-assembled solid state batteries • Export Capacity of up to 800MWh • Total storage capacity 200MW • Storage capacity of up to 6-8 hours The BESS will be housed in containers covering a total approximate footprint of up to 7ha

1.3 PROJECT LOCATION

The Groothoek WEF is located near the town of Harrismith in Ward 5 of the Phumelela Local Municipality (PLM) and in the Thabo Mofutsanyana District Municipality (TMDM) in the Free State Province (**Figure 1-1** and **Figure 1-2**).

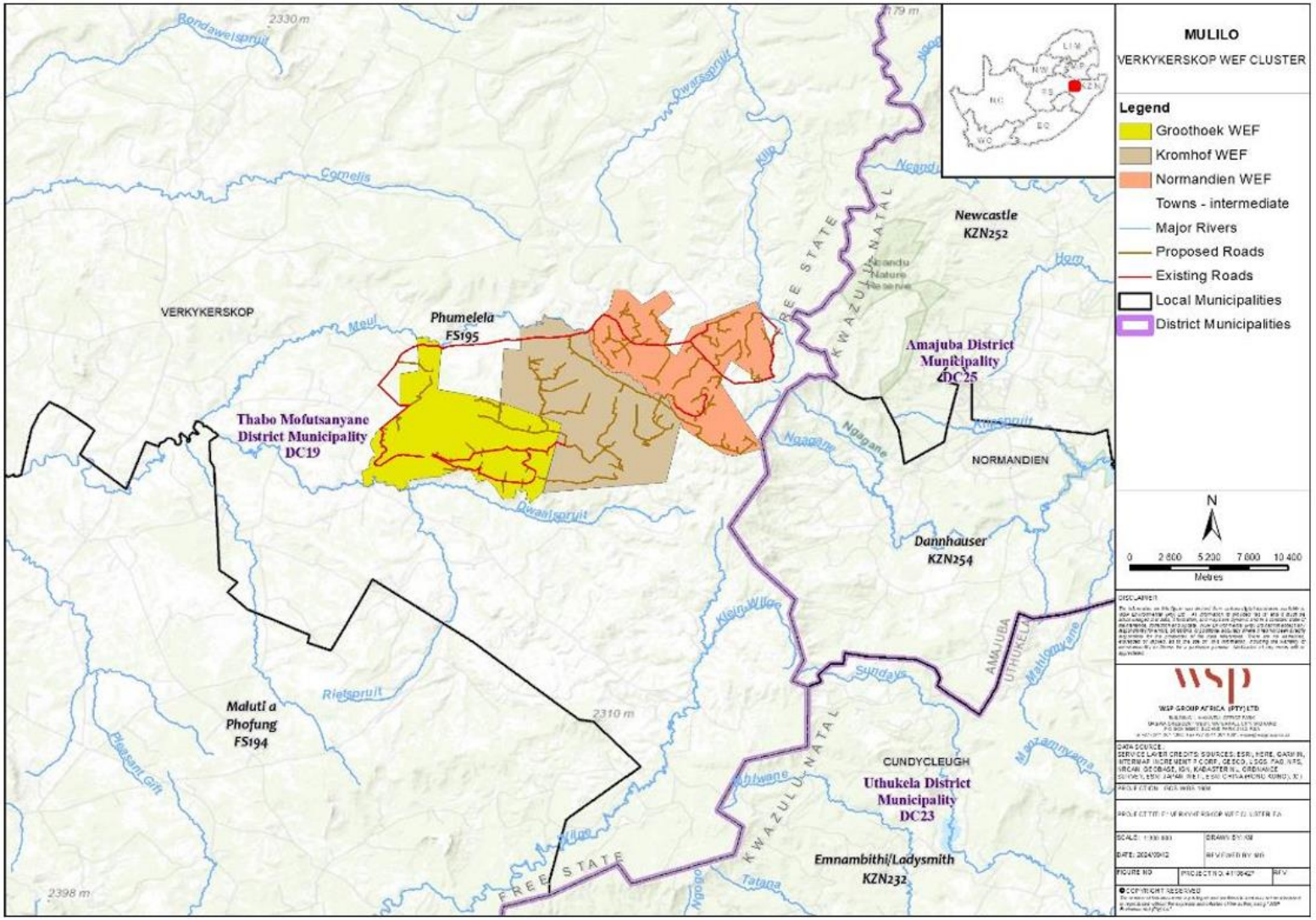

Figure 1-1 – Regional locality map for the Verkykerskop WEF Cluster and the Groothoek WEF (yellow polygon)

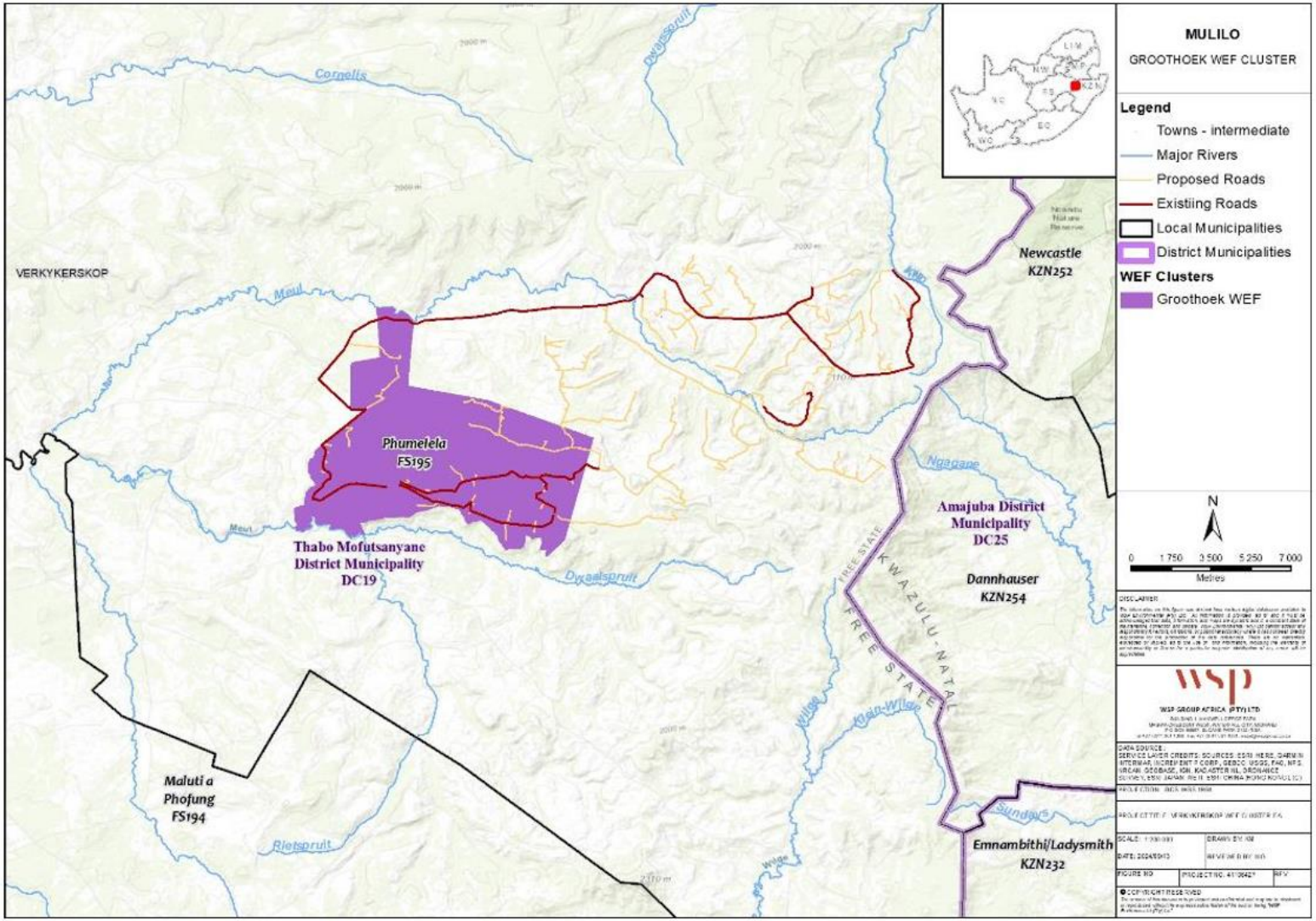

Figure 1-2 - Groothoek WEF Regional locality map

1.4 DETAILS OF KEY ROLE PLAYERS

1.4.1 PROJECT PROPONENT

Groothoek Wind Energy Farm (Pty) Ltd is the project proponent (Applicant) with regards to this application for the construction and operation of the Groothoek WEF. **Table 1-2** provides the relevant details of the project proponent.

Table 1-2 – Details of Project Proponent

Proponent:	Groothoek Wind Energy Farm (Pty) Ltd
Contact Person:	Greg Midlane
Postal Address	21st Floor, Portside, 5 Buitengracht Street, Cape Town, 8001
Telephone:	27 21 685 3240
Email:	grmi@mulilo.com

1.4.2 COMPETENT AUTHORITY

Section 24C(2)(a) of NEMA stipulates that the Minister of Forestry, Fisheries and the Environment ("the Minister") must be identified as the competent authority (CA) if the activity has implications for international environmental commitments or relations. GN 779 of 01 July 2016 identifies the Minister as the CA for the consideration and processing of environmental authorisations and amendments thereto for activities related to the Integrated Resource Plan (IRP) 2010 – 2030.

As the proposed Groothoek WEF is related to the IRP, DFFE is the CA for the proposed project.

Table 1-3 provides the relevant details of the competent authority on the Project.

Table 1-3 – Competent Authority

Aspect	Competent Authority	Contact Details
Competent Authority: Environmental Authorisation	Department of Forestry, Fisheries, and the Environment (DFFE)	Case Officer: Mr Lunga Dlovu Integrated Environmental Authorisations Email: LDlova@dffe.gov.za DFFE Ref: Still to be issued

1.4.3 COMMENTING AUTHORITY

The commenting authorities for the project include:

- Department of Forestry, Fisheries, and the Environment (DFFE);
- Free State Department of Economic, Small Business Development, Tourism & Environmental Affairs (DESTEA);
- DFFE: National Vulture Task Force (in terms of section 43(2) and 43(3)(c) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), the Minister has

assigned the responsibility for implementation of the Multi-species Biodiversity Management Plan for Vultures in South Africa to the National Vulture Task Force).
- Department of Water and Sanitation (DWS);
- Department of Mineral Resources and Energy (DMRE);
- Petroleum Agency of South Africa (PASA);
- Department of Agriculture, Land Reform and Rural Development (DALRRD);
- Department of Public Works;
- Department of Defence;
- National Department of Transport;
- South African National Roads Agency Limited (SANRAL);
- South African Heritage Resources Agency (SAHRA);
- South African Civil Aviation Authority (CAA);
- Square Kilometre Array (SKA);
- South African Radio Astronomical Observatory (SARAO);
- South African Weather Service (SAWS);
- Relevant Local Government Authorities in respect of zoning, water services related activities;
- BirdLife South Africa;
- VulPro;
- Endangered Wildlife Trust; and
- South African National Parks.

Refer to the Stakeholder Engagement Report (SER) in **Appendix C** for a full list of commenting authorities.

1.4.4 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

WSP was appointed in the role of Independent EAP to undertake the S&EIR process for the proposed project. The CV of the EAP is available in **Appendix A.1**. The EAP declaration of interest and undertaking is included in **Appendix A.2**. **Table 1-4** details the relevant contact details of the EAP.

Table 1-4 – Details of the EAP

EAP:	**WSP Group Africa (Pty) Ltd**
Contact Person:	Ashlea Strong
Physical Address:	Building 1, Maxwell Office Park, Magwa Crescent West, Waterfall City, Midrand, 1685
Postal Address:	PO Box 6001, Halfway House, 1685
Telephone:	011 361 1392
Fax:	011 361 1301
Email:	Ashlea.Strong@wsp.com
EAP Qualifications:	• Masters in Environmental Management, University of the Free State • B Tech, Nature Conservation, Technikon SA

	• National Diploma in Nature Conservation, Technikon SA
EAPASA Registration Number:	EAPASA (2019/1005)

Statement of Independence

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal or other interest that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the assessment

1.4.5 SPECIALISTS

Specialist input was required in support of this application for Environmental Authorisation (EA). The details of the specialists are provided in **Table 1-5** below. The specialist studies are attached in **Appendix G** and their declarations in **Appendix B.2**.

Table 1-5 – Details of Specialists

Assessment	Name of Specialists	Company	Sections in Report	Specialist Report attached as
Agriculture	• Johann Lanz	Johann Lanz (Independent Consultant)	• Section 2.7 • Section 6.1.1 • Section 8 • Section 9 • Section 11.5	**Appendix G.4**
Avifauna	• Tyron Clark, Ryno Kemp & Andrew Husted	The Biodiversity Company	• Section 2.7 • Section 6.2.5 • Section 8 • Section 9 • Section 11.5	**Appendix G.7**
Bats	• Dr. Caroline Lotter	Inkululeko Wildlife Services	• Section 2.7 • Section 6.2.6 • Section 8 • Section 9 • Section 11.5	**Appendix G.8**
Terrestrial Ecology (including Animal and Plant Species Themes)	• Rudolph Greffrath	WSP Africa (Pty) Ltd	• Section 2.7 • Section 6.2.1 • Section 6.2.3 • Section 6.2.4 • Section 8 • Section 9 • Section 11.5	**Appendix G.6**
Aquatic	• Tebogo Khoza	WSP Africa (Pty) Ltd	• Section 2.7 • Section 6.2.2 • Section 8 • Section 9 • Section 11.5	**Appendix G.5**

Assessment	Name of Specialists	Company	Sections in Report	Specialist Report attached as
Heritage	• Lara Kraljević	Beyond Heritage (Pty) Ltd	• Section 2.7 • Section 6.3.1 • Section 8 • Section 9 • Section 11.5	**Appendix G.10**
Socio-economic	• Stephen Horak	WSP Africa (Pty) Ltd	• Section 2.7 • Section 6.3.4 • Section 8 • Section 9 • Section 11.5	**Appendix G.11**
Traffic	• Iris Wink	iWink Consulting (Pty) Ltd	• Section 2.7 • Section 6.3.2 • Section 8 • Section 9 • Section 11.5	**Appendix G.9**
Visual	• Johan Bothma	WSP Africa (Pty) Ltd	• Section 2.7 • Section 6.3.3 • Section 8 • Section 9 • Section 11.5	**Appendix G.2**
Noise	• Kirsten Collett	WSP Africa (Pty) Ltd	• Section 2.7 • Section 6.3.5 • Section 8 • Section 9 • Section 11.5	**Appendix G.3**
Geotechnical Desk Study	• Heather Davis	WSP Africa (Pty) Ltd	• Section 2.7 • Section 6.1.2 • Section 8 • Section 11.5	**Appendix G.1**

1.5 SCOPING TERMS OF REFERENCE

The 2014 EIA Regulations (Government Notice Regulation (GNR) 982), as amended, identifies the proposed Groothoek WEF development as an activity being subject to an S&EIR process due to the applicability of the EIA Listing Notice 2 (GNR 984, as amended).

As defined in Appendix 2 of GNR 982, as amended, the objective of the scoping process is to, through a consultative process:

- Identify the relevant policies and legislation relevant to the activity;
- Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;

- Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- Identify the key issues to be addressed in the assessment phase;
- Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration, and probability of the impacts to inform the location of the development footprint within the preferred site; and
- Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

Public participation is a requirement of scoping; it consists of a series of inclusive interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIR decision-making process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the Proposed Project. The objectives of the public participation process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the Proposed Project;
- Clearly outline the scope of the proposed Project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed Project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the Proposed Project, issues and solutions.

1.6 SCOPING REPORT STRUCTURE

As per the EIA Regulations 2014, as amended, Appendix 2 of GNR 982 identifies the legislated requirements that must be contained within a Scoping Report for the CA to consider and come to a decision on the application. **Table 1-6** below details where the required information is located within this report.

Table 1-6 - Legislated Report Requirements as detailed in GNR 982

Appendix 2 of GNR 982	Description	Relevant Report Section
(a)	Details of	
	the EAP who compiled the report; and	Section 1.4.4 and **Appendix A**

Appendix 2 of GNR 982	Description	Relevant Report Section
	the expertise of the EAP, including a Curriculum Vitae	**Appendix A**
(b)	The location of the activity, including-	
	The 21-digit Surveyor code for each cadastral land parcel;	Section 3.1
	Where available, the physical address and farm name	Section 3.1
	Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property.	N/A
(c)	A plan which locates the proposed activities applied for at an appropriate scale, or, if it is-	
	A linear activity, a description of the corridor in which the proposed activity or activities is to be undertaken; or	N/A
	On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	N/A
(d)	A description of the proposed activity, including	
	All listed and specified activities triggered;	Section 5.1
	A description of the activities to be undertaken, including associated structures and infrastructure;	Section 3.4
(e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 5
(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 3.5
(h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including-	
	Details of all the alternatives considered;	Section 4
	Details of the public participation undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 2.6
	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;	**Appendix C**
	the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 6

Appendix 2 of GNR 982	Description	Relevant Report Section
	the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Section 8; Section 8.2
	the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 2.5
	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;	Section 8; Sifcection 8.2
	the possible mitigation measures that could be applied and level of residual risk;	Section 8; Section 8.2
	the outcome of the site selection matrix;	Section 4
	if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	N/A
	a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 4
(i)	A plan of study for undertaking the environmental impact assessment process to be undertaken, including-	
	a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	Section 4
	a description of the aspects to be assessed as part of the environmental impact assessment process;	Section 9.4
	aspects to be assessed by specialists;	Section 9.5
	a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	Section 9.6
	a description of the proposed method of assessing duration and significance;	Section 9.6
	an indication of the stages at which the competent authority will be consulted;	Section 9.8

Appendix 2 of GNR 982	Description	Relevant Report Section
	particulars of the public participation process that be conducted during the environmental impact assessment process; and	Section 2.6
	a description of the tasks that will be undertaken as part of the environmental impact assessment process;	Section 8.2.1
	identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Section 8.1 Section 9.7
(j)	An undertaking under oath or affirmation by the EAP in relation to-	
	the correctness of the information provided in the report;	**Appendix B**
	the inclusion of comments and inputs from stakeholders and interested and affected parties; and	
	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;	
(k)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	**Appendix B**
(l)	Where applicable, any specific information required by the competent authority; and	N/A
(m)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	N/A

2 S&EIR PROCESS

2.1 OBJECTIVES OF THE S&EIR PROCESS AS PER THE PROCEDURAL FRAMEWORK

The S&EIR process consists of various phases with associated timelines as defined in GNR 982. The process can generally be divided into four main phases, namely, (i) a Pre-application Phase, (ii) an Application and Scoping Phase (current phase), (iii) an Impact Assessment Phase and (iv) Authorisation and Appeal Phase.

The main objectives of the phases can be described as follows:

- Pre-Application Phase (**Complete**):
  - Undertake consultation meetings with the relevant authorities to confirm the required process, the general approach to be undertaken and to agree on the public participation plan;
  - Identify stakeholders, including neighbouring landowners/residents and relevant authorities;
- Application and Scoping Phase (**Current**):
  - Compile and submit application forms to the CA and pay the relevant application fees;
  - Compile a DSR describing the affected environment and present an analysis of the potential environmental issues and benefits arising from the proposed project that may require further investigation in the Impact Assessment Phase;
  - Develop draft terms of reference for the specialist studies to be undertaken in the Impact Assessment Phase; and
  - Inform stakeholders of the proposed project, feasible alternatives and the S&EIR process and afford them the opportunity to register and participate in the process and identify any issues and concerns associated with the proposed project.
  - Incorporate comments received from stakeholders during the DSR comment period;
  - Should significant amendments be required, release the updated DSR for a 30-day comment period to provide stakeholders with the opportunity to review the amendments as well as provide additional input if required; and
  - Submit the Final Scoping Report (FSR), following the consultation period, to the relevant authorities, in this case the DFFE, for acceptance/rejection.
- Impact Assessment Phase (**Not yet applicable**):
  - Continue to inform and obtain contributions from stakeholders, including relevant authorities, stakeholders, and the public and address their relevant issues and concerns;
  - Assess in detail the potential environmental and socio-economic impacts of the project as defined in the DSR;
  - Identify environmental and social mitigation measures to avoid and/or address the identified impacts;
  - Develop and/or amend environmental and social management plans based on the mitigation measures developed in the Environmental Impact Assessment Report (EIAR);
  - Submit the EIAR and the associated the Environmental Management Programme (EMPr) to the CA to undertake the decision making process;
  - Authorisation and Appeal Phase;

- The DFFE to provide written notification of the decision to either grant or refuse EA for the proposed project; and
- Notify all registered stakeholders of the decision and right to appeal.

2.2 DFFE WEB-BASED ENVIRONMENTAL SCREENING TOOL

DFFE has developed the National Web-based Environmental Screening Tool in order to flag areas of potential environmental sensitivity related to a site as well as a development footprint and produces the screening report required in terms of regulation 16 (1)(v) of the EIA Regulations (2014, as amended). The Notice of the requirement to submit a report generated by the national web-based environmental screening tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended (GN 960 of July 2019) states that the submission of a report generated from the national web-based environmental screening tool, as contemplated in Regulation 16(1)(b)(v) of the EIA Regulations, 2014, published under Government Notice No. R982 in Government Gazette No. 38282 of 4 December 2014, as amended, is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the EIA Regulations, 2014 (as amended) as of 04 October 2019.

The Screening Report generated by the National Web-based Environmental Screening Tool contains a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development footprint as well as the most environmentally sensitive features on the footprint based on the footprint sensitivity screening results for the application classification that was selected.

A screening report for the proposed Groothoek WEF was generated on 30 September 2024 and is attached as **Appendix E**. The Screening Report for the project identified various sensitivities for the site. The report also generated a list of specialist assessments that should form part of the S&EIR based on the development type and the environmental sensitivity of the site. Assessment Protocols in the report provide minimum information to be included in a specialist report to facilitate decision-making.

Table 2-1 below provides a summary of the sensitivities identified for the development footprint.

Table 2-1 - Sensitivities identified in the DFFE Screening Report

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme		X		
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Avian (Wind) Theme				X
Bats (Wind) Theme		X		

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Civil Aviation (Wind) Theme				X
Defence (Wind) Theme				X
Flicker Theme				X
Landscape (Wind) Theme	X			
Palaeontology Theme	X			
Noise Theme				X
Plant Species Theme			X	
RFI (Wind) Theme				X
Terrestrial Biodiversity Theme	X			
Vulture Species Theme		X		

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report as determined by the screening tool:

- Agricultural Impact Assessment;
- Landscape/Visual Impact Assessment;
- Archaeological and Cultural Heritage Impact Assessment ;
- Palaeontology Impact Assessment;
- Terrestrial Biodiversity Impact Assessment;
- Aquatic Biodiversity Impact Assessment;
- Geotechnical Assessment;
- Avian Impact Assessment;
- Civil Aviation Assessment;
- Defence Assessment;
- RFI Assessment;
- Noise Impact Assessment;
- Flicker Assessment;
- Traffic Assessment;
- Geotechnical Assessment;
- Socio-Economic Assessment;
- Plant Species Assessment; and
- Animal Species Assessment.

2.2.1 MOTIVATION FOR SPECIALIST STUDIES

The report recognises that “it is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the footprint situation.

Table 2-2 outlines the specialist assessments that have been commissioned for the project based on the environmental sensitivities identified by the Screening Report.

Table 2-2 - Specialist Studies identified by the DFFE Screening Tool

Specialist Study Identified	Specialist Study Commissioned	Specialist and Report Reference	Motivation
Agricultural Impact Assessment	Yes	Johann Lanz	N/A
Landscape/Visual Impact Assessment	Yes	WSP Group Africa (Pty) Ltd	N/A
Archaeological and Cultural Heritage Impact Assessment	Yes	Beyond Heritage	N/A
Palaeontology Impact Assessment	Yes	Beyond Heritage	N/A
Terrestrial Biodiversity Impact Assessment	Yes	WSP Group Africa (Pty) Ltd	N/A
Aquatic Biodiversity Impact Assessment	Yes	WSP Group Africa (Pty) Ltd	N/A
Bats Impact Assessment	Yes	Inkululeko Wildlife Services	N/A
Avian Impact Assessment	Yes	Andrew Husted	N/A
Civil Aviation Assessment	No	N/A	According to the DFFE Screening Tool Report, civil aviation is regarded as having low sensitivity. No major or other types of civil aviation aerodromes will be impacted by the proposed development. Therefore, a compliance statement is not required as per the protocol specifications. Nevertheless, the relevant Authorities have been included on the project stakeholder database. As of the 1st of May 2021, Air Traffic

Specialist Study Identified	Specialist Study Commissioned	Specialist and Report Reference	Motivation
			and Navigation Services (ATNS) has been appointed as the new Obstacle application Service Provider for Windfarms and later Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Windfarms and in due time Power Plant assessments. An Application for the Approval of Obstacles has been submitted to ATNS. The South African Civil Aviation Authority (SACAA) has been included on the project stakeholder database. They have been informed of the proposed Project, and comments have been sought from these authorities as applicable (Refer to **Appendix C** of the Final Scoping Report for the proof). An application for the Approval of Obstacles has been submitted to ATNS/CAA and the required permits will be obtained prior to the development of the project.
Defence Assessment	No	N/A	According to the DFFE Screening Tool Report, Defence is regarded as having low sensitivity. Therefore, a compliance statement is not required as per the protocol specifications. The Department of Defence have been included on the project stakeholder database. They have been informed of the proposed Project, and comments have been sought from these authorities as applicable (Refer to **Appendix C** of the Final Scoping Report for the proof).
RFI Assessment	No	N/A	Due to the low sensitivity identified by the Screening tool, a compliance statement is not required. A RFI Study will not be undertaken. However, SKA/SARAO, SAWS and relevant telecommunications stakeholders will be engaged with as part of the Public Participation Process.

Specialist Study Identified	Specialist Study Commissioned	Specialist and Report Reference	Motivation
Noise Impact Assessment	Yes	WSP Group Africa (Pty) Ltd	N/A
Traffic Impact Assessment	Yes	iWink Consulting (Pty) Ltd	N/A
Geotechnical Assessment	Yes	WSP Group Africa (Pty) Ltd	N/A
Socio-Economic Assessment	Yes	WSP Group Africa (Pty) Ltd	N/A
Plant Species Assessment	Yes	WSP Group Africa (Pty) Ltd	N/A
Animal Species Assessment	Yes	WSP Group Africa (Pty) Ltd	N/A

Specialist assessments will be conducted in accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes, which were promulgated in Government Notice No. 320 of 20 March 2020 and in Government Notice No. 1150 of 30 October 2020 (i.e. “the Protocols”). The assessment protocols followed as well as the site sensitivity verification undertaken by the specialists are indicated in **Section 7** and **Appendix F**.

In addition to the Specialist Studies identified by the DFFE Screening Tool and listed in the Screening Report, any potential encumberments on existing mineral and or petroleum right areas will be determined in accordance with the provisions of section 53 of the MPRDA.

Where relevant, specific reference will be given to other environmental management guidelines and tools, such as for example, specific consideration of the Multi-species Biodiversity Management Plan for Vultures in South Africa, implemented under the provisions of section 43(1)(b) and (c) and 43(3)(a) and (b) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

In this instance, the scope of the applicable avifauna specialist studies will, amongst other aspects, be aimed at determining the impact on resident breeding species of vultures and other raptors in the relevant geographic range of the proposed Project.

During the public participation phase, the outcomes of the identified impacts, specific to the geographical region, will in collaboration with the relevant avifauna specialists, conservation stakeholders, regulators and landowners, be circularised and thoroughly canvassed.

The objective is to ensure that an inclusive and transparent consultation process between relevant, informed, suitably qualified and experienced stakeholders, culminate in a comprehensive strategic and bespoke Vulture and Raptor Action Management Plan, informed by the Multi-species Biodiversity Management Plan for Vultures in South Africa, will be implemented for the duration of

the project. The prioritisation of a Vulture and Raptor Action Management Plan is geared at not only adequately mitigate identified impacts, but to work together to strengthen concerted, collaborative, and coordinated efforts to conserve the vulture and other vulnerable bird populations to acceptable and sustainable levels.

Other high priority or sensitive specialist studies will follow the same principal objectives.

2.3 APPLICATION FOR ENVIRONMENTAL AUTHORISATION

The application phase consisted of a pre-application consultation with DFFE and subsequently completing the appropriate application form as well as the submission and registration of the application for EA with the DFFE. The pre-application meeting was held with DFFE on 06 February 2024 (meeting minutes included in **Appendix H**). The application form was submitted to the DFFE with the DSR on the 22 January 2025. The DFFE confirmed receipt of the application on 27 January 2025 and allocated the following reference number to the application - 14/12/16/3/3/2/2666.

2.4 BASELINE ENVIRONMENTAL ASSESSMENT

The description of the environmental attributes of the Project area was compiled through a combination of desktop reviews and site investigations. Desktop reviews made use of available information including existing reports, aerial imagery, and mapping. The specialist teams undertook site investigations, between March and April 2024, to identify sensitive features on site that informed the sensitivity mapping (see Section 7.1.10) for the proposed project.

2.5 IMPACT SCREENING METHODOLOGY

The potential impacts associated with the proposed development were determined at both a desktop level based on existing information, as well as field assessments. The following methodology was used:

- Identify potential sensitive environments and receptors that may be impacted on by the proposed development;
- Identify potential social receptors that may be impacted on by the proposed development;
- Identify the type of impacts that are most likely to occur (including cumulative impacts);
- Determine the nature and extent of the potential impacts during the various developmental phases, including, construction, operation and decommissioning;
- Identify potential No-Go areas; and
- Summarise the potential impacts that will be considered further in the Scoping & EIA phase through detailed specialist studies.

Appendix 2 of GNR 982, as amended, requires the identification of the significance of potential impacts during scoping. To this end, an impact screening tool has been used in the scoping phase. The screening tool is based on two criteria, namely probability; and consequence (**Appendix E**), where the latter is based on general consideration to the intensity, extent, and duration.

The scales and descriptors used for scoring probability and consequence are detailed in **Table 2-4** and **Table 2-5** respectively.

Table 2-3 - Significance Screening Tool

	Consequence Scale				
Probability Scale		1	2	3	4
	1	Very Low	Very Low	Low	Medium
	2	Very Low	Low	Medium	Medium
	3	Low	Medium	Medium	High
	4	Medium	Medium	High	Very High

Table 2-4 - Probability scores and descriptors

Score	Descriptor
4	Definite: The impact will occur regardless of any prevention measures
3	Highly Probable: It is most likely that the impact will occur
2	Probable: There is a good possibility that the impact will occur
1	Improbable: The possibility of the impact occurring is very low

Table 2-5 - Consequence Score Descriptions

Score	Negative	Positive
4	Very severe: An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated.	Very beneficial: A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit.
3	Severe: A long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.	Beneficial: A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these.
2	Moderately severe: A medium to long term impacts on the affected system(s) or party (ies) that could be mitigated.	Moderately beneficial: A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way.
1	Negligible: A short to medium term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary.	Negligible: A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.

The nature of the impact must be characterised as to whether the impact is deemed to be positive (+ve) (i.e. beneficial) or negative (-ve) (i.e. harmful) to the receiving environment/receptor. For ease of reference, a colour reference system (**Table 2-6**) has been applied according to the nature and significance of the identified impacts.

Table 2-6 - Impact Significance Colour Reference System to Indicate the Nature of the Impact

Negative Impacts (-ve)	Positive Impacts (+ve)
Negligible	Negligible
Very Low	Very Low
Low	Low
Medium	Medium
High	High
Very High	Very High

2.6 STAKEHOLDER ENGAGEMENT PROCESS

Stakeholder engagement (public participation) is a requirement of the S&EIR process. It consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIR decision-making process. Effective engagement requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the proposed project. The objectives of the stakeholder engagement process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the proposed project;
- Clearly outline the scope of the proposed project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the proposed project, issues, and solutions.

An SER has been included in **Appendix C** detailing the project's compliance with Chapter 6 of the NEMA EIA Regulations 2014, as amended.

2.6.1 STAKEHOLDER IDENTIFICATION

Stakeholders were identified and will continue to be identified through several mechanisms. These include:

- Utilising existing databases from other projects in the area;

- Advertising in the press;
- Placement of community notices;
- Completed comment sheets;
- Attendance registers at meetings; and
- Discussions by the EAP with the applicant who is familiar with the area.

All Stakeholders identified to date have been registered on the project stakeholder database. The EAP endeavoured to ensure that individuals/organisations from referrals and networking were notified of the Proposed Project. Stakeholders were identified at the horizontal (geographical) and vertical extent (organisations level).

A list of stakeholders captured in the project database is included in the SER in **Appendix C**.

2.6.2 STAKEHOLDER NOTIFICATION

2.6.2.1 Direct Notification

Notification of the proposed Project was issued to potential and existing Stakeholders, via direct correspondence (i.e., site notices, emails, SMSs, etc.) on **22 January 2025**. Proof of notification is included in Appendix B of the SER (**Appendix C**).The notification letter that was circulated is included in Appendix B-3 of the SER (**Appendix C**).

2.6.2.2 Newspaper Advertisements

In accordance with the requirements of GNR 982, as amended, the proposed project has been advertised in two local newspapers. The purpose of the advertisement was to notify the public about the proposed project and to invite them to register as stakeholders. A copy of the advertisements is included in Appendix B-2 of the SER (**Appendix C**). The relevant scoping phase advertisement dates are listed in Table 2 6.

Table 2-7 - Dates on which the Adverts were published

Newspaper	Publication Date	Language
Northern Natal News	03 October 2024	English and Afrikaans
Northern Natal News	03 October 2024	English

2.6.2.3 Site Notices

The official site notices were erected as per GNR 982, as amended, on the boundary fence of the proposed site. In addition, general project notices, announcing the Proposed Project and inviting stakeholders to register, were placed at various locations in and around the project area. A copy of the site notice is included in Appendix B-3 of the SER (**Appendix C**).

2.6.3 PUBLIC REVIEW

The DSR was placed for public review for a period of 30 days from 22 January 2025 to 21 February 2025, at the following public places:

- Hard Copy: Verkykerskop: VKB Verkykerskop, Between Harrismith & Memel on R722 Road;
- Hard Copy: Memel: Zamani Library, Eeufees Street
- Hard Copy: Harrismith: Harrismith Library, 27 Murray Street;

- Hard Copy: Newcastle: Newcastle Library, 66 Scott St, Newcastle CBD
- Electronic Copy: WSP Website (https://www.wsp.com/en-ZA/services/public-documents); and
- Electronic Copy: Datafree Website (https://wsp-engage.com/).

The Draft Reports were made available to Commenting Authorities via a One Drive link.

In order to ensure maximum participation of all I&APs, reports were shared on the Datafree website.

Proof of display is included in the FSR.

2.6.4 COMMENT AND RESPONSE REPORT

All concerns, comments, viewpoints, and questions (collectively referred to as 'issues') received during the comment period have been documented and responded to adequately in the SER which is included in this FSR. Where comments are project specific, this will be noted in the Comments and Response section of the SER. This will record the following:

- List of all issues raised;
- Record of who raised the issues;
- Record of where the issues were raised;
- Record of the date on which the issue was raised; and
- Response to the issues.

2.6.5 WAY FORWARD

2.6.5.1 Final Scoping Report Submission

All issues raised during the scoping phase of the proposed project have been incorporated into this FSR and will be addressed during the EIR Phase.

The DFFE will be allocated 43 days to review the FSR. This FSR will be placed on stakeholder review for a reasonable time period during the DFFE's final review and decision-making process. The delegated CA must within this specified timeframe issue a decision on whether to proceed onto the next phase, the EIR phase.

2.6.5.2 Ongoing Consultation and Engagement

In addition to the public documents distributed to stakeholders, there will be ongoing communication between the proponent, the EAP and stakeholders throughout the S&EIR process. These interactions include the following:

- In addition to the project announcement letters, a letter will be sent out to all registered stakeholders providing them with an update of the proposed project once the FSR has been approved;
- Interactions with stakeholders will take place in English and Afrikaans;
- Feedback to stakeholders, individually and collectively;
- Written responses (email, faxes or letters) will be provided to stakeholders acknowledging issues and providing information requested (dependent on availability); and
- As per the GNR 982, as amended, particular attention will be paid to landowners, and neighbouring communities, specifically where literacy levels and language barriers may be an issue.

2.7 ASSUMPTIONS AND LIMITATIONS

General assumptions and limitations:

- The EAP hereby confirms that they have undertaken to obtain project information from the client that is deemed to be accurate and representative of the project;
- Site visits have been undertaken to better understand the project and ensure that the information provided by the client is correct, based on site conditions observed;
- The EAP hereby confirms their independence and understands the responsibility they hold in ensuring all comments received are accurately replicated and responded to within the EIA documentation;
- The comments received in response to the public participation process, will be representative of comments from the broader community; and
- Based on the Pre-Application meeting and subsequent minutes, the CA would not require additional specialist input, in order to make a decision regarding the application.

Soil, Land Use and Land Capability:

- There are no specific assumptions, uncertainties or gaps in knowledge or data that affect the findings of this study.

Desktop Geotechnical Assessment:

- Your attention is drawn to Appendix E of the Geotechnical Assessment (**Appendix G.1**).
- The statements presented in this document are intended to advise you of what your realistic expectations of this report should be, and to present you with recommendations on how to minimize the risks associated with the groundworks for this project. The document is not intended to reduce the level of responsibility accepted by WSP, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

Visual Assessment:

- The layout of individual project components, specifically the locations of individual wind turbines, O&M building, substation, BESS, and temporary batching plants have not been finalised yet, and the findings of this VIA are based on the available preliminary development description. Initial recommendations regarding the location of specific project infrastructure, including potential “no-go” areas, visual impacts associated with the project and proposed mitigation measures as included in this report, are therefore preliminary in nature and will be revised and updated during the impact assessment phase
- Similarly, selection of specific technology has not been finalised in all instances. However, in most cases the specific choice of technology is not expected to materially influence the findings of the impact assessment, as the height and location of individual turbines are expected to be the most determining factor during the visual impact assessment
- Artificial landforms and structures, such as berms, stockpiles, buildings, and even tall vegetation will all impact the level of visibility of individual project components. However, given the limited development within study area the influence of these elements during the viewshed analysis to be conducted during the impact assessment phase is expected to be limited
- Determining the value, quality and significance of a visual resource or the significance of the visual impact that any activity may have on it, in absolute terms, is not achievable. The value of a

visual resource is partly determined by the viewer and is influenced by that person's socio-economic, cultural, and individual background, and is even subject to fluctuating and intangible factors, such as emotional mood and appreciation of "sense of place"

- This situation is compounded by the fact that the conditions under which the visual resource is viewed can change dramatically due to natural phenomena, such as weather conditions and seasonal change. Visual impact cannot therefore be measured simply and reliably, as is for instance the case with water, noise, or air pollution
- It is therefore not possible to conduct a visual assessment without relying to some extent on the expert opinion of a qualified consultant, which is inherently subjective. The subjective opinion of the visual consultant is however unlikely to materially influence the findings and recommendations of this study, as a wide body of scientific knowledge exists in the industry of VIA, on which findings are based.

Acoustic Assessment:

- The turbine specifications provided are assumed to be representative of what will be installed in reality.
- The turbine locations provided are assumed to be an accurate representation of where these will be located in reality. It is noted that the layout presented herein is a preliminary layout and may change slightly based on the sensitivity analysis from all specialist scoping studies.
- Identification of sensitive receptors is based on a desktop assessment, as well as input from the Client. It is assumed that all key receptors have been included. It is noted that the receptor locations will need to be confirmed/ground-truthed during the EIA phase of the Project.

Aquatic Assessment:

- The baseline description is qualitative, and is based on available national datasets and published literature for the study area region, and previous ecological studies conducted in the study area.

Terrestrial Biodiversity Assessment:

- The baseline description is qualitative, and is based on available national datasets and published literature for the study area region, and previous ecological studies conducted in the study area.

Avifaunal Assessment:

- The number and locations of turbines within the turbine area has been provisionally provided but will only be finalised over the course of the two-year monitoring programme.
- No information has yet been provided on the location and length of access roads to the turbines for maintenance and construction.
- No information has yet been provided on the location and length of access roads to the turbines nor the location of any Battery Energy Storage Systems (BESS).

Bats Assessment:

- This is a Scoping level assessment, based on desktop review work, a visual appraisal of major habitat types during two brief site visits, and no long-term passively recorded acoustic bat activity data. The preliminary sensitivity mapping must be refined, and the identified potential impacts must be fully assessed for each proposed WEF, once 12 months of monitoring have been completed. Inkululeko Wildlife Services reserves their rights to update the sensitivity mapping and identified impacts.

- It should be noted that not all cave and (especially old) mine tunnel locations are necessarily known in the region.
- Information on bat migration in South Africa is limited.

Traffic Assessment:

- This study is based on the project information provided by the client.
- According to the Eskom Specifications for Power Transformers (Eskom Power Series, Volume
  - 5: Theory, Design, Maintenance and Life Management of Power Transformers), the following dimensional limitations need to be kept when transporting the transformer – total maximum height 5 000 mm, total maximum width 4 300 mm and total maximum length 10 500 mm.
- It is envisaged that for this project, the inverter, transformer, and switchgear will be transported to site in containers on a low bed truck and trailer. A mobile crane and the transformer transport are the only abnormal load envisaged for the site. The crane will be utilised for offloading equipment, such as the transformers.
- Maximum vertical height clearances along the haulage route are 5.2 m for abnormal loads.
- If any elements are manufactured within South Africa but not on-site, these will be
  - transported from their respective manufacturing centres, which would be either in the greater Cape Town area, Johannesburg, or possibly Pinetown/Durban and Port Elizabeth.
- All haulage trips will occur on either surfaced national and provincial roads or existing gravel roads.
- Material for the construction of internal access roads will be sourced locally as far as
  - possible.
- The total number of turbines to be constructed for the WEF is estimated to be up to 55.
- The final access points are to be determined during the detailed design stage. Only
  - recommended access points at conceptual level can be given at this stage.
- An 18–24-month construction period is assumed with 48% of the construction period
  - dedicated to site prep and civil works.

Heritage Assessment:

- The study area was not subjected to a field survey as this will be conducted in the EIA phase. It is assumed that information obtained for the wider area is applicable to the study area and the authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the subsurface nature of cultural deposits, the possibility exists that some features or artefacts may not have been published. Similarly, the possible occurrence of graves and other cultural material cannot be excluded. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would be highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this scoping report.

Social Assessment:

- The information provided by the applicant is up-to-date and accurately represents the project.
- At the time of the compilation of this SIA report, the estimated number of people employed in the project was not disclosed.
- WSP was not provided with the estimated period of each project phase, namely the construction, operational and decommissioning phases.

- The public participation process has not been conducted yet and will form part of the scoping process for the EIA. Once this process is completed, it will inform this SIA further.
- The secondary data is assumed to reflect the local social context accurately.

3 PROJECT DESCRIPTION

This section provides a description of the location of the project area and the site location alternatives considered for the project. The descriptions encompass the activities to be undertaken during the construction and operational phases as well as the consideration for site accessibility, water demand, supply, storage, and site waste management. This section also considers the need and desirability of the project in accordance with Appendix 1 of GNR 326.

3.1 PROPERTY DETAILS

The Groothoek WEF is located within the PLM and TMDM, in the Free State Province (**Figure 1-1**).

The details of the property associated with the Groothoek WEF, including the 21-digit Surveyor General (SG) codes for the cadastral land parcels are outlined in **Table 3-1**. The co-ordinates of the cadastral land parcels are included in **Table 3-2**, and the coordinates of the property boundaries associated with the proposed Groothoek WEF is shown in **Figure 3-1**.

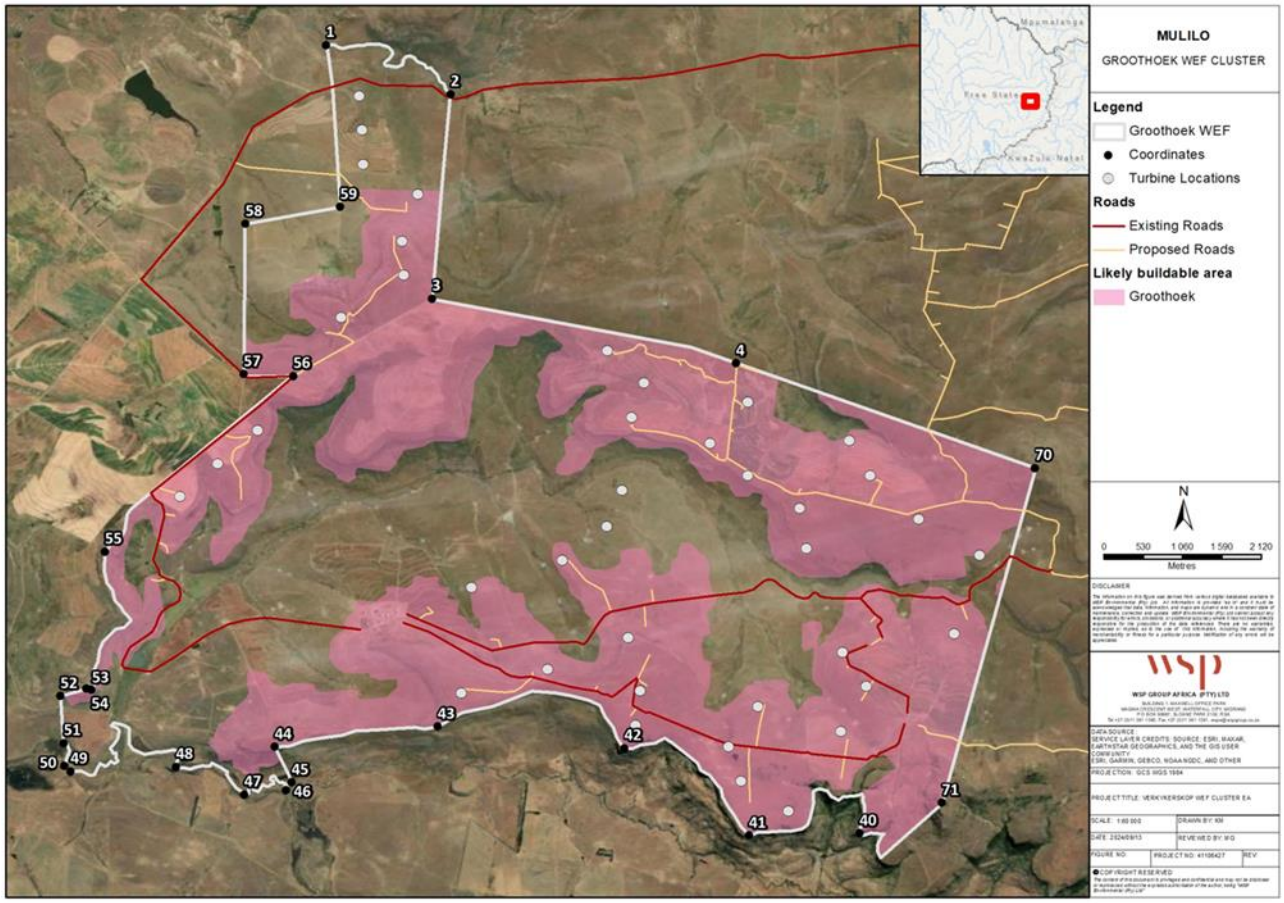

Figure 3-1 – Preliminary Layout and Coordinates of the boundary of the properties associated with the proposed Groothoek WEF

Table 3-1 – Groothoek WEF Affected Farm Portions

Farm Name	21 Digit Surveyor General Code of Each Cadastral Land Parcel
Portion 0 of Farm Schoonzicht No.80	F01500000000008000000
Portion 0 of Farm Groothoek No. 89	F01500000000008900000
Portion 0 of Farm Kromdraai No. 273	F01500000000027300000
Portion 0 of Farm Kransbank No.288	F01500000000028800000
Portion 0 of Farm Kranspunt No.459	F01500000000045900000
Portion 0 of Farm Van Kope No.1319	F01500000000131900000

Table 3-2 – Coordinate Points of the Cadastral Land Parcel

Point	Longitude	Latitude
1	27°56'5.10"S	29°25'52.05"E
2	27°56'26.65"S	29°26'46.46"E
3	27°57'55.90"S	29°26'38.34"E
4	27°58'24.20"S	29°28'51.21"E
40	28° 1'49.46"S	29°29'45.39"E
41	28° 1'50.41"S	29°28'57.01"E
42	28° 1'12.28"S	29°28'2.56"E
43	28° 1'2.76"S	29°26'40.89"E
44	28° 1'11.67"S	29°25'29.57"E
45	28° 1'27.16"S	29°25'36.92"E
46	28° 1'30.65"S	29°25'34.34"E
47	28° 1'32.46"S	29°25'16.19"E
48	28° 1'20.41"S	29°24'46.45"E
49	28° 1'22.36"S	29°24'0.23"E
50	28° 1'20.05"S	29°23'57.59"E
51	28° 1'10.09"S	29°23'57.13"E
52	28° 0'49.49"S	29°23'55.77"E

Point	Longitude	Latitude
53	28° 0'46.12"S	29°24'7.02"E
54	28° 0'46.70"S	29°24'9.40"E
55	27°59'46.43"S	29°24'15.16"E
56	27°58'29.65"S	29°25'37.62"E
57	27°58'28.85"S	29°25'15.90"E
58	27°57'23.24"S	29°25'16.56"E
59	27°57'15.78"S	29°25'58.11"E
70	27° 59' 9.891"S	29° 31' 2.067"E
71	28° 1' 36.130"S	29° 30' 21.322"E

3.2 PROJECT ACTIVITY

3.2.1 WIND ENERGY POWER GENERATION PROCESS

Wind power is the conversion of wind energy into a useful form of energy, such as electricity, using modern and highly reliable wind turbines. Wind Power is non-dispatchable, meaning that for economic operation, all the available output must be taken when it is available.

Wind turbines, like windmills, are mounted on a tower to harness wind energy at an increased level above the ground where wind is faster and less turbulent. The kinetic energy of the wind is used to turn the blades of the turbine to generate electricity. Wind turbines can operate at varying wind speeds, with the amount of energy the wind transfers to the rotor depending on the density of the air, the rotor area and the wind speed.

The electricity generated by the wind turbines is passed through the step-up transformer and then transmitted via either underground or overhead cables to a central substation, which connects the wind energy facility to a high voltage network. Wind turbines are designed to operate automatically with minimal maintenance for approximately 20-25 years.

Figure 3-2 illustrates the following main components of a wind turbine:

- The rotor consists of three blades which are attached to a hub. The blades collect energy from the wind and converts the wind energy into rotational shaft motion/energy to turn the generator;
- The nacelle houses the equipment at the top of the tower as well as a gearbox, a generator that converts the turning motion/mechanical energy of the blades into electricity and coupling and brake;
- The tower supports the nacelle and rotor and allows the blades to be distanced safely off the ground so as to reach the stronger winds found at higher elevations;
- Turbine step-up transformer which can be indoor or outdoor, depending on the turbine model whose function is to increase the voltage capacity of the electricity generated by the turbine to a higher grid equivalent.
- The foundation unit ensures the stability of the turbine structure.

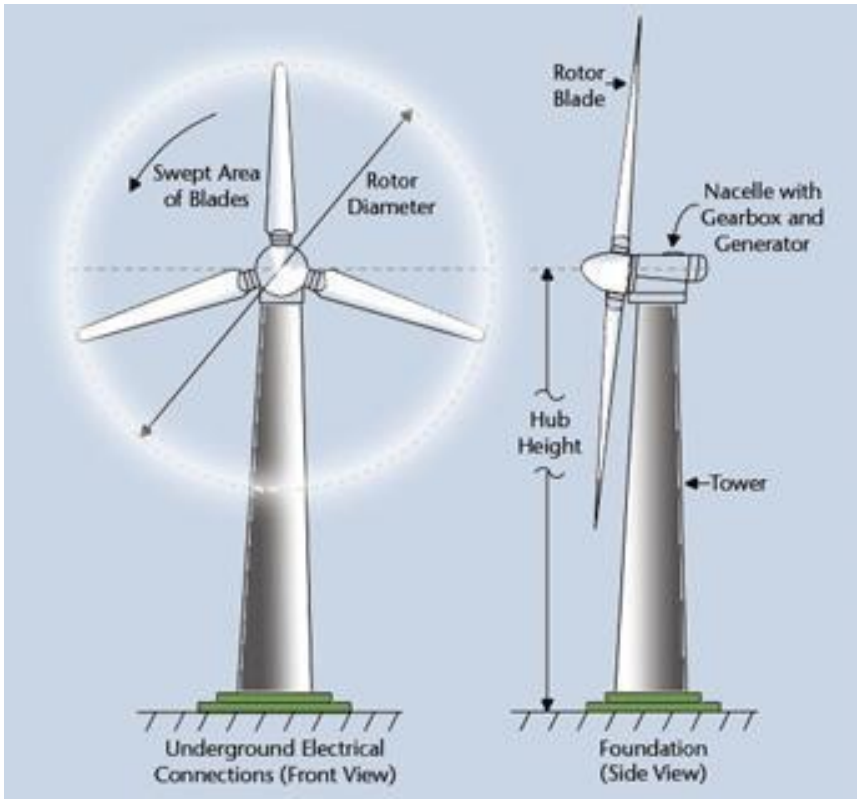

Figure 3-2 - Illustration of the main components of a wind turbine

3.2.2 BESS TECHNOLOGY

The Groothoek WEF includes the development of a BESS. There is a growing need for renewable energy technologies, such as solar and wind, to be able to supply a reliable source of electricity to the grid. Since solar and wind technology depend on whether the sun is shining or the wind is blowing, respectively, these technologies are only efficient when these sources are available. Battery storage systems allow for fluctuating renewable energy sources to be as stable as conventional systems and also provide a means to decouple generation of electricity from its use (i.e. provide electricity to the grid during peak demand) and therefore minimising supply and demand related issues.

Given the ongoing improvement in battery storage technology and the significant advantages of combining battery storage with wind farms, it makes sense to include a battery facility with WEF.

3.2.2.1 Battery Type

It is proposed that Lithium Battery Technologies will be considered as the preferred battery technology. This is due to them being a mature and safe technology with regard to potential impacts on the environment in a WEF, modular and easy to install and due to their technical characteristics, will work well as energy storage systems for wind facilities, as well as supporting grid stability. Lithium Battery Technologies arrive on site pre-assembled.

BESS consist of two main parts: battery modules and the accompanying Battery Management System (BMS), and a Power Conditioning System (PCS) used to enable the interface of the batteries to the grid. Individual battery cells are connected in a series/parallel arrangement in order to obtain the desired nominal voltage for highest efficiency and required storage capacity. The PCS is a

bidirectional power conversion device (inverter), enabling AC power from the grid to be converted to DC to charge the batteries in a controlled manner, and discharge DC battery power to feed AC power onto the grid (**Figure 3-3**).

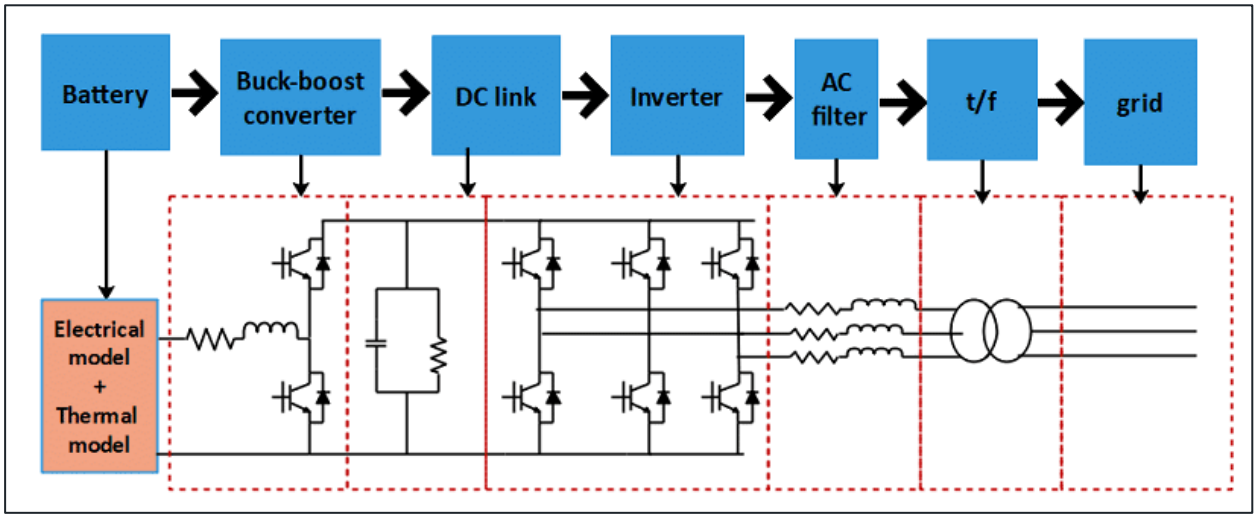

Figure 3-3 - BESS components Schematic

Source: www.researchgate.net

3.2.2.2 Compliance with local and international standards

The cells, modules, racks and the complete facility will be compliant with all local laws and regulations and health and safety requirements governing such battery facilities. Over and above that they will comply with international standards such as UN 38.3 (Transportation Testing for Lithium Batteries), UL 1642 (Standard for Safety – Lithium-ion Batteries) and IEC 62619 (Secondary cells and batteries containing alkaline or other non-acid electrolytes Safety requirements for secondary lithium cells and batteries, for use in industrial applications). Furthermore, the battery facility will also comply with standards such as UL 1973 (Batteries for Use in Stationary Applications) and IEC 62619-2017 including thermal runaway non-propagation and safety zone region operation limits and a failure mode analysis. The design will be compliant with UL 9540 (Energy Storage Systems and Equipment): this standard defines the safety requirements for battery installation in industrial and grid connected applications.

3.3 PROJECT INFRASTRUCTURE

The Groothoek WEF will be developed to allow for up to 300 MW for export from the facility. The proposed development footprint is approximately 150 hectares (ha) (subject to finalisation based on technical and environmental requirements), and the extent of the project area is approximately 6 170 ha (i.e. the area of the applicable farm portions associated with the Project). The development footprint includes the wind turbines and all associated infrastructures as indicated in **Table 3-3**. **Figure 3-4** illustrates the typical turbine hard-standing requirements.

Table 3-3 – Technical details of the Groothoek WEF

Aspect	Details
Total Buildable Area (I.e. likely footprint area)	• Approximately 150ha. • (Subject to finalization based on technical and environmental requirements)
Export Capacity	• Up to 300MW • (Subject to finalization based on technical and environmental requirements)
Technology	• Wind
Number of Wind Turbines	• Up to 55
Rotor Diameter	• Up to 200m
Hub Height	• Up to 140m
Hard Standing Footprint	• Up to 0,8 ha per turbine
Turbine Foundations	• Excavation up to 4 m deep, constructed of reinforced concrete to support the mounting ring. • Once tower established, footprint of foundation is covered with soil.
Substation	• 1 x 33kV/132kV onsite collector substation (IPP Portion), being up to 2ha.
Powerlines	• 33kV cabling to connect the wind turbines to the onsite collector substation, to be laid underground where practical and ecologically acceptable.
Construction camp and laydown area	• Construction compounds including site office inclusive of • Concrete Batching plant of up to 1ha • Site office of 4 ha • Laydown area of 8ha
Internal Roads	• Up to 8m in width (operational road surface width excluding V drains and cabling). During construction the disturbed road footprint will be up to 14m wide including v-drains and trenching for cabling)
O&M Building	• O&M office of up to 1ha.
BESS	• Battery Energy Storage System (BESS) (200MW/800MWh). • Pre-assembled solid state batteries • Export Capacity of up to 800MWh • Total storage capacity 200MW • Storage capacity of up to 6-8 hours

Aspect	Details
	The BESS will be housed in containers covering a total approximate footprint of up to 7ha

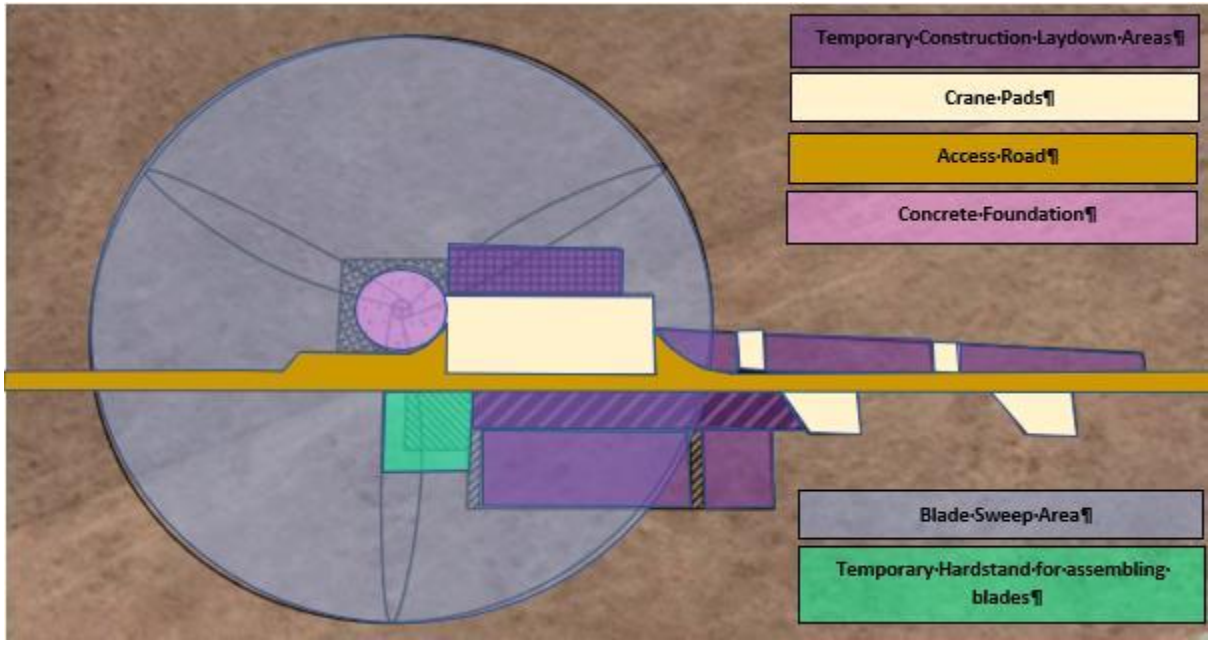

Figure 3-4 - Typical Turbine Hard Standing Requirements (illustration purposes only)

3.4 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

3.4.1 CONSTRUCTION PHASE

The construction process will follow industry standard methods and techniques. Key activities associated with the construction phase are described in **Table 3-4**.

Table 3-4 – Construction activities

Activity	Description
Establishment of access and internal roads	Up to 8m in width (operational road surface width excluding V drains and cabling). During construction the disturbed road footprint will be up to 14m wide including v-drains and trenching for cabling)
Site preparation and establishment	Site establishment will include clearing of vegetation and topsoil at the footprint of each turbine, for laydown areas and along access and cable routes. The temporary laydown area will be constructed, including establishment of the construction camp (temporary offices, storage containers, concrete batching plant, concrete wind tower factory, etc). Site establishment will also entail the installation and/or connection of services (sanitation, electricity etc).
Transport of components and equipment to site	Bulk materials (aggregate, steel etc.), infrastructure components (masts, blades, tower sections etc), lifting and construction equipment (excavators, trucks, compaction equipment etc.) will be sourced and transported to site via suitable National and provincial routes and designated access roads.

Activity	Description
	The infrastructure components may be defined as abnormal loads in terms of the Road Traffic Act (Act 29 of 1989) due to their large size and abnormal lengths and loads for transportation. A permit may be required for the transportation of these loads on public roads.
Excavation and earthworks	Subject to the determination of founding specifications, earthworks will be required. This is likely to entail: • Excavations for foundations to a depth of approximately 4.5m, and pouring of concrete foundations of approximately 950m^3 from the batching plant. Concrete foundations will be constructed at each turbine location • Levelling of the construction camp area, substation area, and O&M building area, and excavation of foundations prior to construction. • Excavation of trenches for the installation of underground cables. • Earthworks for access roads and crane pads will be performed as per the turbine' specific transport, delivery and erection requirements.
Construction of wind turbines, site substation and BESS	A large lifting crane(s) will be required to lift the turbine sections (nacelle, blades) into place. The lifting crane/s will be brought on site and will be required to move between the turbine site. Cranes of varying sizes may be required depending on the size of the components. An IPP substation will be constructed on the site. The wind turbines will be connected to the IPP substation via underground or overhead (if required) up to 33kV electrical cables. The BESS will typically require the placement of multiple containers to house the BESS components.
Establishment of ancillary infrastructure	Ancillary infrastructure will include construction site office, temporary laydown area and workshop area for contractor's equipment.
Rehabilitation	Once all construction is completed on site and all equipment and machinery has been removed from the site, the site will be rehabilitated.

3.4.2 OPERATIONAL PHASE

During operation the key activities will include inspection and maintenance of the wind turbines, substations, BESS, and other associated infrastructure.

3.4.3 DECOMMISSIONING PHASE

Following the initial 20-year operational period of the WEF, the continued economic viability will be investigated. If the facility is still deemed viable, the life of the facility will be extended. The facility will only be decommissioned once it is no longer economically viable. If a decision is made to completely decommission the facility, this will be subject to a separate authorisation and impact assessment process, all the components will be disassembled, reused and recycled or disposed.

The decommissioning phase will include activities similar to that of the construction phase as indicated in **Table 3-4**.

The site will be rehabilitated and returned to its current use i.e., agriculture.

3.5 NEED AND DESIRABILITY

The proposed activity is a direct result of the growing demand for electricity and the need for renewable energy in South Africa. According to Eskom, the demand for electricity in South Africa has been growing at approximately 3% per annum. This growing demand, fuelled by increasing economic growth and social development, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmentally responsible development, the impacts of climate change and the need for sustainable development.

South Africa is the seventh highest coal producer in the world, with approximately 77% of the country's electricity generated from coal. This large dependence on coal and its use has also resulted in a variety of negative impacts on the environment, including the contribution to climate change. South Africa is also the highest emitter of greenhouse gases in Africa; attributed to the country's energy-intensive economy that largely relies on coal-based electricity generation.

Renewable energy development is regarded as an important contribution to meeting international and national targets of reducing reliance on fossil fuels, such as coal, which contribute towards greenhouse gas emissions and resultant climate change. The need and desirability of the proposed Groothoek WEF has been considered from an international, national, and regional perspective.

3.5.1 INTERNATIONAL PERSPECTIVE

The proposed project will align with internationally recognised and adopted agreements, protocols, and conventions. This includes the Kyoto Protocol (1997) which calls for countries internationally to reduce their greenhouse gas emissions through cutting down on their reliance on fossil fuels and investing in renewable energy technologies for electricity generation. The proposed project will therefore add capacity to the energy sector and generate electricity without greenhouse gas emissions and meet international requirements in this regard.

South Africa is also signatory to the United Nations' Development Programmes' (UNDP) Sustainable Development Goals (SDGs), particularly SGD 7 relating to affordable and clean energy. The proposed project qualifies as a clean technology that will generate up to 150MW of affordable energy to contribute to South Africa's energy mix.

The project will also greatly contribute to the countries' efforts to reduce their carbon emissions and play their role as part of the Paris Climate Accord. The Paris Agreement is a legally binding international treaty signed by 196 countries at the COP 21 in Paris, on the 12th of December 2015 to combat climate change. The goal of the Paris Accord is to limit global warming to well below 2 degrees Celsius, compared to industrial levels to avoid catastrophic natural disasters which are driven by the global temperature increase. Therefore, to achieve this long-term temperature goal, countries aim to reach global peaking of greenhouse gas emissions as soon as possible to achieve a climate-neutral world by 2050.

At COP27 President Sameh Shoukry announced the *Sharm el-Sheikh Adaptation Agenda*[1], enhancing resilience for people living in the most climate-vulnerable communities by 2030. The cover decision, known as the Sharm el-Sheikh Implementation Plan, highlights that a global transformation to a low-carbon economy is expected to require investments of at least USD 4-6 trillion a year. The Sharm el-Sheikh Implementation Plan emphasises the urgent need for reduced global greenhouse gas emissions through the use of renewable energy, just energy transition partnerships and other cooperative actions. The Plan further highlights that this is a critical decade of action that requires rapid transformation towards renewable energy.

This renewable energy project aligns with the goals of the Sharm el-Sheikh Implementation Plan and the need to reduce greenhouse gas emissions and rapidly transform towards renewable energy.

3.5.2 NATIONAL PERSPECTIVE

The South African Government, through the IRP (2010-2030), has set a target to secure 17 800 MW of renewable energy by 2030. This is an effort to diversify the country's energy mix in response to the growing electricity demand and promote access to clean sources of energy.

The National Development Plan (NDP) is aimed at reducing and eliminating poverty in South Africa by 2030. The NDP also outlines the need to increase electricity production by 2030, with 20 000 MW of electricity capacity generated from renewable sources in order to move to less carbon-intensive electricity production. The Plan also envisages that South Africa will have an energy sector that provides reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.

The authorisation of the Groothoek WEF will further align with South Africa's National Climate Response White Paper which outlines the countries efforts to manage the impacts of climate change and to contribute to the global efforts to stabilize the greenhouse gases concentrations in the atmosphere.

The proposed Groothoek WEF will pave the way for the Just Energy Transition (JET) in South Africa and promote the transition from a fossil fuel-based economy to a low carbon economy. The proposed Groothoek WEF aims towards the aforementioned national energy targets of diversification of energy supply and the promotion of clean energy. Wind and solar energy developments contribute to reduced emissions and subsequently climate change whilst promoting industrial development and job creation.

The proposed Groothoek WEF will also aid in overcoming possible future power. In 2022, South Africa witnessed its longest recorded hours of load shedding, with the power being off for 1 949 hours between January and September 2022 as shown in **Figure 3-5**. The South African Government has taken strides to try reducing these power cuts through the implementation of bid Windows in REIPPP, but it is still expected that the country will undergo more load shedding. Over the years the construction of Solar and Wind facilities has become cheaper, and less time-

[1] https://unfccc.int/news/cop27-reaches-breakthrough-agreement-on-new-loss-and-damage-fund-for-vulnerable-countries

consuming. Thus, acting as a faster and more efficient method of meeting the ever-growing demand for electricity in the country. Renewable energy is a key factor in the national energy mix and will help assist in ensuring that load shedding is prevented in South Africa.

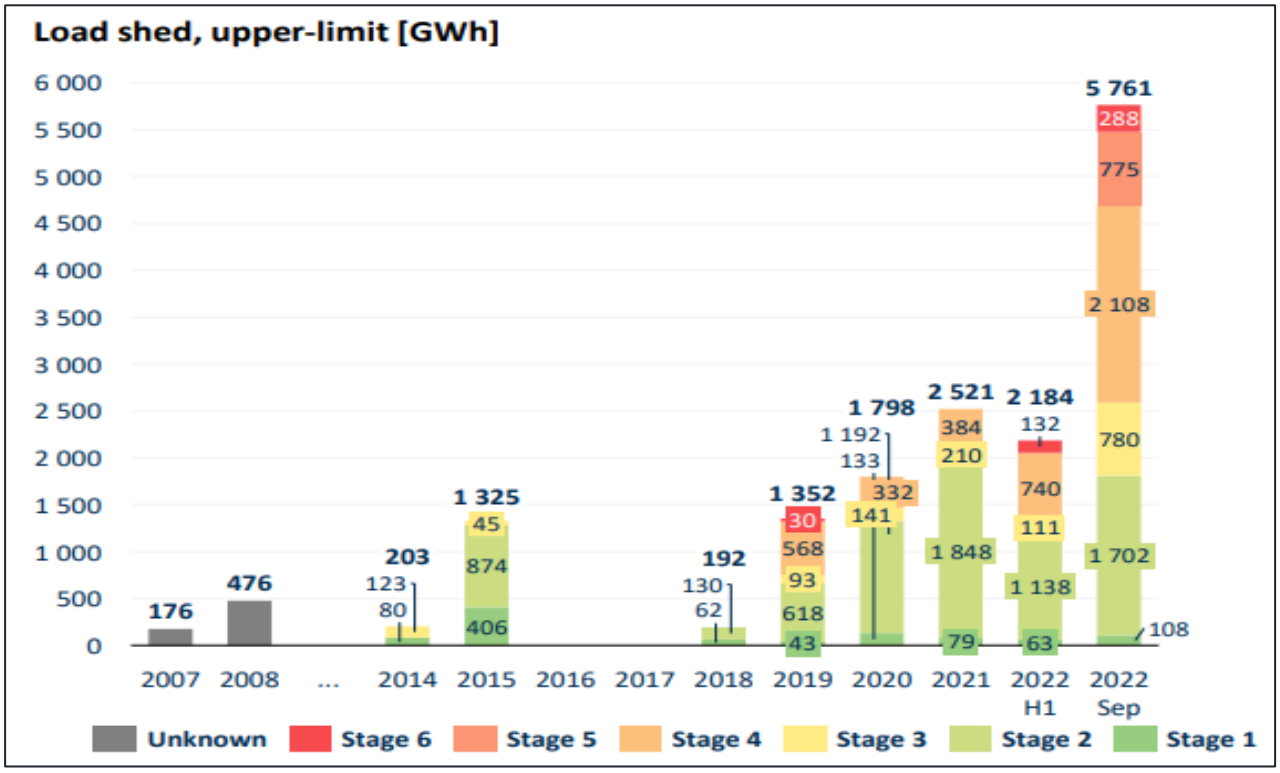

Figure 3-5 - Load shedding hours over the years in South Africa

Source: CSIR (2022)

3.5.3 REGIONAL AND LOCAL PERSPECTIVE

3.5.3.1 Just Energy Transition

Coal power stations and the coal mining industry play a vital component in the economic and social components of the l economy. Shifting to a low carbon economy will thus need to offset or exceed the benefits being realized by fossil fuels in the province. Thus, a key factor to ensuring the success of the JET is not only to focus on the transition from fossil fuels to renewable energy resources but to simultaneously ensure the Just Transition of jobs and skills.

The transition towards renewable energy will improve the socio-economic conditions of the TMDM. The TMDM recorded an unemployment rate of 32.9%, with the majority of its employed in the trade and community services sectors. The Project will aid in solving two of the leading challenges faced by the TMDM, namely the cost of electricity and lack of adequate employment opportunities

The renewable industry will create job opportunities throughout the supply chain. The renewable industry will contribute to the Just transition in South Africa to ensure that there are no job losses but rather job transfers and skill exchange. For these opportunities to arise, renewable energy projects need to be approved in the Free State Province to ensure that the transition from fossil fuels to renewable energy happens gradually and takes off effectively.

4 PROJECT ALTERNATIVES

The EIA Regulations of 2014 (as amended) require that the S&EIR process must identify and describe alternatives to the proposed activity that were considered, or motivation for not considering alternatives. Different types or categories of alternatives could be considered including different locations, technology types, and project layouts. At the scoping level the evaluation of alternatives is provided at a high level in the absence of detailed environmental comparators for each alternative; due to the two-staged nature of the S& EIA process it is more suitable to identify and describe the potential alternatives on a high-level basis within scoping, and to perform a more detailed analysis of alternatives (with environmental comparators) in the EIA phase of the project. As such, the S&EIR will holistically assess the impacts and risks of each alternative comparatively, as suggested by Appendix 2 of the EIA Regulations of 2014 (as amended).

All alternatives outlined below are considered both feasible and reasonable with no apparent advantages or disadvantages at this stage of the project. All alternatives will be described and assessed in more detail during the EIA Phase.

Extensive consideration of alternatives and avoidance of impacts took place in the screening/design phase. This is discussed in detail in the section below.

4.1 TECHNOLOGY ALTERNATIVES

4.1.1 WIND TECHNOLOGY

The Groothoek WEF will utilise wind technology to generate power. Therefore, no technology alternatives are being considered for this project. The motivation for the use of wind technology for this project is provided below:

4.1.1.1 Wind Resource

The Project site was primarily selected on the availability of very good wind resource in the Free State region. The availability of the wind resource is the main drivers of project viability. The Project site was identified by the proponent through a desktop pre-feasibility analysis based on the estimation of the wind energy resource. The average annual wind speed for the site was considered sufficient to ensure the economic viability of a wind energy facility. 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 indirect benefits for the South African economy.

4.1.1.2 Topography

The surrounding landscape has a rolling hill topography which is suitable for the development of a wind project (and unsuitable for other technologies, e.g. Solar PV). The Project site itself is located on the highest lying ground in the area thus has the greatest wind resource within the immediate area.

4.1.1.3 Competition

There is minimal competition in the area with regards to authorised or operational WEFs.

4.1.2 BESS TECHNOLOGY

The BESS will be made up of Lithium-Ion batteries or similar solid-state technology due to them being a mature and safe technology with regard to potential impacts on the environment in a wind facility farm, modular and easy to install and due to their technical characteristics, will work well as energy storage systems for wind facilities, as well as supporting grid stability. No other BESS technology is being considered for this project.

4.2 LOCATION ALTERNATIVES

The selection of the Groothoek WEF site is the outcome of a feasibility assessment by the proponent, which inter alia served to identify site options that would be optimal for energy production and grid interconnection. The Groothoek WEF site was selected because it is strategically located due to the following factors:

- **Proximity to the Eskom grid** – The proposed wind energy facility requires connection to the Eskom grid to transmit the generated electricity. The Project site was selected due to its proximity to the National Grid which will have sufficient capacity to allow the Project to connect to it. A new Main Transmission Substation will be built (to form part of a separate EIA) and will have a loop in loop out into an existing 400kV line.
- **Land Availability and Landowner Support** – The availability of land is a key feasibility criterion in the site selection process. The project site is of a suitable land size for the proposed development. The land available for the development of the Groothoek WEF extends over approximately 6 170 ha, providing a substantial amount of land for the development of an up to 300MW WEF. The proponent has secured sufficient land for the development of the proposed WEF with landowners within the respective cadastral portions comprising the development footprint, indicating their support and willingness for the project to proceed to development via entering into agreement with the developer. After intensive studies around the province, through analysing the aforementioned factors, it was determined that this site has the most ideal conditions for the Project.
- **Strategic Approach** – Four of Eskom's coal-fired power stations are targeted for decommissioning in the short term. These include the Komati, Camden, Grootvlei, and Hendrina power stations. These power stations range between 50 - 60 years of age. According to the 2019 IRP, over an 11-year period Eskom are expected to decommission over 11GW of its coal fired capacity. Power generated from the WEF can therefore be used to replace a portion of the generation capacity lost from the decommissioned power stations, and also help replace some of the jobs that would have been potentially lost due to the decommissioning of the power plants.
- **Road and labour pool accessibility** – The Project site can be accessed easily via the R722 which runs in a north-south trajectory to the west of the site.
- **Topography** - The surrounding landscape has a mountainous topography which is suitable for the development of a wind project. The Project site itself is located on a high lying landscape that has the highest wind resource within the immediate area.
- **Competition** - With regards to renewable energy facilities, there is minimal competition in the area in terms of existing operational projects. Should the project proceed, it will act as one of the pioneering developments in the Verkykerskop area and will open opportunities for other renewable developments. . It will also serve as a large-scale case study for wind resource in the

province, showing that commercially viable wind energy facilities are suitable for certain parts of the Free State Province.

The site is considered suitable for the reasons provided. The investigation of an alternative site is not currently proposed within this Scoping Report.

There is no site alternative for the Groothoek WEF.

4.3 LAYOUT ALTERNATIVES

The preliminary layout identified up to 55 turbine positions and associated main WEF components and was proposed during the Scoping phase. The preliminary layout is illustrated in **Figure 4-1**.

Due to the nature of the project area, the specialists were requested to identify the sensitive areas within the study area. These sensitive areas will be overlaid and utilised to revise and optimised the layout accordingly.

The results of the scoping phase sensitivity mapping overlain by the preliminary layout are illustrated in Section 8 of this report. **The preliminary layout will be adjusted to accommodate the specialist recommendations during the EIA phase, as more detailed surveys are undertaken**.

The development of the Groothoek WEF layout is not yet final.

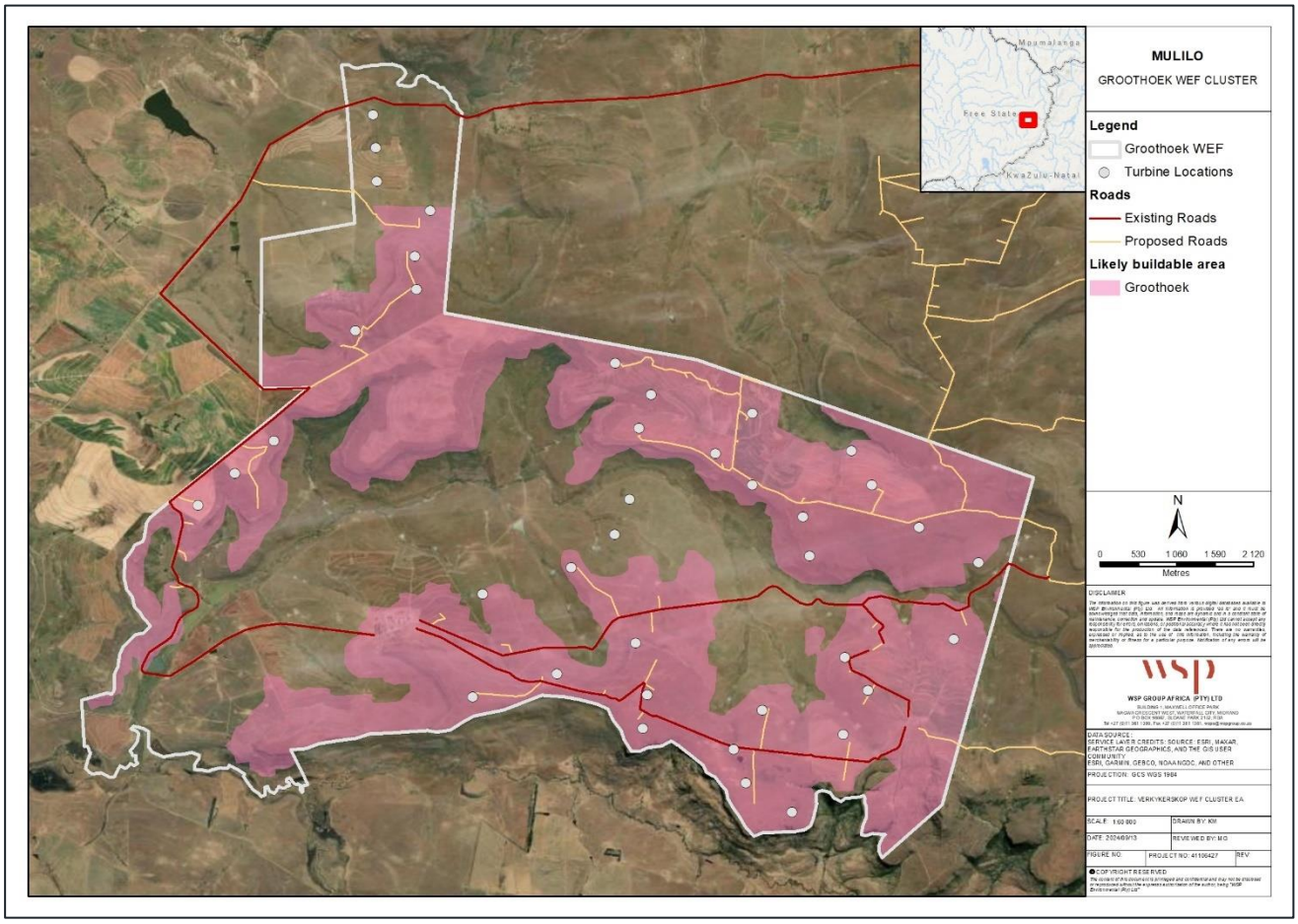

Figure 4-1 - Preliminary Layout for Groothoek WEF

4.4 NO-GO ALTERNATIVE

The no-go alternative would be if the project were not to be developed.

In the “no project” alternative, the proposed project will not be developed. In this scenario, there could be a missed opportunity to address the need for a just transition within the Province and Nationally. This project will also support the need to increase renewable energy generation in an effort to mitigate against concerns of climate change and exploitation of non-renewable resources. The no-go alternative would not assist in responding to the growing electricity demand in South Africa and would not contribute to the reliability of electricity supply at a national scale.

The “no project” alternative will be considered in the EIA phase as a baseline against which the impacts of the proposed project will be assessed. The no-go alternative will be discussed in more detailed during the EIA Phase.

5 GOVERNANCE FRAMEWORK

5.1 NATIONAL ENVIRONMENTAL LEGAL FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in **Table 5-1**.

As per the EIA Regulations 2014, as amended, Appendix 2 of GNR 982 Section (d), the listed activities are outlined in **Table 5-1**.

Table 5-1: Applicable National Legislation

Legislation	Description of Legislation and applicability
The Constitution of South Africa (No. 108 of 1996)	The Constitution underpins the international principle that everyone has the right to an environment that is not harmful to their health or well-being. This fundamental human right is effected in Section 24 of the Constitution. The Constitution cannot manage regulate environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld on an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights. NEMA is the principal environmental statute which regulates environmental management and seeks to give effect to the environmental right enshrined in section 24 of the Constitution.
National Environmental Management Act (No. 107 of 1998)	NEMA provides that an Environmental Authorisation (EA) is required by any person that intends to undertake certain listed activities that are considered likely to have a detrimental impact on the environment and have been identified in Listing Notice 1 (GN R983, GG 38282 of 4 December 2014), Listing Notice 2 (GN R984, GG 38282 of 4 December 2014), or Listing Notice 3 (GN R985, GG 38282 of 4 December 2014) published under the Environmental Impact Regulations (EIA Regulations). No construction/development (broadly defined in the EIA Regulations) activities may commence without an EA being granted by the relevant competent authority (and/or where such EA has been suspended by virtue of, for example, an appeal having been lodged).The regulations outlining the procedures required for authorisation are published in the EIA Regulations of 2014 (GNR 982) (as amended). Listing Notice 1 identifies activities that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific high biodiversity areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. WSP undertook a legal review of the listed activities according to the proposed project description to conclude that the activities listed in in this section are considered applicable to the development: A S&EIR process must be followed. An EA is required and will be applied for with the DFFE.

Legislation	Description of Legislation and applicability
Listing Notice 1: GNR 983	*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*. **Description**: The proposed Groothoek WEF will include a 33kV/132kV onsite collector substation (inclusive of the IPP Portion). In addition, 33kV cabling is proposed to connect the wind turbines to the onsite collector substations, to be laid underground where practical.
Listing Notice 1: GNR 983	*Activity 12(ii)(a)(c)* *The development of—* *(ii) infrastructure or structures with a physical footprint of 100 square metres or more* *(a) within a watercourse* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.* *The development of—* *(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or* *(ii) infrastructure or structures with a physical footprint of 100 square metres or more* *(a) within a watercourse* *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.* *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; [or]* *(ee) where such development occurs within existing roads, [or] 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 the commencement of development and where indigenous vegetation will not be cleared.* **Description**: The proposed Groothoek WEF will require the development of internal roads and/or access roads around the site. The physical footprint of the infrastructure will be located within 32m of the outer extent of the delineated watercourses on site. The footprint of the infrastructure that will be within 32m of a watercourse will be confirmed in the EIA Phase.

Legislation	Description of Legislation and applicability
	The development of the Groothoek WEF will not trigger any of the listed exclusions.
Listing Notice 1: GNR 983	*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.* **Description:** The Groothoek WEF will require storage and handling of dangerous goods, including fuel, cement, and chemical storage onsite, that will be greater than 80m^3 but not exceeding 500m^3.
Listing Notice 1: GNR 983	*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*. *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.* ***Description:*** Internal access roads and stormwater control infrastructure, as well as electrical cabling required to connect the various components of the Groothoek WEF will collectively require the excavation, infilling or removal of soil exceeding 10m^3 from delineated watercourses on site. The exact values will be confirmed once final designs have been provided. The development of the Groothoek WEF will not trigger any of the listed exclusions.
Listing Notice 1: GNR 983	*Activity 24(ii)* *The development of a road:* *(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or* *(ii) A road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres* *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*

Legislation	Description of Legislation and applicability
	(c) which is 1 kilometre or shorter **Description:** The proposed Groothoek WEF will require the development of internal roads and/or access roads around the site. The roads will be up to 8m in width (operational width once constructed) with a road reserve wider than 13.5m. The development of the Groothoek WEF will not trigger any of the listed exclusions.
Listing Notice 1: GNR 983	*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.* **Description:** The proposed Groothoek WEF is considered a commercial and/or industrial development and is located on several farm portions zoned for agricultural use outside an urban area, used for agricultural purposes. The total area to be developed for each of the facilities (buildable area) will exceed 1ha and is estimated to be 150 ha. The development of the Groothoek WEF will not trigger any of the listed exclusions.
Listing Notice 1: GNR 983	*Activity 48(i)(a)(c)* *The expansion of—* *(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or* *(ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more* *where such expansion occurs—* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;* *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 14 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* **Description**:

Legislation	Description of Legislation and applicability
	Transport of large infrastructure components related to both facilities will require the expansion of existing access and/or internal roads, culverts or similar drainage crossing infrastructure collectively exceeding 100 m^2 or more beyond existing road or road reserves located within delineated watercourses on site, or within 32 m of the outer extent of the delineated watercourses on site. The development of the Groothoek WEF will not trigger any of the listed exclusions.
Listing Notice 1: GNR 983	*Activity 56(i)(ii)* *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 meters; or* *(ii) where no reserve exists, where the existing road is wider than 8 metres;* *excluding where widening or lengthening occur inside urban areas* **Description**: Transport of large infrastructure components related to the facilities will require the widening of existing access and/or internal roads where no reserve exists and where such road is wider than 8 metres. The development of the Groothoek WEF will not trigger any of the listed exclusions.
Listing Notice 2: GNR 984	*Activity 1(a)* *The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more,* **Description**: The proposed energy generation technology (i.e. Wind) will generate more than 20MW of electricity output from a renewable resource (estimated to be 300MW). This activity is therefore considered applicable to the wind facilities.
Listing Notice 2: GNR 984	*Activity 15(i)* *The clearance of an area of 20 hectares or more of indigenous vegetation.* **Description**: Based on the information provided with regards to total project area, it is assumed that the facilities will result in the clearance of at least 20 hectares or more of indigenous vegetation. The buildable area is currently estimated to be 150ha.
Listing Notice 3: GNR 985	***It has been confirmed that the 2015 Free State Biodiversity Sector Plan (FSBSP) was adopted by the Competent Authority on 14 October 2024.***
Listing Notice 3: GNR 985	*Activity 4(f)(i)(cc)(ee)* *The development of a road wider than 4 metres with a reserve less than 13,5 metres.* *b. Free State* *(i) Outside urban areas:* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* **Description**:

Legislation	Description of Legislation and applicability
	Internal access roads require 8m wide roads. The exact values will be confirmed once final designs have been provided. In addition, The Project area is noted to traverse CBAs and ESAs which are largely aligned with grassland, cultivated stands and several wetlands, as presented in the 2015 FSBP and the national landcover dataset (GTI, 2020)
Listing Notice 3: GNR 985	*Activity10(f)(i)(cc)(ee))(hh)* *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.* *b. Free State* *i. Outside urban areas:* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* *(hh) Areas within a watercourse or wetland, or within 100 metres of a watercourse or wetland;* **Description**: The Project area is noted to traverse CBAs and ESAs which are largely aligned with grassland, cultivated stands and several wetlands, as presented in the 2015 FSBP and the national landcover dataset (GTI, 2020). The Groothoek WEF will require storage and handling of dangerous goods, including fuel (e.g. diesel), cement and chemical storage onsite, that will be greater than 30m^3 but not exceeding 80m^3. It is anticipated that these facilities will be developed within CBAs or ESAs or within 100m of a watercourse.
Listing Notice 3: GNR 985	*Activity 12(f)(i)(ii)* *The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of Indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* *b. Free State* *(ii) Within critical biodiversity areas identified in bioregional plans; or* **Description:** The Project area is noted to traverse CBAs and ESAs which are largely aligned with grassland, cultivated stands and several wetlands, as presented in the 2015 FSBP and the national landcover dataset (GTI, 2020). It is anticipated that the construction of the Groothoek will require clearance of 300m^2 or more within the mapped CBAs and ESAs.
Listing Notice 3: GNR 985	*Activity 14(ii)(a)(c)(f)(i)(dd)(ff)* *The development of—* *(ii) infrastructure or structures with a Physical footprint of 10 Square metres or more;* *where such development occurs—* *(a) within a watercourse;*

Legislation	Description of Legislation and applicability
	(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; *b. Free State* *i. Outside urban 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* **Description**: The Project area is noted to traverse CBAs and ESAs which are largely aligned with grassland, cultivated stands and several wetlands, as presented in the 2015 Free State Biodiversity Plan and the national landcover dataset (GTI, 2020) The cabling, access and/or internal roads are anticipated to traverse the CBAs and ESAs identified within the project area and will require the development of infrastructure or structures with a physical footprint of 10m^2 or more.
Listing Notice 3: GNR 985	*Activity 18(f)(i)(cc)(ee)* *The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.* *b. Free State* *i. Outside urban areas:* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* **Description** The Project area is noted to traverse CBAs and ESAs which are largely aligned with grassland, cultivated stands and several wetlands, as presented in the 2015 FSBP and the national landcover dataset (GTI, 2020). Transport of large infrastructure components related to the facilities will require the widening of existing access and/or internal roads by more than 4 metres or the lengthening of existing access and/or internal roads by more than 1km within the Free State Province and outside urban areas. The existing access and/or internal roads are anticipated to traverse watercourses, CBAs and ESAs.
Listing Notice 3: GNR 985	*Activity 23(ii)(a)(c)(f)(i)(cc)(ee)* *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;* *b. Free State* *i. Outside urban areas:*

Legislation	Description of Legislation and applicability
	(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; **Description**: The Project area is noted to traverse CBAs and ESAs which are largely aligned with grassland, cultivated stands and several wetlands, as presented in the 2015 FSBP and the national landcover dataset (GTI, 2020). The cabling, access and/or internal roads are anticipated to traverse the ESAs associated with the wetland areas and will require the expansion of infrastructure or structures with a physical footprint of 10m^2 or more.
Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes (GNR 320, 20 March 2020 and GNR 1150, 30 October 2020)	The protocols provide the criteria for specialist assessment and minimum report content requirements for impacts for various environmental themes for activities requiring environmental authorisation. The protocols replace the requirements of Appendix 6 of the EIA Regulations, 2014, as amended. The assessment and reporting requirements of the protocols are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (screening tool). The Screening Report was generated for the project on 30 September 2024 (**Appendix E**). The following environmental themes were applicable to the Groothoek WEF: • Agricultural Theme; • Animal Species Theme; • Aquatic Biodiversity Theme; • Archaeological and Cultural Heritage Theme; • Avian (Wind) Theme; • Bats (Wind) Theme; • Civil Aviation Theme; • Defence Theme; • Flicker Theme; • Palaeontology Theme; • Plant Species Theme; • Noise Theme; • Landscape (Wind theme); • Terrestrial Biodiversity Theme; and • Vulture Theme.
National Environmental Management: Waste Act (59 of 2008) (NEM:WA)	This Act provides for regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation. The Act also provides for the licensing and control of waste management activities through GNR. 921 (2013): List of Waste Management Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment. The proposed project does not constitute a Listed Activity requiring a Waste Management Licence (WML) as defined in GNR 921. The Environmental Management Programme (EMPr) that will accompany the EIA Report, will include reasonable measures for the prevention of pollution and good international industry practice (GIIP).
National Environmental Management:	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) was promulgated in June 2004 within the framework of NEMA to provide for the management and conservation of national biodiversity. The NEMBA's primary

Legislation	Description of Legislation and applicability
Biodiversity Act, 2004 (Act No. 10 of 2004)	aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, the NEMBA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI). SANBI was established by the NEMBA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems. The biodiversity assessment identifies CBAs which represent biodiversity priority areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and classification of land portions requiring safeguarding in order to meet national biodiversity objectives. Based on the preliminary desktop assessment and the Scoping terrestrial biodiversity report, a significant part of the Project Area falls within CBA (Irreplaceable and Optimal). According to the description for the FSBSP Terrestrial Assessment categories, CBAs are areas that are required to meet biodiversity targets (for biodiversity pattern and ecological process features). The management approach is that they should remain in a natural state. CBAs are areas of high biodiversity value which are usually at risk of being lost and usually identified as important in meeting biodiversity targets, except for Critically Endangered Ecosystems or Critical Linkages. CBAs in the Province can be divided into two sub-categories: • Irreplaceable (parts of the site are within this sub-category), and • Optimal (northern parts of the site are within this sub-category). Supplementary baseline terrestrial ecology studies will be undertaken during the EIA phase to inform the assessment of impacts and will include flora and fauna surveys of the project footprint to determine the presence of flora and fauna species of concern (SoC), and bird surveys of the area to define the potential risks to bird SoC. The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) Regulations with regards to alien and invasive species have been superseded by the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014. Specific management measures for the control of alien and invasive plants will be included in the EMPr. Furthermore, the Multi-species Biodiversity Management Plan for Vultures in South Africa has been developed in terms of section 43(1)(b) and (c) and 43(3)(a) and (b) of the NEMBA.
National Biodiversity Offset Guideline (Issued Under Section 24j Of The National Environmental Management Act) (First Edition (October 2021)	The purpose of this guideline is to indicate when biodiversity offsets are likely to be required as mitigation by any competent authority (CA), to lay down basic principles for biodiversity offsetting and to guide offset practice in the environmental authorisation (EA) application context. This guideline is therefore applicable to applications for EA in terms of section 24 of NEMA. However, it can also be used to inform other administrative processes that may involve biodiversity offsetting, including applications for EA in terms of section 24G of NEMA, emergency directives contemplated in section 30A of NEMA, applications for licences under the National Water Act, 1998, the National Forests Act, 1998 and the National Environmental Management: Waste Act, 2008, applications for development rights in terms of the Spatial Planning and Land Use

Legislation	Description of Legislation and applicability
	Management Act, 2013 and requests for the de-proclamation, or the withdrawal of declarations, of protected areas in terms of provincial legislation or NEMPAA. Biodiversity is fundamental to the health and well-being of people, as well as economic activity and socio-economic upliftment. The National Biodiversity Assessment (2018) (NBA 2018) states that South Africa's biodiversity assets and ecological infrastructure contribute significantly towards meeting national development priorities. Biodiversity offsetting, if done correctly, can advance the environmental right in the Constitution of the Republic of South Africa, 1996 (Constitution). Section 24 of the Constitution provides that everyone has the right to, amongst other things, have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that, amongst other things, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. Biodiversity offsetting is one of the ways in which South Africa's protected and conservation areas can be expanded, thereby promoting conservation. It may well also help to secure ecologically sustainable development as it mitigates the adverse impact of economic and social development on biodiversity, which, in turn, underpins such development. The biodiversity offsetting process, which only applies when a biodiversity offset is required involves the following steps: • Identifying the need for a biodiversity offset. • Determining the requirements of a biodiversity offset and compilation of a Biodiversity Offset Report. • Selecting a biodiversity offset site. • Securing the biodiversity offset site. • Preparing a Biodiversity Offset Management Plan. • Preparing biodiversity offset conditions for an EA. • Concluding a Biodiversity Offset Implementation Agreement. "The requirement for a biodiversity offset will be confirmed during the EIA phase. Should it be required, the Biodiversity offset Strategy will be included in the Draft EIAr.
National Environmental Management Protected Areas Act (No. 57 of 2003)	The purpose of the National Environmental Management Protected Areas Act (No. 57 of 2003) (NEMPAA) is to, inter alia, provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. To this end, it provides for the declaration and management of various types of protected areas. Section 50(5) of NEMPAA states that "no development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority." There are no protected areas within the study area. A significant portion of the development footprint coincides with areas that have been identified as Priority Focus Areas as part of the National Protected Area Expansion Strategy (2018) (NPAES), which is aligned with the FSBSP CBAs and ESAs. It must be noted that the NPAES are focus areas for the future expansion of protected are and are not gazetted protected areas in terms of Section 50 of the NEMPAA..
National Forest Act (No. 84 of 1998)	The National Forests Act (No 84 of 1998) (NFA) was promulgated to reform the law on forests,

Legislation	Description of Legislation and applicability
	The NFA regulates the protection of certain forests and trees. The NFA provides that a licence or exemption must be obtained in order to: ■ cut, disturb, damage or destroy (i) any indigenous tree in a natural forest; or (ii) any protected tree; or ■ possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any tree, or any forest product derived from (i) an indigenous tree in a natural forest; or (ii) a protected tree.
The National Water Act (No. 36 of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water that the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under certain thresholds or meet certain criteria. The list of water uses applicable to the proposed Project include: • Taking water from a water resource; • Impeding or diverting the flow of water in a watercourse; • Disposing of waste in a manner which may detrimentally impact on a water resource; • Altering the bed, banks, course or characteristics of a watercourse; The DWS will make the final decision on water uses that are applicable to the project through a pre-application meeting after which a Water Use Authorisation Application (WULA) as determined by the risk assessment will be undertaken in compliance with procedural regulations published by the DWS within General Notice 267 (GN267). These regulations specify required information per water use and the reporting structure of required supporting technical information.
Water Services Act (No. 108 of 1997)	The Water Services Act (No. 108 of 1997) (WSA) regulates the supply of water services by water services authorities and water services providers. According to section 6 of the WSA, no person may use water supply and sanitation services from a source other than a water services provider nominated by the water services authority (such as a municipality) having jurisdiction in the area in question, without the approval of that water services authority. The definition of “water services” in the WSA includes “water supply services” and “sanitation services” If it is indented that the Project will receive water from a municipal system then the Water Services Act may be triggered, i.e. if the project will require water for construction and or later operational purposes other than from a bore hole, say from the municipality, then the Municipality will have to provide a confirmation letter to this effect. Please include reference to the WSA..
The National Heritage	The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides

Legislation	Description of Legislation and applicability

Resources Act (No. 25 of 1999)	for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA), and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development.
	
	Part 2 of the NHRA details specific activities that require a Heritage Impact Assessment (HIA) that will need to be approved by SAHRA. Parts of Section 35, 36 and 38 apply to the proposed project, principally:
	
	• Section 35 (4) - No person may, without a permit issued by the responsible heritage resources authority-
	  • destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
	  • destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite.
	
	• Section 38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-
	  • any development or other activity which will change the character of a site— (i) exceeding 5 000 m2 in extent, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.
	
	In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the proposed Groothoek WEF, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668).
	
	A desktop Heritage Scoping Report (**Appendix G.10**) has been carried out by a suitably qualified specialist, revealing:
	
	• Heritage resources in the study area consist of structures and ruins older than 60 years, burial sites;
	• The larger region around Verkykerskop is characterised by Later Iron Age stone walled sites likely an indicator of Batlokwa and Basia occupation;
	• The study area is indicated to be of low, moderate, and very high paleontological sensitivity according to SAHRIS, and additional studies are required for the EIA phase;
	• To comply with the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and with cognisance of known heritage resources in the area, the development footprint should be subjected to a field-based Heritage Impact Assessment (HIA) of the final impact areas..
	
	The proposed project will be loaded onto the SAHRIS portal for comment by the SAHRA.

Legislation	Description of Legislation and applicability
Mineral and Petroleum Resources Development Act (No. 28 of 2002)	The aim of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) is to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. Section 53(1) of the MPRDA provides that any person who intends to use the surface of any land in any way that may be contrary to any object of the MPRDA, or which is likely to impede any such object, must apply to the Minister of Mineral Resources (the Minister) for approval. Section 53 of the MPRDA provides a mechanism for ensuring that, inter alia, the mining of mineral resources is not detrimentally affected through the use of the surface of land and which may, for example, result in the sterilisation of a mineral resource. The Amendment Regulations (GNR 420 of 27 March 2020) introduced a template for section 53 applications (Form Z) and the specific information that applicants will need to provide as part of a section 53 application.
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	In South Africa, environmental noise control has been in place for three decades, beginning in the 1980s with codes of practice issued by the South African National Standards (formerly the South African Bureau of Standards, SABS) to address noise pollution in various sectors of the country. Under the previous generation of environmental legislation, specifically the Environmental Conservation Act 73 of 1989 (ECA), provisions were made to control noise from a National level in the form of the Noise Control Regulations (GNR 154 of January 1992). In later years, the ECA was replaced by the National Environmental Management Act 107 of 1998 (NEMA) as amended. The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) was published in line with NEMA and contains noise control provisions under Section 34: 1) The minister may prescribe essential national standards – a) for the control of noise, either in general or by specific machinery or activities or in specified places or areas; or b) for determining – i. a definition of noise; and ii. the maximum levels of noise. 2) When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards. Under NEMAQA, the Noise Control Regulations were updated and are to be applied to all provinces in South Africa. The Noise Control Regulations give all the responsibilities of enforcement to the Local Provincial Authority, where location specific by-laws can be created and applied to the locations with approval of Provincial Government. Where province-specific regulations have not been promulgated, acoustic impact assessments must follow the Noise Control Regulations. Furthermore, NEMAQA prescribes that the Minister must publish maximum allowable noise levels for different districts and national noise standards. These have not yet been accomplished and as a result all monitoring and assessments are done in accordance with the South African National Standards (SANS) 10103:2008 and 10328:2008.
Conservation of Agricultural	The Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) provides for the implementation of control measures for soil conservation works as well as alien and invasive plant species in and outside of urban areas.

Legislation	Description of Legislation and applicability
Resources Act (No. 43 of 1983)	In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties. Various Acts administered by the DFFE and the DWS, as well as other laws (including local by-laws), spell out the fines, terms of imprisonment and other penalties for contravening the law. Although no fines have yet been placed against landowners who do not remove invasive species, the authorities may clear their land of invasive alien plants and other alien species entirely at the landowners' cost and risk. The CARA Regulations with regards to alien and invasive species have been superseded by NEMBA Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014. Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act (Act 43 of 1983 - 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 construction of infrastructure does not constitute cultivation as it is understood in CARA. This has been corroborated by Anneliza Collett (Acting Scientific Manager: Natural Resources Inventories and Assessments in the Directorate: Land and Soil Management of the Department of Agriculture, Land Reform and Rural Development (DALRRD)). The construction and operation of the facility will therefore not require consent from the Department of Agriculture, Land Reform and Rural Development in terms of this provision of CARA.
Civil Aviation Act (No. 13 of 2009)	Civil aviation in South Africa is governed by the Civil Aviation Act (Act 13 of 2009). This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by South African Civil Aviation Authority (SACAA) as an agency of the Department of Transport (DoT). SACAA achieves the objectives set out in the Act by complying with the Standards and Recommended Practices (SARPs) of the International Civil Aviation Organisation (ICAO), while considering the local context when issuing the South African Civil Aviation Regulations (SA CARs). As of the 1st of May 2021, Air Traffic and Navigation Services (ATNS) has been appointed as the new Obstacle application Service Provider for Windfarms and later Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Windfarms and in due time Power Plant assessments. The DFFE Screening Tool Report identified Civil Aviation as having Low- sensitivity for the proposed WEF. An Application for the Approval of Obstacles will also be submitted to ATNS. SACAA will be included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought from these authorities as applicable.
Occupational Health and Safety Act (No. 85 of 1993)	The National Occupational Health and Safety Act (No. 85 of 1993) (OHSA) and the relevant regulations under the Act are applicable to the proposed project. This includes the Construction Regulations promulgated in 2014 under Section 43 of the Act. Adherence to South Africa's OHSA and its relevant Regulations is essential.
National Energy Act (No. 34 of 2008)	The National Energy Act aims to ensure that diverse energy resources are available, in sustainable quantitates, and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account

Legislation	Description of Legislation and applicability
	environmental management requirements and interactions amongst economic sectors. The main objectives of the Act are to: • Ensure uninterrupted supply of energy to the Republic; • Promote diversity of supply of energy and its sources; • Facilitate effective management of energy demand and its conservation; • Promote energy research; • Promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy; • Ensure collection of data and information relating to energy supply, transportation and demand; • Provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development; • Provide for certain safety, health and environment matters that pertain to energy; • Facilitate energy access for improvement of the quality of life of the people of Republic; • Commercialise energy-related technologies; • Ensure effective planning for energy supply, transportation, and consumption; and • Contribute to sustainable development of South Africa's economy. In terms of the act, the Minister of Energy is mandated to develop and, on an annual basis, review and publish the Integrated Energy Plan (IEP) in the Government Gazette. The IEP analyses current energy consumption trends within different sectors of the economy (i.e. agriculture, commerce, industry, residential and transport) and uses this to project future energy requirements, based on different scenarios. The IEP and the Integrated Resource Plan are intended to be updated periodically to remain relevant. The framework is intended to create a balance between energy demand and resource availability so as to provide low-cost electricity for social and economic development, while taking into account health, safety and environmental parameters.
Electricity Regulation Act (No. 4 of 2006)	The Electricity Regulation Act (No. 4 of 2006) (ERA) aims to: Achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa; Ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency. effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic: • Facilitate investment in the electricity supply industry; • Facilitate universal access to electricity; • Promote the use of diverse energy sources and energy efficiency; • Promote competitiveness and customer and end user choice; and • Facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public. The Act establishes a National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated.

Legislation	Description of Legislation and applicability
Environment Conservation Act No 73 of 1989	The Environment Conservation Act (No 73 of 1989) (ECA) requires that any person who constructs works for the supply of light, heat or power by means of electricity, must notify electronic communications network service licensees of the proposed works; provide such licensees with a plan of the proposed works and any further information that may be required; and comply with any requirements imposed by such licensees. Section 29(1)(b) of the ECA provides that electronic communications network service licensees (e.g.; Vodacom, MTN, ICASA…) must be notified at least 30 days prior to commencement of construction.

5.2 POLICIES AND PLANS

Table 5-2 summarised key policies and plans as an outline of the governance framework for the project.

Table 5-2: Applicable Regional Policies and Plans

Applicable Policy	Description of Policy
National Development Plan	The National Development Plan aims to eliminate poverty and reduce inequality by 2030. The NDP identifies several enabling milestones. Of relevance to the proposed development the NDP refers to the need to produce sufficient energy to support industry at competitive prices and ensure access for poor households, while reducing carbon emissions per unit of power by about one-third. In this regard the infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development. Chapter 3, Economy, and Employment, identifies some of the structural challenges specific to South Africa, including an energy constraint that will act as a cap on growth and on options for industrialisation. The NDP notes that from an environmental perspective South Africa faces several related challenges. The reduction of greenhouse gas emissions and shift to a green low-carbon economy, is one of these challenges. In terms of implementation the NDP identifies three phases. The first two are of specific relevance to the proposed project. The first phase (2012–2017) notes that ensuring the supply of energy and water is reliable and sufficient for a growing economy. The second phase (2018–2023) involves building on the first phase to lay the foundations for more intensive improvements in productivity. The provision of affordable and reliable energy is a key requirement for this to take place. Chapter 4, Economic infrastructure, notes that economic infrastructure provides the foundation for social and economic development. In this regard South Africa must invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives. The plan envisages that, by 2030, South Africa will have an energy sector that promotes: • Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient

Applicable Policy	Description of Policy
	energy service at competitive rates, while supporting economic growth through job creation. • Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. More specifically, South Africa should have adequate supply security in electricity and in liquid fuels, such that economic activity, transport, and welfare are not disrupted. • The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation. In this regard coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources, will play a much larger role.
Integrated Resource Plan 2010 – 2030	The IRP is an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost. On 6 May 2011, the then Department of Energy (DoE) released the Integrated Resource Plan 2010-2030 (IRP 2010) in respect of South Africa's forecast energy demand for the 20-year period from 2010 to 2030. The promulgated IRP 2010–2030 identified the preferred generation technology required to meet expected demand growth up to 2030. It incorporated government objectives such as affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversified electricity generation sources, localisation and regional development. The IRP recognises that Solar photovoltaic (PV), wind and concentrated solar power (CSP) with storage present an opportunity to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Renewable technologies also present huge potential for the creation of new industries, job creation and localisation across the value chain.
New Growth Path	Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: energy, transport, communication, water, and housing.
National Infrastructure Plan	The South African Government adopted a National Infrastructure Plan (NIP) in 2012. The NIP aims to transform the South African economic landscape while simultaneously creating significant numbers of new jobs and strengthening the delivery of basic services. It outlines the challenges and enablers which needs to be addressed in the building and developing of infrastructure. The Presidential Infrastructure Coordinating Commission (PICC) was established by the Cabinet to integrate and coordinate the long-term infrastructure build. The plan also supports the integration of African economies. In terms of the plan Government will invest R827 billion over the next three years to build new and upgrade existing infrastructure. The aim of the investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in

Applicable Policy	Description of Policy
	the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to improved economic growth.
Integrated Energy Plan	The development of a National IEP was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and, in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and, on an annual basis, review and publish the IEP in the Government Gazette. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development. The IEP notes that South Africa needs to grow its energy supply to support economic expansion and in so doing, alleviate supply bottlenecks and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process, eight key objectives are identified, namely: • Objective 1: Ensure security of supply. • Objective 2: Minimise the cost of energy. • Objective 3: Promote the creation of jobs and localisation. • Objective 4: Minimise negative environmental impacts from the energy sector. • Objective 5: Promote the conservation of water. • Objective 6: Diversify supply sources and primary sources of energy. • Objective 7: Promote energy efficiency in the economy. • Objective 8: Increase access to modern energy. The IEP provides an assessment of current energy consumption trends within different sectors of the economy (i.e., agriculture, commerce, industry, residential and transport) and uses this information to identify future energy requirements, based on different scenarios. The scenarios are informed by different assumptions on economic development and the structure of the economy and consider the impact of key policies such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others. Based on this information the IEP then determines the optimal mix of energy sources and technologies to meet those energy needs in the most cost-effective manner for each of the scenarios. The associated environmental impacts, socio-economic benefits and macroeconomic impacts are also analysed. The IEP is therefore focused on determining the long-term energy pathway for South Africa, considering a multitude of factors which are embedded in the eight objectives. As part of the analysis four key scenarios were developed, namely the Base Case, Environmental Awareness, Resource Constrained and Green Shoots scenarios: The Base Case Scenario assumes that existing policies are implemented and will continue to shape the energy sector landscape going forward. It assumes moderate economic growth in the medium to long term. The Environmental Awareness Scenario is characterised by more stringent emission limits and a more environmentally aware society, where a higher cost is placed on externalities caused by the supply of energy.

Applicable Policy	Description of Policy
	The Resource Constrained Scenario in which global energy commodity prices (i.e. coal, crude oil and natural gas) are high due to limited supply. The Green Shoots Scenario describes an economy in which the targets for high economic growth and structural changes to the economy, as set out in the National Development Plan (NDP), are met. The IEP notes that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources. In terms of existing electricity generation capacity, the IEP indicates that existing capacity starts to decline notably from 2025, with significant plant retirement occurring in 2031, 2041 and 2048. By 2050 only 20% of the current electricity generation capacity remains. As a result, large investments are required in the electricity sector in order to maintain an adequate supply in support of economic growth. By 2020, various import options become available, and some new coal capacity is added along with new wind, solar and gas capacity. The mix of generation capacity technologies by 2050 is considerably more diverse than the current energy mix, across all scenarios. The main differentiating factors between the scenarios are the level of demand, constraints on emission limits and the carbon dioxide externality costs. In all scenarios the energy mix for electricity generation becomes more diverse over the period to 2050, with coal reducing its share from about 85% in 2015 to 15–20% in 2050 (depending on the scenario). Solar, wind, nuclear, gas and electricity imports increase their share. The Environmental Awareness and Green Shoots scenarios take on higher levels of renewable energy. An assessment of each scenario against the eight objectives with reference to renewable energy notes while all scenarios seek to ensure that costs are minimised within the constraints and parameters of each scenario, the Base Case Scenario presents the least cost followed by the Environmental Awareness, Resource Constrained and Green Shoots scenarios respectively when total energy system costs are considered. In terms of promoting job creation and localisation potential the Base Case Scenario presents the greatest job creation potential, followed by the Resource Constrained, Environmental Awareness and Green Shoots scenarios respectively. In all scenarios, approximately 85% of total jobs are localisable. For electricity generation, most jobs result from solar technologies followed by nuclear and wind, with natural gas and coal making a smaller contribution. The Environmental Awareness Scenario, due to its stringent emission constraints, shows the lowest level of total emissions over the planning horizon. This is followed by the Green Shoots, Resource Constrained and Base Case scenarios. These trends are similar when emissions are considered cumulatively and individually by type.
National Protected Area Expansion Strategy, 2018	The National Protected Area Expansion Strategy 2018 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different

Applicable Policy	Description of Policy
	priority sites based on local requirements, constraints and opportunities (NPAES, 2018). According to the screening tool, there are areas within the study area that have been identified as priority areas for inclusion in future protected areas. According to the NPAES (2018), large portions of habitat in the study area have been mapped as Priority Focus Areas for protected area expansion.
Multi-species Biodiversity Management Plan for Vultures in South Africa	The Multi-species Biodiversity Management Plan for Vultures in South Africa aims to implement comprehensive strategic conservation actions that cover the geographic ranges of all nine vulture species found in South Africa, with a particular focus on the seven resident breeding species. The plan also aims to strengthen concerted, collaborative, and coordinated international efforts to recover these populations to acceptable levels by 2033. The BMP is published at an opportune time after the publication of the White Paper on Conservation and Sustainable Use of South Africa's Biodiversity. The BMP is aligned with the goals and enablers of the White Paper. As explicitly recognised that the responsibility rests with a range of stakeholders, including, but not limited to, the State, traditional leaders, traditional health practitioners, communities, private landowners, industry, academia, non-government organisations and civil society, this BMP provides the platform to showcase and uphold what is contained in the White Paper. It is a clear demonstration of how stakeholders involved with vulture conservation are working together to ensure that all South Africans will continue to benefit from the ecosystem services provided by vultures. In terms of section 43(2) and 43(3)(c) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), the Minister has assigned the responsibility for implementation of the Multi-species Biodiversity Management Plan for Vultures in South Africa to the National Vulture Task Force.

5.3 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK

Table 5-3 summarised key provincial and municipal plans as an outline of the governance framework for the project.

Table 5-3: Provincial and Municipal Plans

Applicable Plan	Description of Plan
Phumelela Local Municipality Integrated Development Plan 2022-27 (MIDP).	The plan serves as a strategic plan document for the municipality. It details the municipality's short-term and long-term objectives and strategies aligned with the Provincial and National Development Plan.
Phumelela Local Municipality Spatial Development Framework.	The PSDF is a required tool to address historically distorted, unviable, and unsustainable spatial patterns and challenges caused by apartheid planning.
Provincial Biodiversity Permits	The project will be required to obtain Provincial Biodiversity Permits relating to activities relating to: ▪ carry out a restricted activity involving a specimen of a listed threatened or protected species; and ▪ carry out a restricted activity in relation to a specimen or an alien species or listed invasive species. A "restricted activity" is defined very broadly in NEMBA and almost any action in respect of a listed threatened or protected species or in respect of an alien species or listed invasive species would require a permit prior to undertaking that activity. Permits may be required in terms of the Nature Conservation Amendment Ordinance, No. 5 of 1986.
Free State Biodiversity Plan 2024	The FSBP was approved and adopted by the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs on 14 October 2024. The biodiversity plan was developed with cognisance of the requirements for the determination of bioregions and the preparation and publication of bioregional plans (DEAT, 2009). To this extent the two main products of the biodiversity planning process are: ▪ A map indicating the different terrestrial categories (Protected, Critical Biodiversity Areas, Ecological Support Areas, Other and Degraded) ▪ Land-use guidelines for the above-mentioned categories This plan represents the first attempt at collating all terrestrial biodiversity and ecological data into a single system from which it can be interrogated and assessed. Biodiversity and ecological data consulted and included are: • Land cover data • Inselbergs • Species distribution data (from records and expert mapping) • Modelled species distribution • A range of national data sets (Vegetation types, NFEPA sub- • catchments, species distribution data, etc.) • The existing Ekangala spatial biodiversity plan

Applicable Plan	Description of Plan
	• Biodiversity plans of neighbouring provinces • Existing provincial plans that guide development within the Free • State Province, most notably the Provincial Spatial Development Framework (PSDF) • Administrative data

5.4 INTERNATIONAL ENVIRONMENTAL AND SOCIAL STANDARDS

5.4.1 IFC PERFORMANCE STANDARDS

The IFC Performance Standards (PS) are internationally recognized guidelines for managing environmental and social risks. While this EIA focuses on meeting South African regulatory requirements under NEMA, the IFC PS are acknowledged as part of the project's future commitments to international standards, particularly for financial close.

At this stage, the EIA process is not designed to fully comply with IFC Performance Standards (PS), as these standards extend beyond what is required under South African regulations. However, the process includes specialist studies, such as social impact assessments, biodiversity assessments, and stakeholder consultations, which provide a foundation for future alignment with international standards.

Compliance with IFC PS will be addressed during later stages of the project lifecycle, should the project proceed, through the development of detailed action plans and a comprehensive Environmental and Social Management System (ESMS).

The table below provides a high-level acknowledgment of how each Performance Standard relates to the Groothoek Wind Energy Facility (WEF) and highlights the gaps to be addressed during subsequent project phases.

5.4.2 WORLD BANK GROUP ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES

The World Bank Group (WBG) Environmental Health and Safety (EHS) Guidelines are technical reference documents that provide guidance on managing environmental, health, and safety risks. These guidelines are relevant for international financing requirements but are not mandatory for compliance with South African EIA regulations under NEMA.

While the EHS Guidelines have not been applied during the EIA process, they provide a valuable framework for identifying and mitigating risks. Should the project progress to the financing stage, the guidelines will be reviewed and applied, along with the IFC Performance Standards, to ensure alignment with international standards.

Future alignment with the Wind Energy Guidelines (2015) and General EHS Guidelines will address key issues such as:

- Biodiversity impacts (e.g., effects on birds and bats).
- Noise, shadow flicker, and visual impacts during construction and operation.

- Community health and safety, including transportation risks.

These guidelines will be incorporated into detailed planning and mitigation measures at a later stage, as part of the project's commitment to international best practices.

5.4.3 EQUATOR PRINCIPLES

The Equator Principles (EPs) provide a globally recognized framework for assessing and managing environmental and social risks in projects. They establish a minimum standard for due diligence and promote alignment with responsible environmental and social practices. While typically adopted by financial institutions for projects seeking international funding, the EPs are also used to guide internal standards for companies aiming to align with global best practices.

For the Groothoek WEF project, compliance with the EPs is not a requirement during the Environmental Impact Assessment (EIA) process under South African regulations. However, alignment with the EPs will be required before financial close to meet the internal standards set by Copenhagen Infrastructure Partners (CIP), as the majority shareholder in Mulilo.

Instead of conducting a full Environmental and Social Impact Assessment (ESIA), any gaps identified during the EIA process will be addressed through additional specialist studies. These studies will focus on enhancing compliance with EP standards and ensuring the project meets the requirements for financial institutions that adopt the EP framework. This approach ensures a balance between meeting South African EIA regulatory requirements and the more extensive international standards required by the EPs.

The principles emphasize areas such as stakeholder engagement, grievance mechanisms, independent monitoring, and adherence to host country laws while addressing any additional requirements under the IFC Performance Standards or World Bank Group Environmental, Health, and Safety Guidelines for non-designated countries like South Africa.

By addressing the identified gaps and incorporating EP-aligned processes before financial close, the project will ensure robust environmental and social governance throughout its lifecycle.

The requirements and applicability of the EPs are outlined in **Table 5-5**.

Table 5-4 - Requirements and Applicability of the Equator Principles

Requirement		Project Specific Applicability
Principle 1: Review and Categorisation		
Overview	When a project is proposed for financing, the EPFI will, as part of its internal social and environmental review and due diligence, categorise such project based on the magnitude of its potential impacts and risks in accordance with the environmental and social screening criteria of the IFC. Using categorisation, the EPFI's environmental and social due diligence is	Based upon the significance and scale of the Project's environmental and social impacts, the proposed project is regarded as a Category B project i.e., a project with potential limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.

Requirement		Project Specific Applicability
	commensurate with the nature, scale, and stage of the Project, and with the level of environmental and social risks and impacts. The categories are: • Category A: Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented; • Category B: Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and • Category C: Projects with minimal or no adverse environmental and social risks and/or impacts.	
Principle 2: Environmental and Social Assessment		
Overview	For all Category A and Category B Projects, the EPFI will require the client to conduct an appropriate Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and scale of impacts of the proposed Project (which may include the illustrative list of issues found in Exhibit II). The Assessment Documentation should propose measures to minimise, mitigate, and where residual impacts remain, to compensate/ offset/ remedy for risks and impacts to Workers, Affected Communities, and the environment, in a manner relevant and appropriate to the nature and scale of the proposed Project The Assessment Documentation will be an adequate, accurate and objective evaluation and presentation of the environmental and social risks and impacts, whether prepared by the client, consultants or external experts. For Category A, and as appropriate, Category B Projects, the Assessment Documentation includes an Environmental and Social Impact Assessment (ESIA). One or more specialised studies may also need to be undertaken. For other Category B and potentially C Projects, a limited or focused environmental or social assessment may be appropriate, applying applicable risk management standards relevant to the risks or impacts identified during the categorisation process. The client is expected to include assessments of potential adverse Human Rights impacts	This document is the second deliverable (i.e., Final Scoping Report) from the S&EIR process undertaken for the proposed Project. The impact assessment will be undertaken during the next phase of the S&EIR process. The assessment will comprehensively assess the key environmental and social impacts and complies with the requirements of the South African EIA Regulations. In addition, an EMPr will also be compiled.

Requirement		Project Specific Applicability
	and climate change risks as part of the ESIA or other Assessment, with these included in the Assessment Documentation.	
Principle 3: Applicable Environmental and Social Standards		
Overview	The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues. The EPFI's due diligence will include, for all Category A and Category B Projects globally, review and confirmation by the EPFI of how the Project and transaction meet each of the Principles. For Projects located in Non-Designated Countries, the Assessment process evaluates compliance with the then applicable IFC PS and WBG EHS Guidelines. For Projects located in Designated Countries, compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues.	As South Africa has been identified as a non-designated country, the reference framework for environmental and social assessment is based on the IFC PS. In addition, this S&EIR process has been undertaken in accordance with NEMA (the host country's relevant legislation).
Principle 4: Environmental and Social Management System and Equator Principles Action Plan		
Overview	For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards. Where the applicable standards are not met to the EPFI's satisfaction, the client and the EPFI will agree on an Equator Principles Action Plan (EPAP). The EPAP is intended to outline gaps and commitments to meet EPFI requirements in line with the applicable standards.	A formal project specific ESMS will be compiled in the event that the project is developed in the future. Management and monitoring plans outlined in the EMPr will serve as the basis for an ESMS for the proposed Project.
Principle 5: Stakeholder Engagement		
Overview	EPFI will require the client to demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with Affected Communities Workers and, where relevant, Other Stakeholders. For Projects with potentially significant adverse impacts on Affected Communities, the client will conduct	The S&EIR process includes an extensive stakeholder engagement process which complies with the South African EIA Regulations. The process includes consultations with local communities, nearby businesses, and a range of government sector stakeholders (state owned enterprises, national, provincial and local departments).

Requirement		Project Specific Applicability
	an Informed Consultation and Participation process. To accomplish this, the appropriate assessment documentation, or non-technical summaries thereof, will be made available to the public by the borrower for a reasonable minimum period in the relevant local language and in a culturally appropriate manner. The borrower will take account of and document the process and results of the consultation, including any actions agreed resulting from the consultation. Disclosure of environmental or social risks and adverse impacts should occur early in the Assessment process, in any event before the Project construction commences, and on an ongoing basis. All Projects affecting Indigenous Peoples will be subject to a process of Informed Consultation and Participation, and will need to comply with the rights and protections for Indigenous Peoples contained in relevant national law, including those laws implementing host country obligations under international law.	The stakeholder engagement process solicits interest from potentially interested parties through the placement of site notices and newspaper advertisements as well as written and telephonic communication. The stakeholder engagement process is detailed in Section 4.6. A further Stakeholder Engagement Plan will be developed and implemented as part of the ESMS (post-EIA phase) for the construction and operational phases of the project.
Principle 6: Grievance Mechanism		
Overview	For all Category A and, as appropriate, Category B Projects, the EPFI will require the client, as part of the ESMS, to establish effective grievance mechanisms which are designed for use by Affected Communities and Workers, as appropriate, to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance. The borrower will inform the Affected Communities and Workers about the grievance mechanism in the course of the stakeholder engagement process and ensure that the mechanism addresses concerns promptly and transparently, in a culturally appropriate manner, and is readily accessible, at no cost, and without retribution to the party that originates the issue or concern.	The EMPr will include a Grievance Mechanism Process for Public Complaints and Issues. This procedure effectively allows for external communications with members of the public to be undertaken in a transparent and structured manner. A Grievance Mechanism will be developed and implemented as part of the ESMS (post-EIA phase) for the construction and operational phases of the project.
Principle 7: Independent Review		
Overview	For all Category A and, as appropriate, Category B Projects, an Independent Environmental and Social Consultant, not directly associated with the client, will carry	This principle will only become applicable in the event that that the project is developed in the future.

Requirement		Project Specific Applicability
	out an Independent Review of the Assessment Documentation including the ESMPs, the ESMS, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence, and assess Equator Principles compliance.	
Principle 9: Independent Monitoring and Reporting		
Overview	To assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting for all Category A, and as appropriate, Category B projects. Monitoring and reporting should be provided by an Independent Environmental and Social Consultant; alternatively, the EPFI will require that the client retain qualified and experienced external experts to verify its monitoring information, which will be shared with the EPFI in accordance with the frequency required.	This principle will only become applicable in the event that the project is developed in the future.

5.4.4 GENERIC EMPR RELEVANT TO AN APPLICATION FOR SUBSTATION AND OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

NEMA requires that an EMPr be submitted where an EIA has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation. The content of an EMPr must either contain the information set out in Appendix 4 of the EIA Regulations, 2014, as amended, or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice, that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the CA.

GN 435 of 22 March 2019 identified a generic EMPr relevant to applications for substations and overhead electricity transmission and distribution infrastructure which require authorisation in terms of Section 42(2) of NEMA. Applications for overhead electricity transmission and distribution infrastructure that trigger Activity 11 of Listing Notice 1 or Activity 9 of Listing Notice 2 and any other listed or specified activities must use the generic EMPr.

The objective of the generic EMPr is “to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.”

The generic EMPrs for Substations and powerlines will be included in the Site-Specific EMPr during the EIA phase.

5.4.5 ADDITIONAL PERMITS AND AUTHORISATIONS

Table 5-5 outlines the additional permits and authorisations required for the proposed development, as well as the relevant Competent Authorities responsible.

Table 5-5 – Additional Permits and Authorisations required for the proposed development

Permits/Authorisation	Legislation	Relevant Authority	Status
Water Use Licence / General Authorisation	National Water Act (Act No. 36 of 1998)	Department of Water and Sanitation	In Progress
Notification Of Intent To Develop (NID) Section 38 (1) and Section 38 (8)	National Heritage Resource Act (Act No. 25 of 1999)	South African Heritage Resources Authority (SAHRA)	In Progress
Obstacle Permit	Civil Aviation Act (Act 13 of 2009)	Air Traffic and Navigation Services / Civil Aviation Authority	Conditional Approval will be required for the facility prior to construction.

6 BASELINE ENVIRONMENT

The following chapter presents an overview of the biophysical and socio-economic environment in which the proposed Project is located. It is important to gain an understanding of the Project area and its surroundings, as it will provide for a better understanding of the receiving environment in which the Project is being considered.

The description of the baseline environment is essential in that it represents the conditions of the environment before the construction of the proposed Project (i.e. the current, or status quo, environment) against which environmental impacts of the proposed Project can be assessed and future changes monitored.

The area has previously been studied to some extent and is recorded in various sources. Consequently, some components of the baseline have been generated based on literature review. However, where appropriate, baseline information has been supplemented or generated by specialists appointed to undertake baseline and impact assessments for the proposed Project.

6.1 PHYSICAL ENVIRONMENT

6.1.1 SOIL, LANDUSE AND LAND CAPABILITY

The following is extracted from the Agricultural Agro-Ecosystem Specialist Assessment by Johann Lanz and included as Appendix G.4.

All the important parameters that control the agricultural production potential of the site are given in **Table 6-1**. The land type soil data are given in **Appendix 5** of the specialist report. A satellite image map of the development site is given in **Figure 6-1**.

The site falls outside of an area that is classified as a Protected Agricultural Area (PAA) (DALRRD, 2020). A PAA is a demarcated area in which the climate, terrain, and soil are generally conducive for agricultural production and which, historically, has made important contributions to the production of the various crops that are grown across South Africa. Within PAAs, the protection, particularly of arable land, is considered a priority for the protection of food security in South Africa, but the protection of land outside of these areas is generally not considered a food security priority.

Table 6-1 - Parameters that control and/or describe the agricultural production potential of the site.

	Parameter	Value
Climate	Köppen-Geiger climate description (Beck et al, 2018)	Temperate, dry winter, warm summer
	Mean Annual Rainfall (mm) (Schulze, 2009)	618 to 936
	Reference Crop Evaporation Annual Total (mm) (Schulze, 2009)	12500 to 1320
	Climate capability classification (out of 9) (DAFF, 2017)	Predominantly 6 (moderate-high)
Terrain	Terrain type	Hilly with Rocky plateaus and high variation in elevation

	Parameter	Value
	Terrain morphological unit	Varied
	Slope gradients (%)	0 to 47
	Altitude (m)	1950
	Terrain capability classification (out of 9) (DAFF, 2017)	3 (low) to 7 (high)
Soil	Geology (DAFF, 2002)	Beaufort mudstone, shale, and sandstone with occasional dolerite sills and narrow dolerite dykes.
	Land type (DAFF, 2002)	Bb28, Bd29, Ca18
	Description of the soils	Very shallow to deep, medium textured soils on underlying rock or clay.
	Dominant soil forms	Mispah, Glenrosa, Avalon, Pinedene, Clovelly
	Soil capability classification (out of 9) (DAFF, 2017)	3 (low) to 6 (moderate-high)
	Soil limitations	Predominantly soil depth and rockiness
Land use	Agricultural land use in the surrounding area	Croplands and grazing
	Agricultural land use on the site	Croplands and grazing
General	Long-term grazing capacity (ha/LSU) (DAFF, 2018)	5
	Land capability classification (out of 15) (DAFF, 2017)	3 (low-very low) to 10 (moderate-high)
	Within Protected Agricultural Area (DALRRD, 2020)	No
	Within Renewable Energy Development Zone (REDZ)	No

The agricultural protocol requires the current productivity of the land based on detailed production figures and it requires the current employment figures. This detail is entirely irrelevant to the assessment of the agricultural impact, given that the expected losses in production and employment will be zero (see **Section 9.1** of the specialist report). It is therefore unnecessary to include this detail.

There are no existing impacts on the site that are relevant to agricultural impact.

6.1.1.1 Assessment of the agricultural production potential

The site is fairly mountainous and much of the land across the site has insufficient capability for viable crop production due to terrain and soil limitations (predominantly limited depth and rockiness). There are patches of land that are suitable for viable cropping. The crop-suitable versus unsuitable soils have been identified over time through trial and error. All the sufficiently deep, suitable soils are generally cropped, and uncropped soils that are used for grazing can fairly reliably be considered to have various limitations that make them unsuitable for crop production.

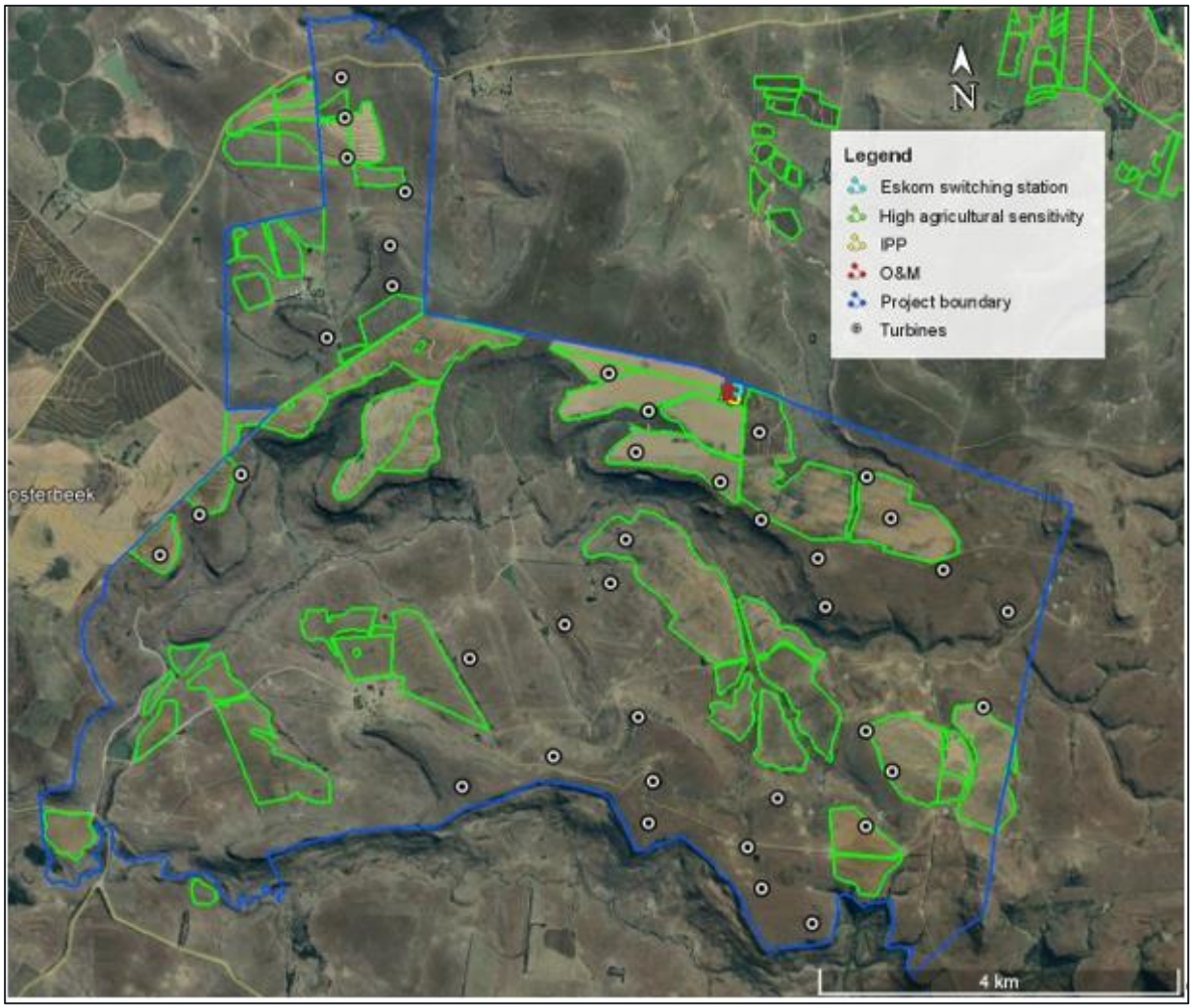

Figure 6-1 - Satellite image map of the assessed development

6.1.2 GEOLOGICAL CONTEXT

The following is extracted from the Geotechnical Scoping report by WSP Group Africa (Pty) Ltd and included as Appendix G.1.

According to the published 1: 250 000 geological maps (Sheet 2728 Frankfort and 2828 Harrismith), the study area is underlain by rocks of the Adelaide and Tarkastad Subgroup, Beaufort Group of the Karoo Supergroup. The Adelaide and Tarkastad Subgroups have been extensively intruded by Jurassic age dolerite (Jd). Minor areas of recent surficial deposits, alluvium, blanket areas along Dwaalspruit River at the southern border of the site.

An excerpt of the published geological map showing the project area is presented as **Figure 6-2** and the lithostratigraphy is presented as **Table 6-2**.

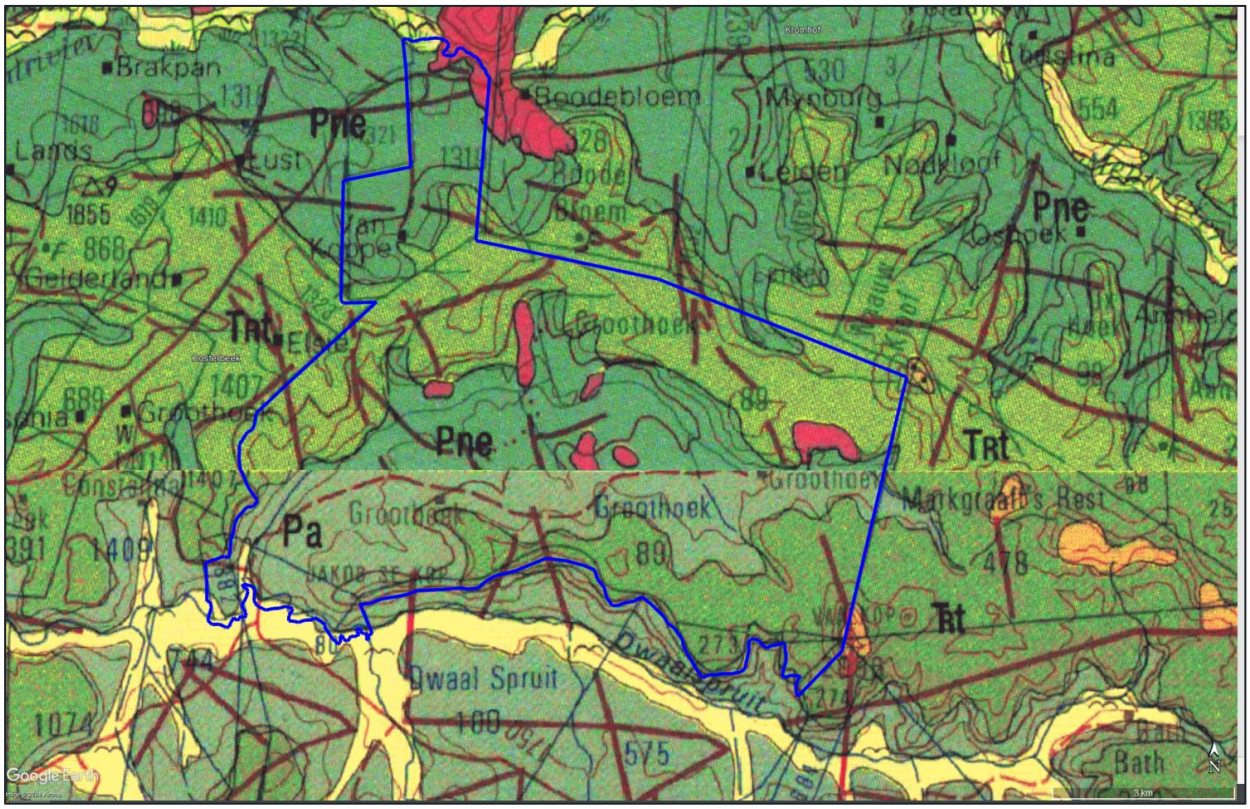

Figure 6-2 - Geological Map of the Project Area

Table 6-2 - Lithostratigraphy of the Study Area

Supergroup	Group	Subgroup	Formation	Lithology	Map Symbol
Recent deposits				Alluvium	
Intrusives				Dolerite, Dolerite dyke	Jd
Karoo	Beaufort	Tarkastad	• Driekoppen Formation • Verkykerskop Formation	• Brownish-red mudstone, interbedded fine grained reddish sandstone. • Fine to coarse grained feldspathic sandstone, subordinate sandstone and brown-re mudstone. • Fine to medium grained sandstone, red, green and blue mudstone.	Trt
		Adelaide	• Normandien Formation • Estcourt Formation	• Olive green and grey mudstone, subordinate sandstone. • Fine to coarse grained sandstone, grey shale	Pne

Supergroup	Group	Subgroup	Formation	Lithology	Map Symbol
				• Grey mudstone, dark grey shale (carbonaceous in places), siltstone and sandstone	Pa

6.2 BIOLOGICAL ENVIRONMENT

6.2.1 TERRESTRIAL BIODIVERSITY

The following is extracted from the Terrestrial Biodiversity Scoping Report compiled by WSP Group Africa (Pty) Ltd and included as Appendix G.6.

6.2.1.1 Regional Terrestrial biodiversity context

The Project area consists of CBAs and ESAs (**Figure 6-3**), which are largely aligned with grassland, cultivated stands and a single water body West of the Project area (**Figure 6-4**). In addition to species identified by the screening tool, desktop studies revealed additional animal and plant species that could possibly occur in the Project area. The full expected species lists can be seen in **Appendix 1** and **2** of the specialist report respectively. The Least Concern Eastern Free State Sandy Grassland (Gm4) vegetation type covers the land (**Figure 6-12**). In addition, the Grasslands' Important Bird Area (IBA) occurs 5km to the North of the Project area and Alexpan IBA occurs 16km South-West of the Project area These key features are further discussed in the sections that follow.

6.2.1.2 Terrestrial Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)

The Project area was compared to relevant available spatial biodiversity planning datasets, i.e. the Free State Biodiversity Sector Plan (2019), in order to assess the local and regional biodiversity context of the site.

The Free State Biodiversity Sector Plan defines five categories of conservation focus; protected areas, CBA, ESA, other natural areas, and modified habitats. Definitions for each are listed below. These areas present risks to the Project in terms of impact, as well as opportunities for contribution to achieving provincially-set targets for biodiversity conservation, through focused biodiversity management planning and adherence to the mitigation hierarchy at EIA stage:

- Protected Areas: protected areas recognised in terms of the National Environmental Management Protected Areas Act, No. 57 of 2003, that are currently considered to meet biodiversity targets in the MBSP.
- Critical Biodiversity Area: areas (outside of Protected Areas) that are required to meet biodiversity targets for biodiversity pattern (species and ecosystems) and ecological processes. They should remain in a natural state that is maintained in good ecological condition.
- Ecological Support Area: play an important role in supporting the ecological functioning of critical biodiversity areas or for generating or delivering important ecosystem services. They support landscape connectivity and resilience to climate change adaptation. They need to be maintained in at least an ecologically functional state.
- Other Natural Areas: often retain much of their natural character and may contribute significantly to maintenance of viable species populations and natural ecosystem functioning, and may

provide important ecological infrastructure and ecosystem services. They are not, however, prioritized for immediate conservation action in the MBSP.

- Modified: often referred to as transformed, these areas have lost a significant proportion (or all) of their natural biodiversity and in which ecological processes have broken down (in some cases irretrievably), as a result of biodiversity-incompatible land-use practices such as ploughing, hardening of surfaces, mining, cultivation and the construction of houses or other built infrastructure.

The entirety of the Project area is mapped as CBAs and ESAs (**Figure 6-3**), which are largely aligned with grassland, cultivated stands and a single water body West of the Project area as presented in the national landcover dataset (GTI, 2020) **(Figure 6-4**). These datasets are based on satellite imagery interpretation and as such the data may be aged, or require in-field verification. A key outcome of the vegetation and flora baseline study which will be conducted is the vegetation map of the Project area, which defines the location and extent of natural and modified vegetation communities – these will be utilised for CBA/ESA extent verification purposes in the Terrestrial Biodiversity Specialist Assessment at EIA stage.

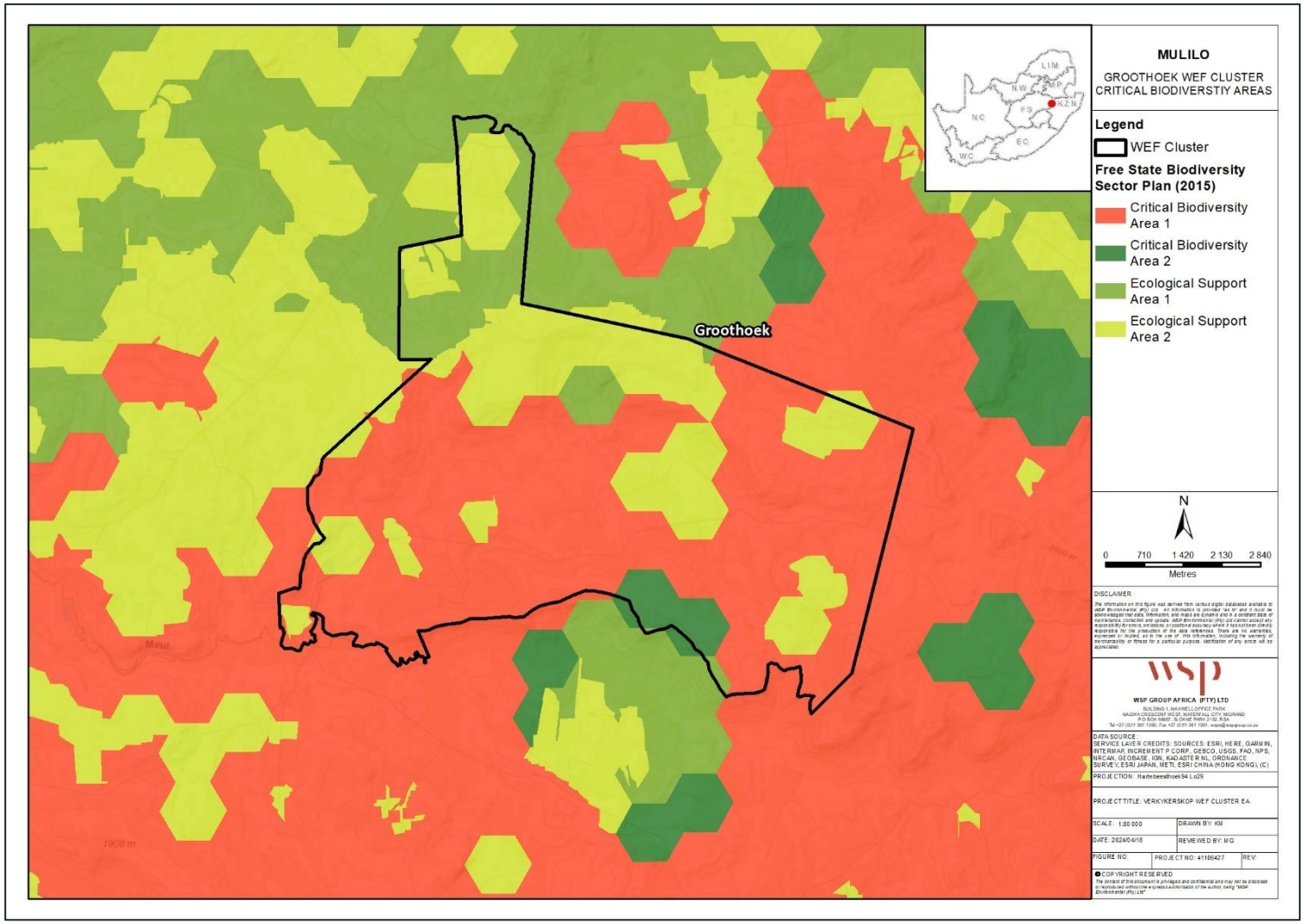

Figure 6-3 - Project area in relation to FSBSP (2015)

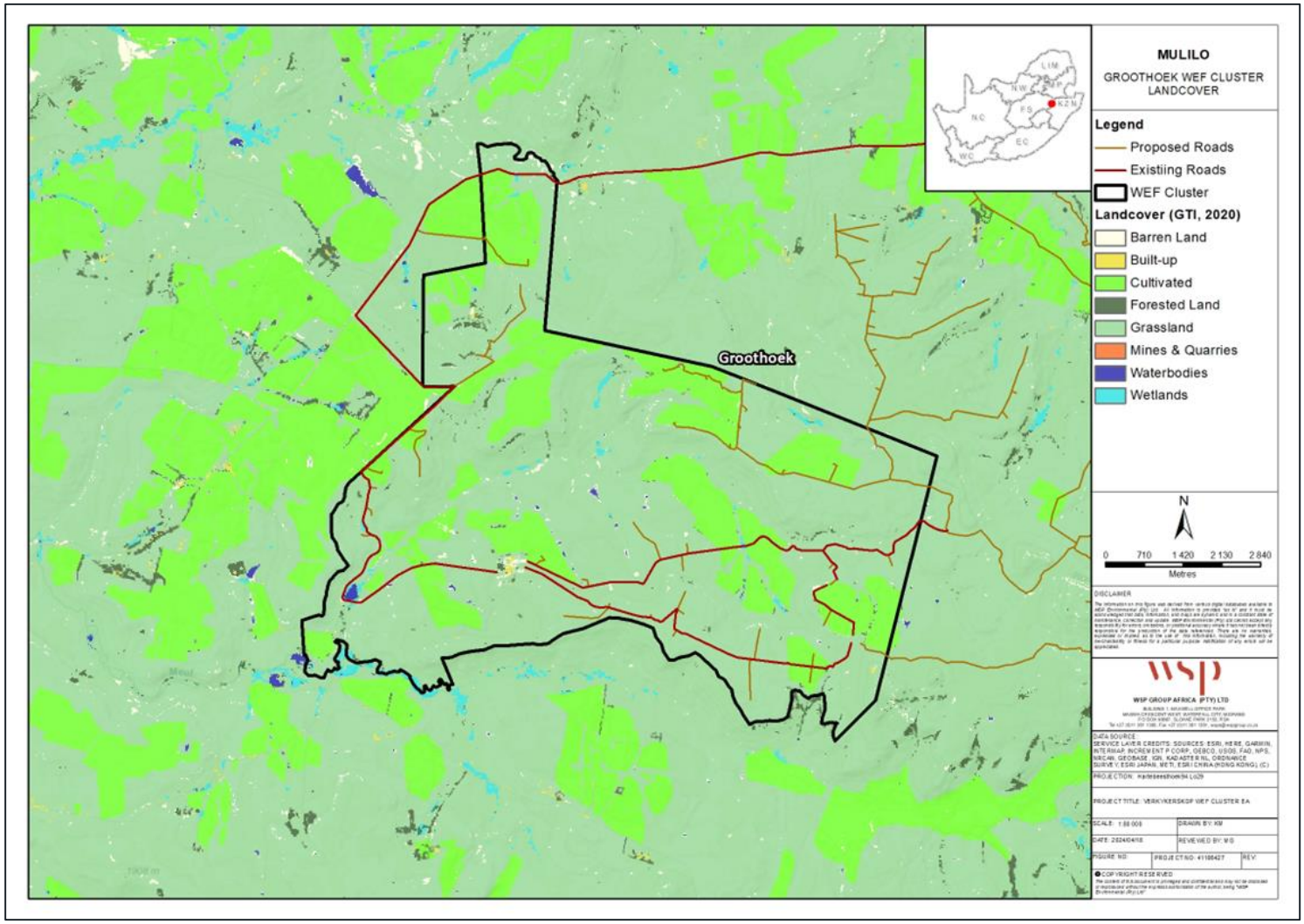

Figure 6-4 - Landcover dataset for Project area (GTI,2020)

6.2.1.3 Priority Areas for Protected Area Expansion

The majority of the development footprint coincides with areas that have been identified as Priority Focus Areas as part of the National Protected Area Expansion Strategy (2018) (**Figure 6-5**), which is aligned with the FSBSP CBAs and ESAs (**Figure 6-3**).

6.2.1.4 Protected Areas

No nationally protected areas are situated within the project area, with the closest feature listed on the National Protected Areas Register (DFFE, 2022) being the Upper Wilge Protected Environment, which lies at the South-West to the Project area (**Figure 6-6**).

6.2.1.5 Key Biodiversity Areas

As per communication from BirdLife South Africa (July 2024) it should be noted that IBA's are being replaced by Key Biodiversity Areas (KBA's).

Key Biodiversity Areas (KBA's) are 'sites that contribute significantly to the global persistence of biodiversity', which means they are the most important places in the world for species and their habitats – whether these be in terrestrial, freshwater, estuarine or marine ecosystem (Key Biodiversity Areas, 2024).

The Global Standard for the Identification of Key Biodiversity Areas, published in 2016, sets out internationally agreed scientific criteria for the identification of KBAs worldwide. Sites qualify as global KBAs if they meet the specific standardised criteria and quantitative thresholds focused on one or more of five trigger aspects:

- Threatened biodiversity
- Geographically restricted biodiversity
- Ecological integrity
- Biological processes
- Irreplaceability through quantitative analysis

The Project Site only overlaps with the Eastern Free State Escarpment Key Biodiversity Area (KBA ID S471) (**Figure 6-8**).

Eastern Free State Escarpment is a large terrestrial site with substantial protection, found in the Free State, South Africa. Most of the site is composed of flat to slightly undulating and undulating terrain with streams and rivers that drain the foothills of the Drakensberg. Vegetation consists of closed grassland dominated by *Eragrostis curvula, Tristachya leucothrix* and *Themeda triandra.* Embedded within the site are many hills and small mountains carrying Basotho Montane Shrubland. Due to wide range of grazing and fire regimes, the grassland has a patchy appearance. A smaller portion of the landscape is comprised of undulating grassland plains, with small, scattered patches of dolerite outcrops in areas. *Protea caffra* communities and patches of *Leucosidea* scrub feature at higher altitudes. Whereas on steep talus slopes and kloofs of the mesas and other mountain flanks supporting tall, in places very dense shrubland dominated by broad-leaved *mesophyllous* shrubs. Mesas are often encircled by striking upper cliffs of Clarens Sandstone.

This site qualifies as a Key Biodiversity Area 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, 8 species meet one or more KBA criteria for this site. The KBA trigger species at this site include birds, mammals, and reptiles. The site meets criterion A1 due to the presence of significant

proportions of the global populations of 6 threatened species. An assemblage of co-occurring range-restricted species in the Aves taxonomic group regularly present within the site meets criterion B2. A quantitative analysis of irreplaceability indicate that the site is 100% irreplaceable for the global persistence of 2 species, therefore meeting criterion E.

15 other potential trigger species meet minimum population parameter thresholds for the site, but presence and/or minimum reproductive units (RU) required to meet KBA criteria cannot be confirmed with available data.

6.2.1.6 Important Bird Areas

Grasslands' IBA occurs 5km to the North of the Project area (**Figure 6-7**). It contains wetlands of international importance (Birdlife International, 2024). The IBA supports large numbers of a rich diversity of resident and migratory waterbirds, in addition to most of South Africa's threatened and endemic grassland species including;

- A significant proportion of the globally endangered Sensitive Species 23;
- 85% of the global population of Rudd's Lark (*Heteromirafra ruddi*);
- Botha's Lark (*Spizocorys fringillaris*), which is highly localized within moist clay highveld grassland on black clays or dolerite soils.
- Yellow-breasted Pipit (*Anthus chloris*) which favours mid-altitude, well-developed grassland.
- The world's largest breeding colonies of Southern Bald Ibis (*Geronticus calvus*).
- Widespread populations of Blue crane (*Grus paradisea*), Black-winged Pratincole (*Glareola*
- *nordmanni*), Denham's Bustard (*Neotis denhami*) and White-bellied Korhaan (*Eupodotis senegalensis*).
- African Rock Pipit (*Anthus crenatus*), Ground Woodpecker (*Geocolaptes olivaceus*), Buff-streaked chat (*Saxicola bifasciata*) and Cape Rock Thrush (*Monticola rupestris*) occurring on exposed outcrops and rocky slopes at higher altitudes;
- Gurney's sugarbird (*Promerops gurneyi*) occurring around proteoid woodland on the escarpment.
- Black Stork (Ciconia nigra) which breeds on steep cliffs;
- Chorister Robin-chat (*Cossypha dichroa*), Forest Canary (*Serinus scotops*), Bush Blackcap
- (*Lioptilus nigricapillus*) and Orange Ground Thrush (*Zoothera gurneyi*) populations occurring in forested patches.

Alexpan (ZA032) IBA occurs 16km South-West of the Project area and provides grassland-highveld habitat for Southern Bald Ibis (*G.calvus*)-Vulnerable, Rudd's Lark (H.*ruddi*)- Endangered, Botha's Lark (*S. fringillaris*)-Endangered and Yellow-breasted Pipit (*H. chloris*)-Vulnerable.

IBA designation is not a statutory level of protection, and does not preclude wind farm development, however, avoidance where possible is advised (BirdLIfe South Africa (BLSA), 2019), It is likely that this will be a focus of discussion once consultations with relevant provincial and non-governmental (BLSA, Endangered Wildlife Trust) conservation organisations are held; and underscores the need for a very robust preconstruction bird monitoring programme. Early consultation with BLSA is recommended, since Sensitive Species 23 is very cryptic and difficult to survey (survey is only possible via acoustic methods, and its call parameters have not yet been made public) and is understood to fly at night, which presents a significant risk of BLSA objection to a WEF development. The possible impacts of the Project and mitigation strategies will be delt with in a separate Avifauna study.

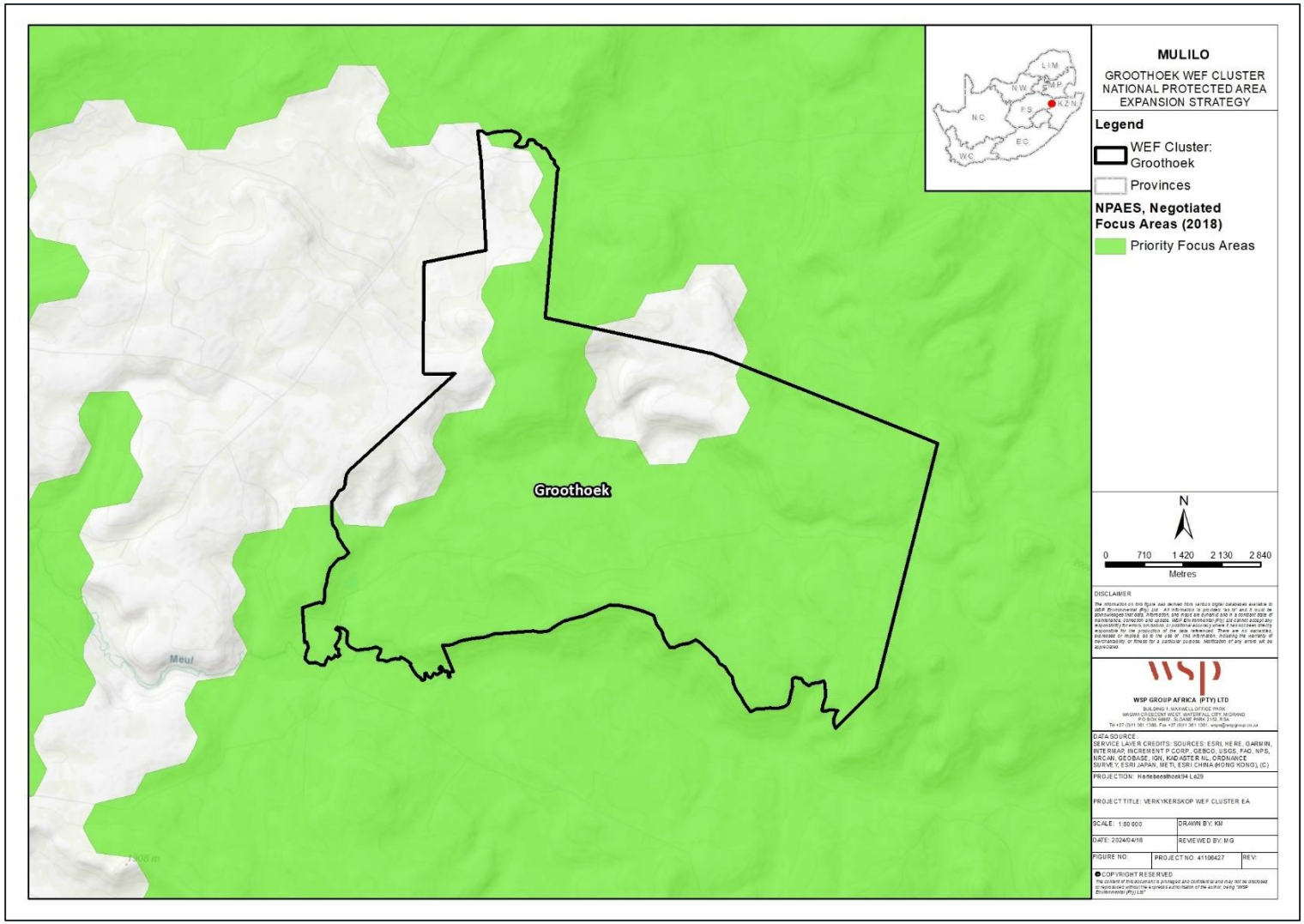

Figure 6-5 - Project area in relation to National Protected Area Expansion Strategy (2018)

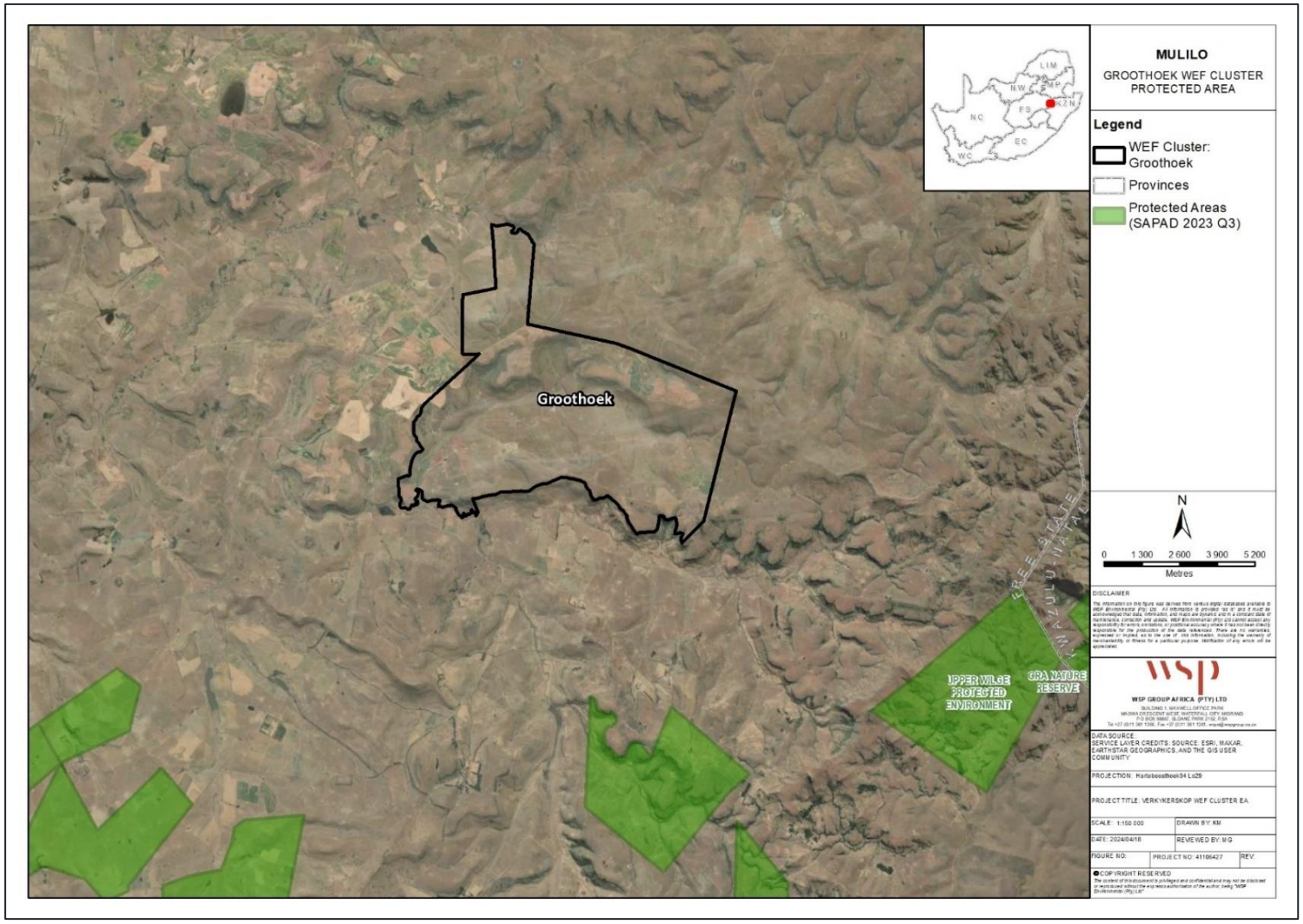

Figure 6-6 - Project area in relation to South African Protected Area Database (2023)

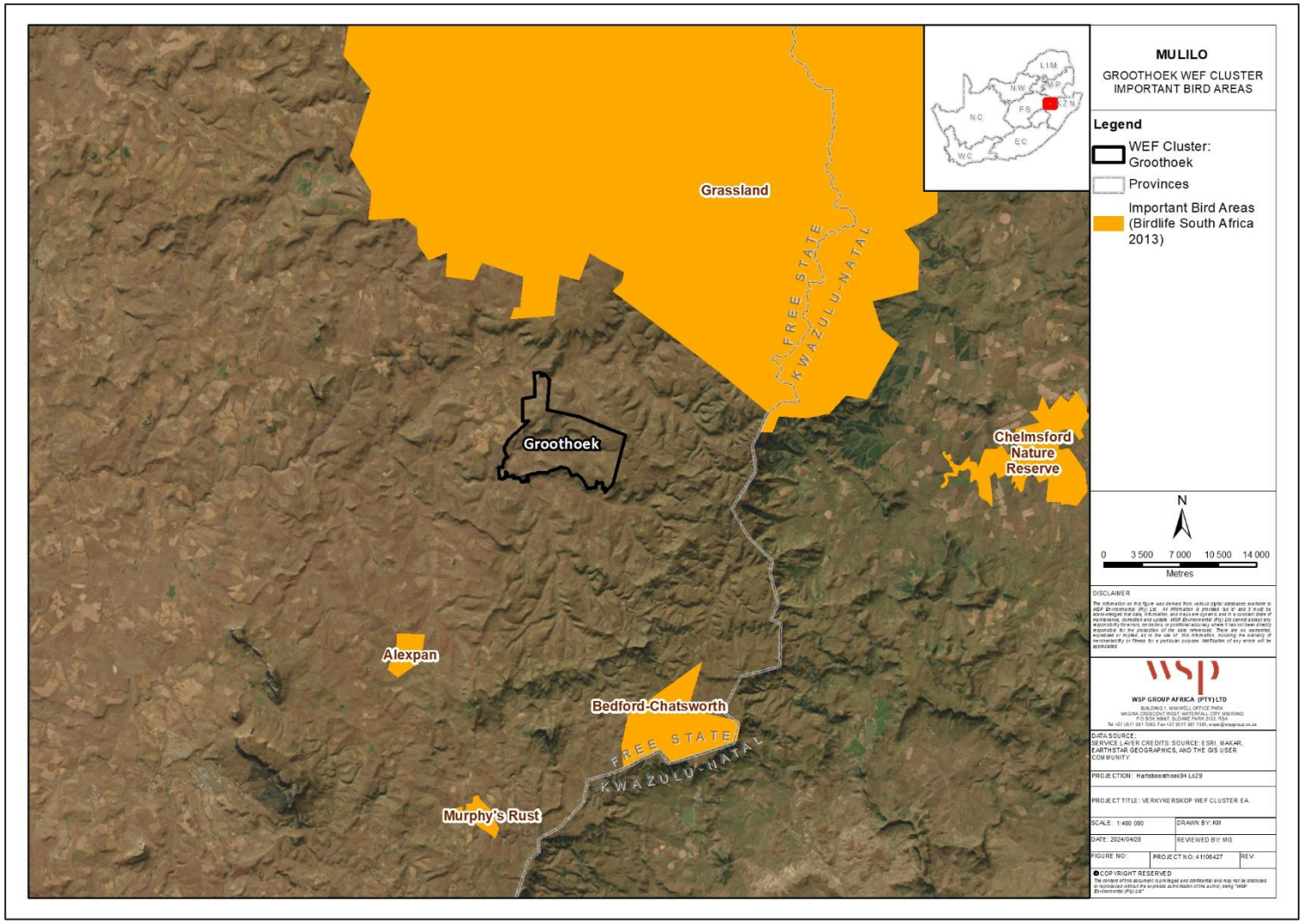

Figure 6-7 - Project area in relation to Important Bird Areas (2013)

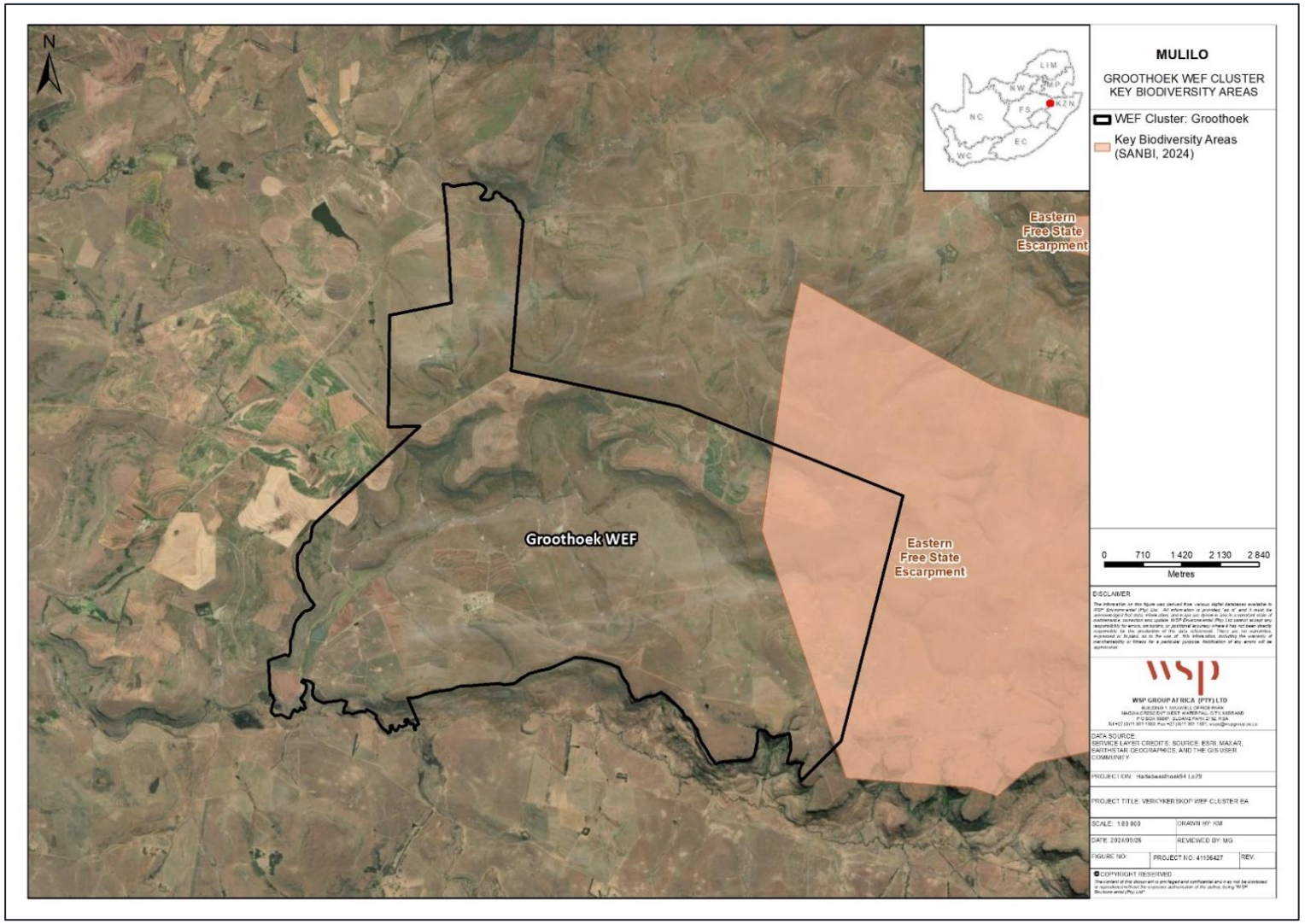

Figure 6-8 - Project area in relation to Key Biodiversity Areas (2024)

6.2.2 AQUATIC BIODIVERSITY

The following is extracted from the Terrestrial and Aquatic Biodiversity Scoping Report compiled by WSP Group Africa (Pty) Ltd and included as Appendix G.5.

This section summarises, at a mainly desktop level, the baseline aquatic and terrestrial environment of the local and regional study areas. It draws upon existing studies, published information, and local knowledge.

6.2.2.1 Regional aquatic biodiversity context

Freshwater ecosystems were identified from desktop screening. The majority of these freshwater ecosystems meet the definition of a wetland as contained in the National Water Act, 1998 (Act No. 36 of 1998). However, the classification of aquatic systems can only be undertaken during site verification.

The majority of the freshwater ecosystems are likely to be in a degraded ecological state characterised by commercial agriculture, which has encroached on the freshwater ecosystems likely leading to altered floral assemblages and soil profiles.

Given the extent of agricultural activities in the region, the protection of water and freshwater ecosystems is considered of prime importance, and efforts must be made to ensure that wherever possible, the proposed wind energy facility does not impact negatively on the freshwater ecosystems. Although total avoidance of all freshwater ecosystems is unlikely to be feasible, in relation to linear infrastructure (access roads and powerlines), the information presented in this report must be utilised during the planning phase to ensure that as far as possible, all infrastructure is located outside of the freshwater ecosystems and their associated Zones of Regulation. Additionally, the information presented herein is intended to guide the EAP and proponent on the necessary enviro-legal authorisations which may be required, should the proposed wind energy facility proceed. A detailed site assessment to verify and refine the delineations, ecological integrity and sensitivity of the freshwater ecosystems, as well as the significance of risks posed by the proposed WEF development must be undertaken prior to applying for the necessary enviro-legal authorisations.

The Project area falls within the middle Vaal Water Management Area, and the quaternary catchment C81L. The Dwaalspruit forms a channel running south of the Project Area within the C81L catchment. The area receives a mean annual precipitation of approximately 500mm to 700mm (DWS, 2014) is ecologically stressed due anthropogenic activities such as agriculture.

6.2.2.2 Freshwater ecosystem priority area (FEPA) sub-catchments

The listed NFEPA wetland running West of the Project area and FEPA sub-catchments are listed in **Figure 6-9** and **Figure 6-10** below.

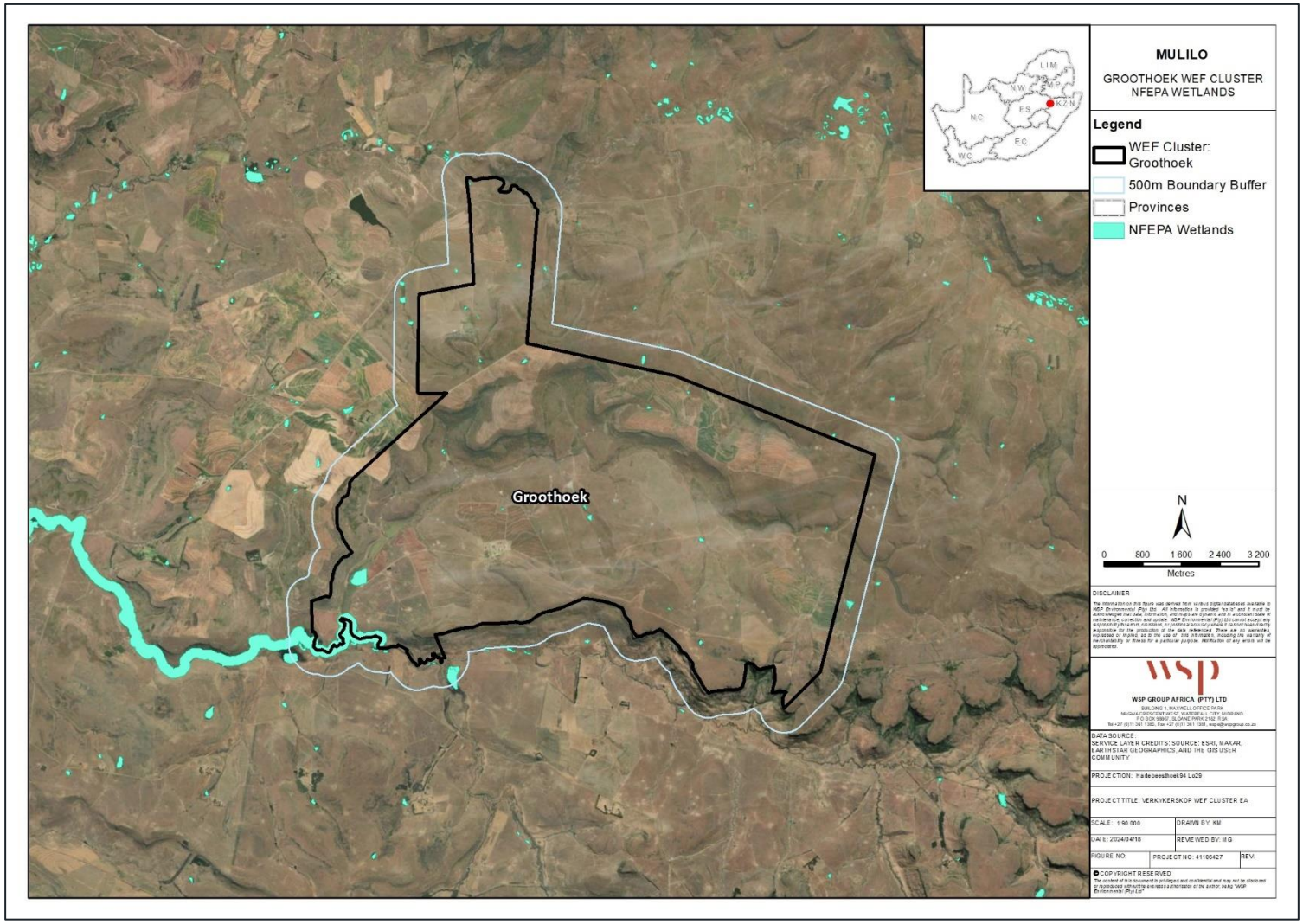

Figure 6-9 - Project area in relation to NFEPA Wetland

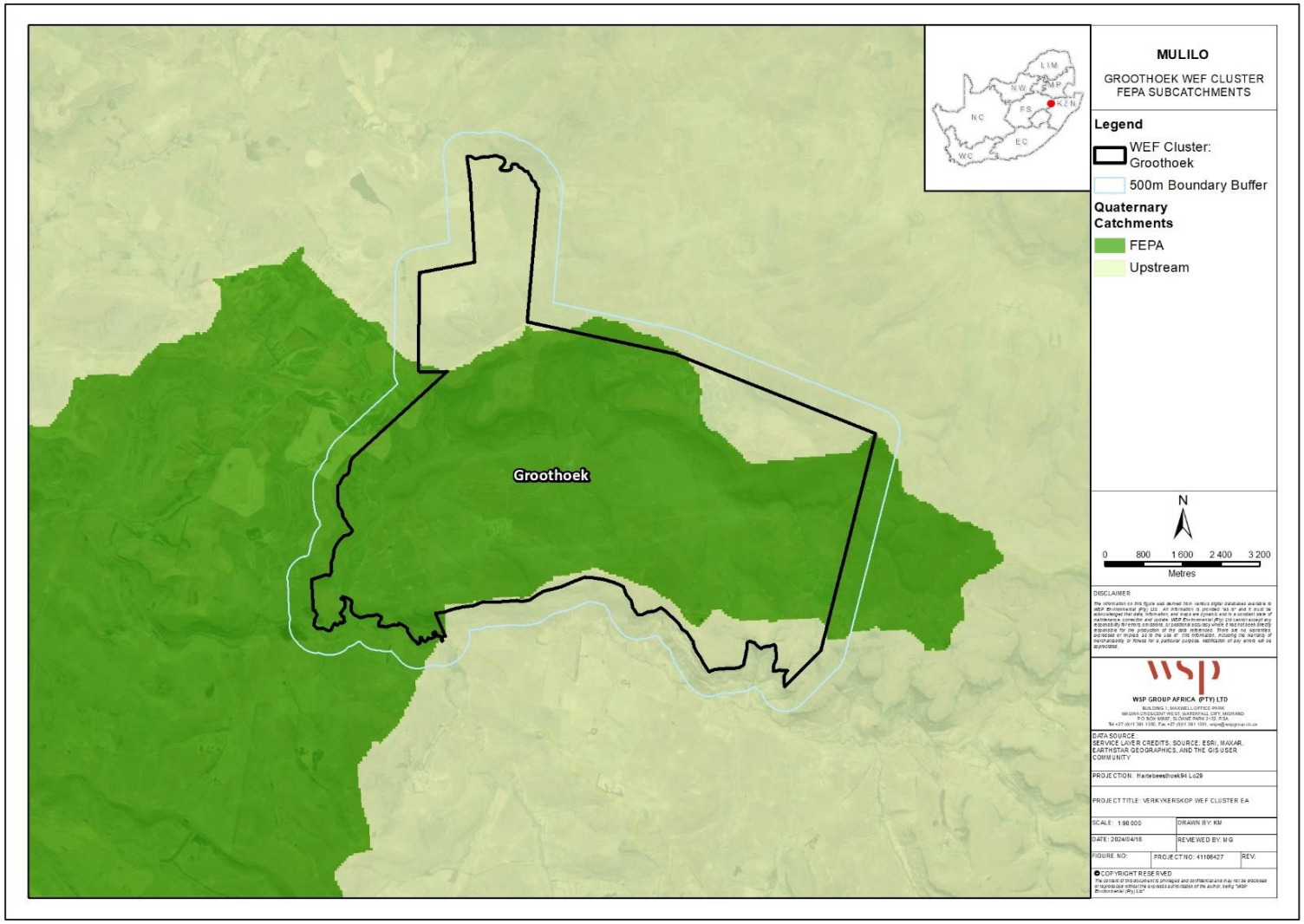

Figure 6-10 - Project area in relation to FEPA sub catchments

6.2.2.3 National Wetland Map 5 wetlands

The South African National Wetland Map version 5 (NWM5) portrays the most up-to-date spatial data for the extent and types of estuarine and inland aquatic (freshwater) ecosystems of South Africa (Van Deventer et al., 2019). The proposed development footprint in relation to wetlands mapped as part of the National Wetland Map 5 project is illustrated on **Figure 6-11**. The project area is encompassed by flood plain wetlands, two channelled-valley bottom wetlands as well as a river running west of the Project area. The presence and extent of these aquatic features will need to be confirmed during the site verification process.

6.2.2.4 Wetland Delineation and Classification

The study area contains wetlands which were historically part of a larger system, but which have been extensively transformed by crop cultivation. Detailed wetland delineation and classification will be provided the wetland baseline assessment report following field survey scheduled for April 2024.

6.2.2.5 Baseline Aquatic Biomonitoring Locations

Baseline aquatic biomonitoring locations for the Project area have been selected based on the proposed positioning of WEF infrastructure and access roads, and the future need to measure and monitor potential impacts on the various surface water systems that coincide and interact with the proposed infrastructure and activities. The baseline aquatic monitoring locations will be presented in the overall Aquatic Biodiversity Specialist Assessment that will be produced in support of the EIA.

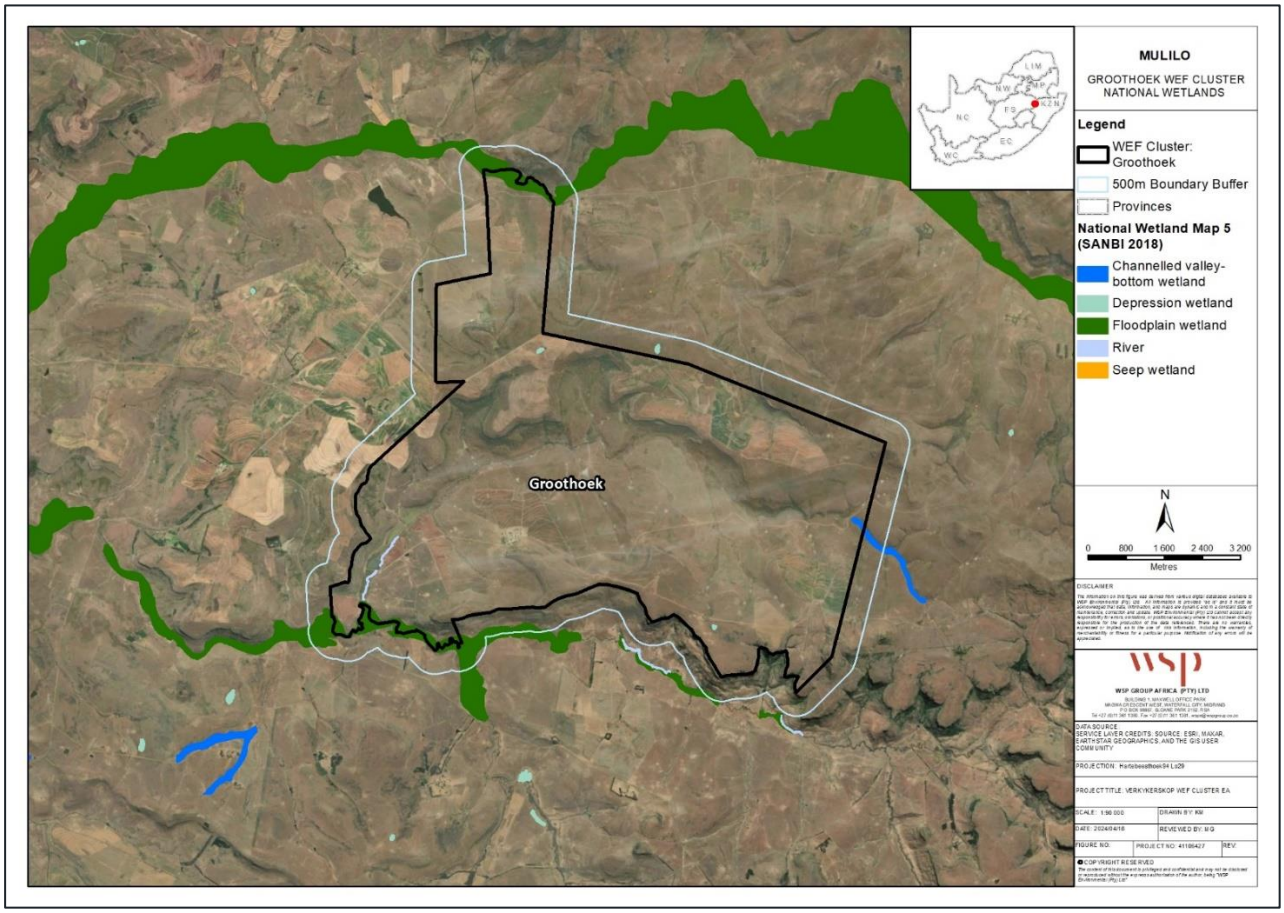

Figure 6-11 - Project area in relation to NWM5

6.2.3 PLANT SPECIES

The following is extracted from the Terrestrial Biodiversity Scoping Report compiled by WSP Group Africa (Pty) Ltd and included as Appendix G.6.

One vegetation type occurs across the proposed Project area being, Eastern Free State Sandy Grassland (Gm4) (**Figure 6-12**). This vegetation type was previously listed as Near Threatened by the National Threatened Ecosystems Map as can be seen in **Figure 6-13**, however has since been reclassified to Least Concern by South Africa's Red list of Terrestrial Ecosystems (2021).

6.2.3.1 Flora Features of Conservation Concern

The majority of the Project area is considered to be of 'Medium sensitivity' in terms of the Plant Species Theme of the National Screening Tool, on account of the potential presence of at least two Vulnerable flora species namely the sensitive species 1252 and 998. An additional 10 species have been identified from desktop assessment. These include:

- Sensitive Species 1248 (Endangered);
- Sensitive Species 851 (Vulnerable);
- *Prunus Africana* (Vulnerable);
- *Zaluzianskya distans* (Vulnerable);
- *Anemone fanninii* (Near Threatened);
- *Eucomis bicolor* (Near Threatened);
- *Polygala praticola* (Near Threatened);
- *Merwilla plumbea* (Near Threatened);
- *Ocotea bullata* (Endangered) and
- *Lotononis amajubica* (Rare).

The presence of these species will only be confirmed upon completion of Flora site verification process.

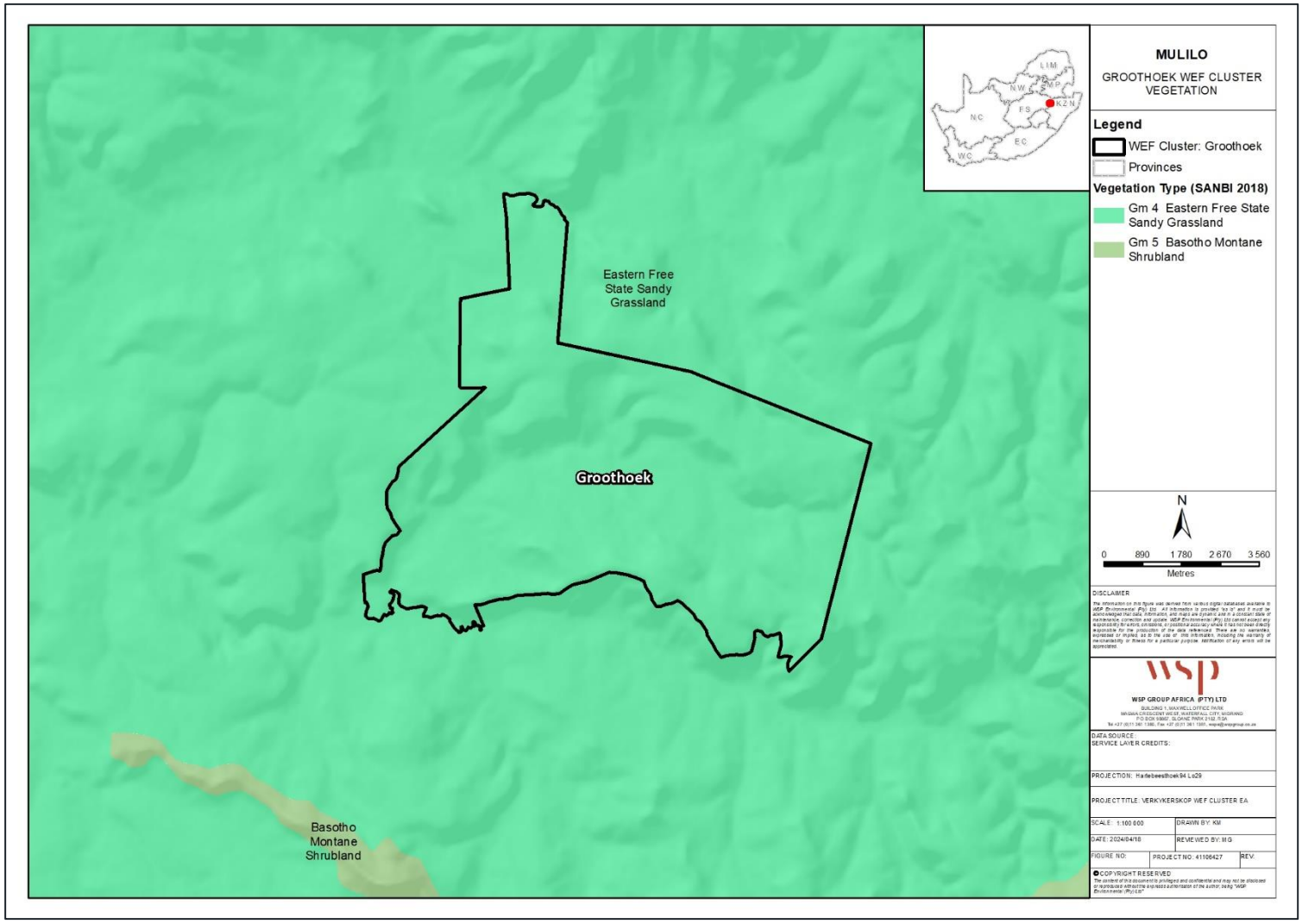

Figure 6-12 - Project area in relation to National Vegetation Types

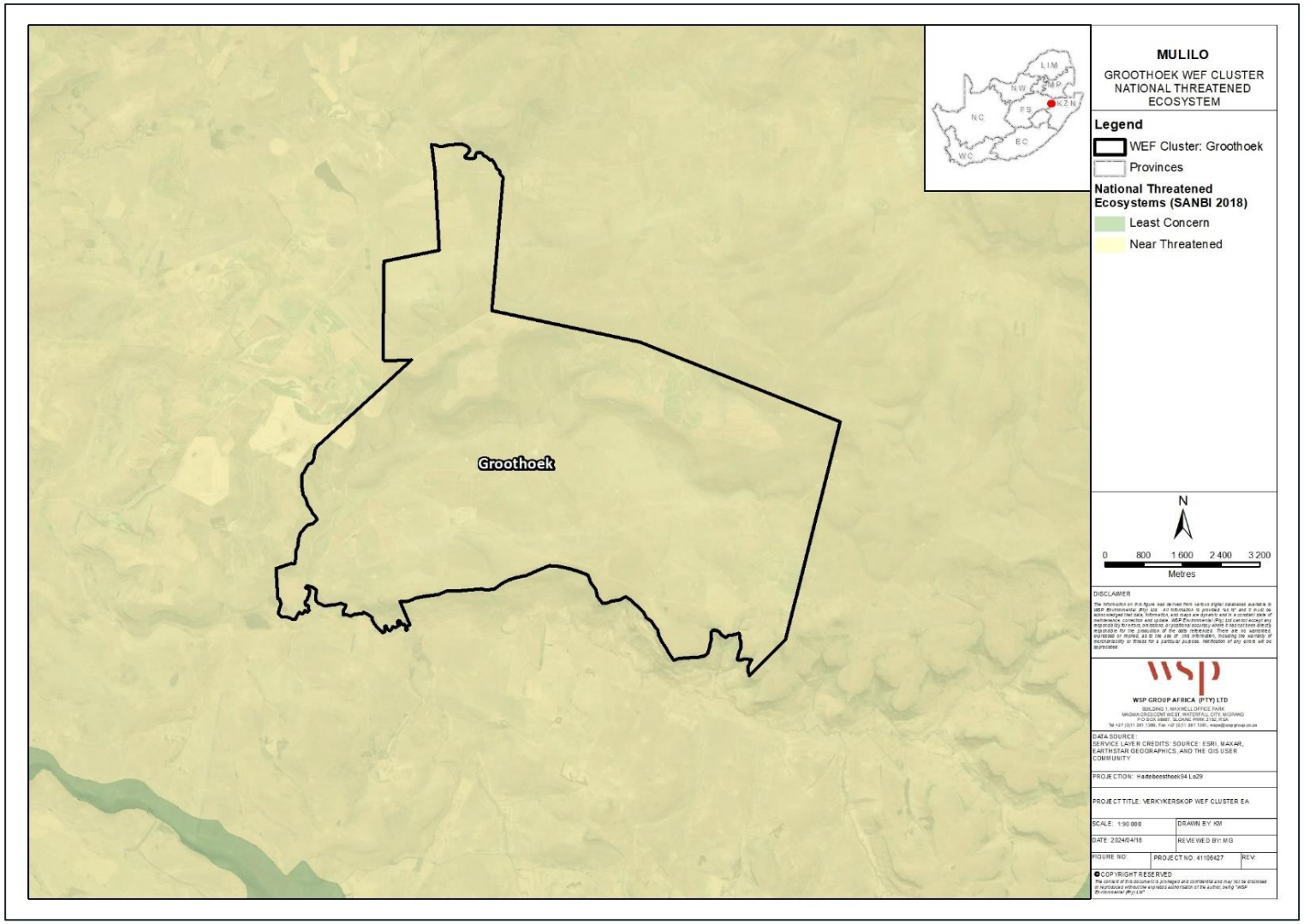

Figure 6-13 - Project area in relation to National Threatened Ecosystems

6.2.4 ANIMAL SPECIES

The following is extracted from the Terrestrial Biodiversity Scoping Report compiled by WSP Group Africa (Pty) Ltd and included as Appendix G.6.

The fauna biodiversity of the region is relatively well-known. Details of fauna species of conservation concern (SCC) with potential to occur in the project are summarised in the sections that follow. Thes occurrence of these species in the Project area will need to be confirmed during detailed site verification process.

6.2.4.1 Mammals

Fifteen mammal species of conservation concern (SCC) could potentially be present in undisturbed areas of primary grasslands and wetlands but are not expected to be present in cultivated lands These include:

- Two Critically endangered species: Black Rhino (*Diceros bicornis*); Mountain Reedbuck (*Redunca fulvorufula*);
- Nine Near threatened species: Brown Hyaena (*Parahyaena brunnea*); African Buffalo (*Syncerus caffer*); Grey Rhebok (*Pelea capreolus*); African Clawless Otter (*Aonyx capensis*); Highveld Golden Mole (*Amblysomus septentrionalis*); White Rhino (*Ceratotherium simum*); Plains Zebra (*Equus quagga*); Serval (*Leptailurus serval*) and Vlei Rat (*Otomys auratus*);
- Three Vulnerable species: White-tailed Rat (*Mystromys albicaudatus*); Oribi (*Ourebia ourebi ourebi*); Spotted necked Otter (*Hydrictis maculicollis*); and
- One Endangered species: Black-footed Cat (*Felis nigripes*).

Due to the extent of environmental degradation present from agricultural stands, it is unlikely that large mammals such Buffalo, Zebra and Hyaena occur in the project area due to illegal poaching that subsequently stems from anthropogenic activity in the area. Furthermore, it is confirmed that there are no Rhino on the project site.

6.2.4.2 Herpetofauna

Although the national screening tool indicates no sensitivities in terms of support of herpetofauna; three reptile species have been identified from desktop assessment. These include the Near Threatened: Drakensberg Dwarf Chameleon (*Bradypodion dracomontanum*) and Breyer's Long-Tailed Seps (*Tetradactylus breyeri*) as well as the Vulnerable Giant Dragon Lizard (*Smaug giganteus*). No amphibian SCC are anticipated to occur in the Project area (FrogMAP, 2022).

6.2.4.3 Invertebrates

The national screening tool flags potential presence of the Vulnerable, range-restricted invertebrate species Lalande's Black-winged Clonia (*Clonia lalandei*). No other invertebrate SCC have been flagged in the Project area.

6.2.4.4 Existing Impacts on Biodiversity and Drivers of Change

The proposed project infrastructure will be situated in a largely untransformed landscape, interspersed by low density cultivated fields and occasional exotic tree plantations, from which a low level of impact has occurred through habitat transformation. Barriers to faunal movement in the shape of dirt roads and cattle/boundary fencing occur throughout the Project area.

6.2.5 AVIFAUNA

The following is extracted from the Avifauna Scoping Report compiled by The Biodiversity Company and included as Appendix G.7.

6.2.5.1 Pertinent Findings from the Preconstruction Monitoring

Local Avian Diversity

Habitats

The more westerly position of the Groothoek WEF affords it a noticeably drier climate relative to the other three WEFs within the Verkykerskop WEF Cluster (VWC). The land use is predominantly natural grasslands (under grazing), interspersed with commercial croplands and pasture lands. The prevailing biome is grassland. More specifically, Eastern Free State Sandy Grassland predominates (Mucina and Rutherford, 2006). However, the incised mountainous topography creates a diversity of structural, edaphic and microclimatic conditions which gives rise to several clearly distinct vegetation units. At this stage at least four broad habitats as relevant to avifauna were identified. These included Open Grassland, Rocky Grassland, Wetlands and Croplands (**Figure 6-14**).

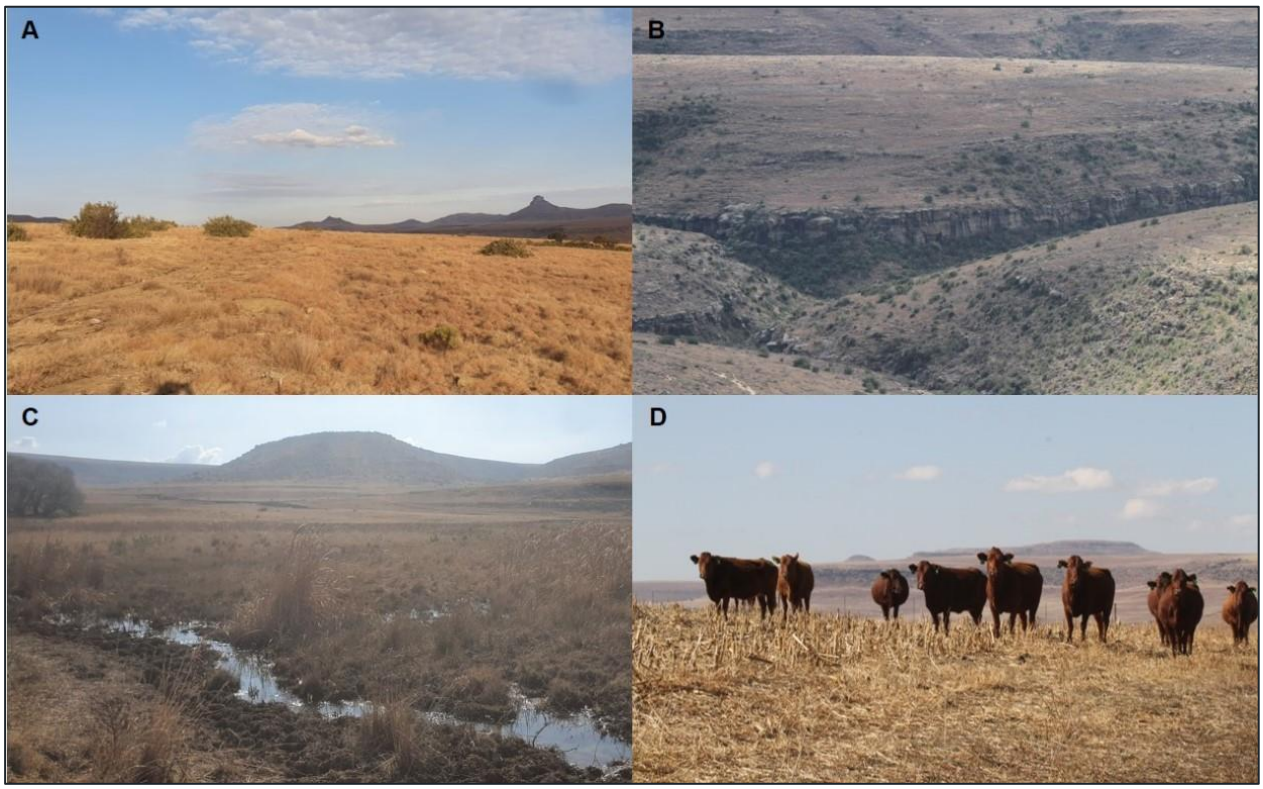

Figure 6-14 Examples of the four main avifaunal habitats identified in the project area; A) Open Grassland, B) Rocky Grassland, C) Wetlands and D) Croplands

Expected Site Diversity

A total of 218 bird species have been recorded during atlassing surveys (SABAP2, 2022) within the nine pentads that overlap the VWC (see figure below). This inventory is considered to be a relatively accurate, if not slightly under-representative, portrayal of regional diversity. Consequently, this list was supplemented with additional species known to occur based on Chittenden et al. (2016) and expert knowledge of avifauna from the region. This integrated inventory, totalling 294 species, was used as the basis for the project's species probability list, as presented in Appendix A.

Of these regionally occurring species, around 230 are considered highly likely to occur on a regular basis in the Groothoek WEF. However, when considering seasonal variation in species assemblages and local movements, the number of species likely to be encountered on any day in the project area is typically to be < 120 species.

Observed Site Diversity

Over the course of the Year 1 pre-construction monitoring, a total of 168 bird species were recorded by the project team within Groothoek WEF (which represents 75% of the 224 species recorded in the AOI). This inventory will gradually increase over time but should be considered a good representation of the typical bird assemblage in the project area. Although this represents moderate diversity in South Africa, it is important to remember that a very high proportion are red-listed and/or endemic species.

Priority Species

Table 6-3 provides a list of the 70 regionally occurring priority species along with their likelihood of occurrence within the project area. This list also details their level of endemism and conservation status at global, national and provincial levels. The birds in **Table 6-3** have been short-listed as priority species based on their conservation status, level endemism, rarity, degree of habitat specialisation and potential susceptibility to impacts from wind energy developments. To date, 34 of the 70 regionally occurring priority species have been recorded in the Groothoek WEF (see LO column in **Table 6-3**). The GPS location of each Year 1 sighting has been documented in a database for the entire Verkykerskop WEF Cluster of 1620 point localities with a total count of 7748. This point locality data is shown in **Figure 6-16** and represents the basis of the kernel density model which was used to map hotspots for priority species as portrayed in **Figure 6-15**. This map shows that priority species are concentrated in at least six main hotspot areas throughout the Verkykerskop WEF Cluster, of which two occur in the Groothoek WEF. This data was later used to delineate core habitat areas for threatened high altitude, wetland and raptor species.

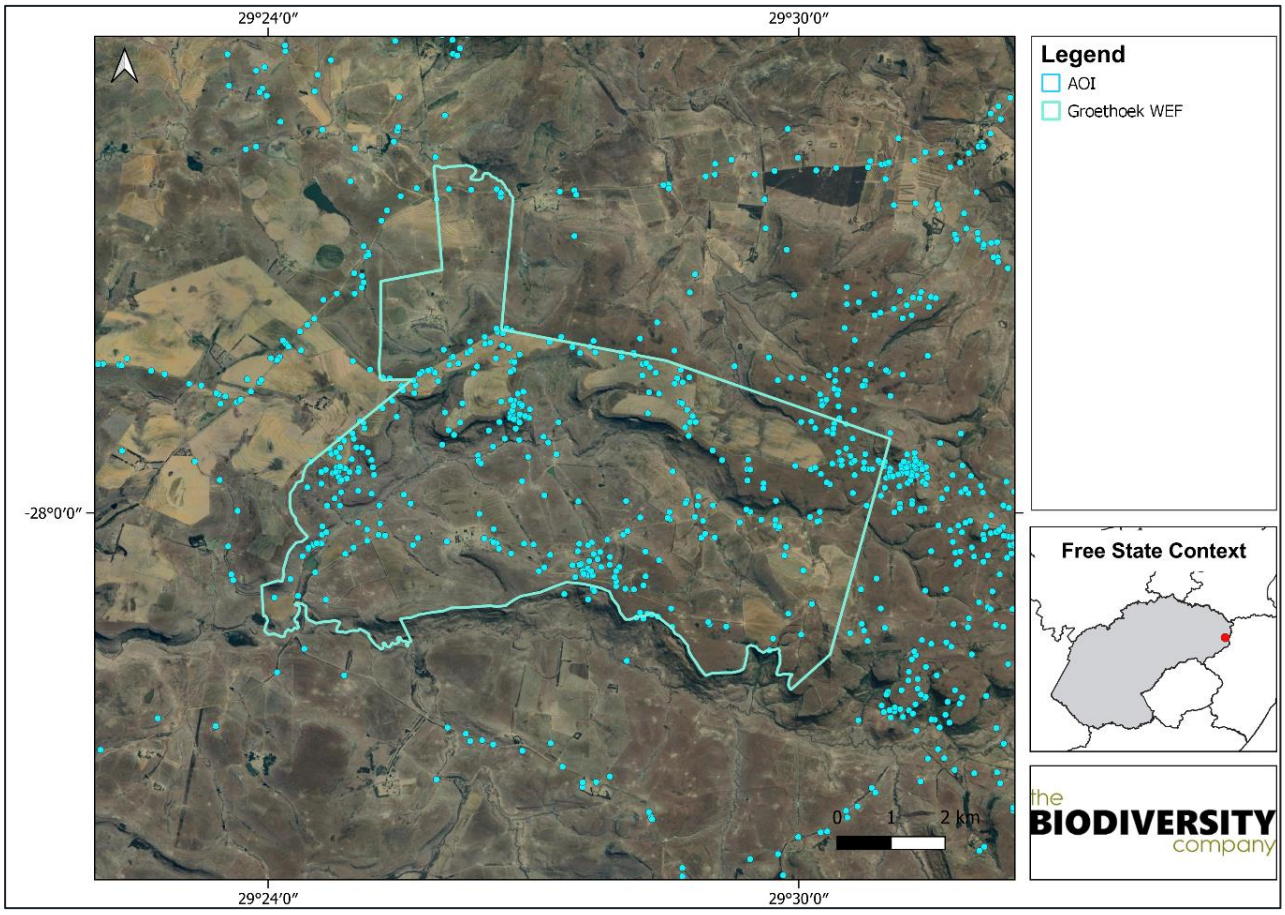

Figure 6-15 - Point localities of year 1 priority species observations

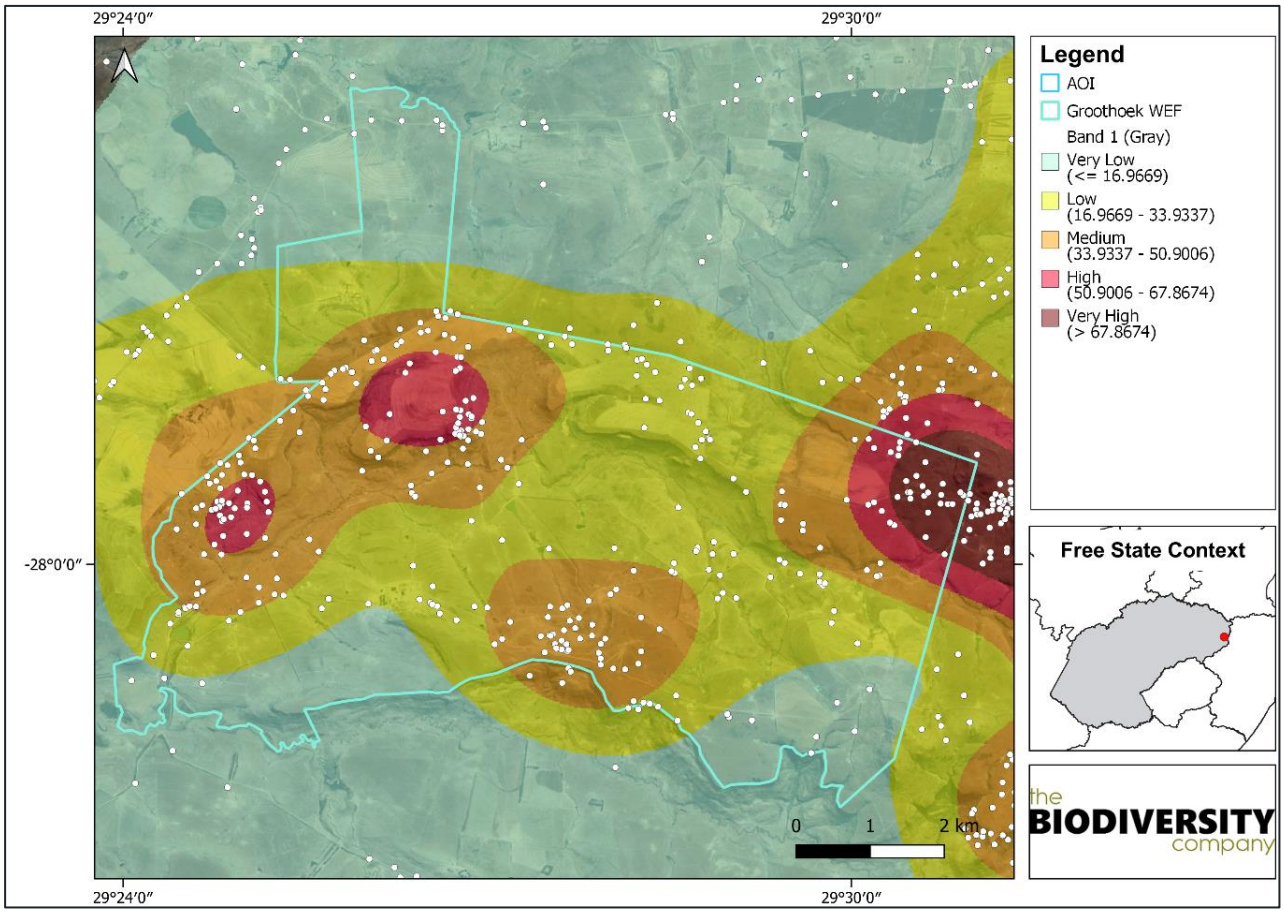

Figure 6-16 - Kernel density model portraying hotspots of priority species occurrence.

Table 6-3 List of present and potentially occurring priority species

Common Name	Scientific Name	Conservation Status					LO Groothoek	VK Cluster	AOI
		Global	Regional	TOPS	FS	Endemicity			
Wattled Crane	*Grus carunculata*	VU	CR	CR	PG		3	x	x
sensitive species 23	*sensitive species 23*	CR	CR		PG		4		
Bearded Vulture	*Gypaetus barbatus*	NT	CR	CR	PG		3		x
Grey Crowned Crane	*Balearica regulorum*	EN	EN	EN	PG		1	x	x
Black Harrier	*Circus maurus*	EN	EN		PG	NE	1	x	x
Cape Vulture	*Gyps coprotheres*	VU	EN	EN	PG		1	x	x
Rudd's Lark	*Heteromirafra ruddi*	EN	EN		PG	E	3	x	x
Martial Eagle	*Polemaetus bellicosus*	EN	EN	EN	PG		1	x	x
Botha's Lark	*Spizocorys fringillaris*	EN	EN		PG		3	x	x
Secretarybird	*Sagittarius serpentarius*	EN	VU		PG		1	x	x
Maccoa Duck	*Oxyura maccoa*	EN	NT		PG		3		x
African Marsh Harrier	*Circus ranivorus*	LC	EN		PG		1	x	x
Yellow-billed Stork	*Mycteria ibis*	LC	EN		PG		2	x	x
Bush Blackcap	*Sylvia nigricapillus*	VU	VU		PG	E	3	x	x
Yellow-breasted Pipit	*Anthus chloris*	VU	VU		PG	E	1	x	x
Southern Bald Ibis	*Geronticus calvus*	VU	VU	VU	PG	E	1	x	x

Common Name	Scientific Name	Conservation Status					LO Groothoek	VK Cluster	AOI
		Global	Regional	TOPS	FS	Endemicity			
Blue Crane	*Grus paradisea*	VU	NT	PS	OG		1	x	x
Red-footed Falcon	*Falco vespertinus*	VU	NT		PG		1	x	x
Denham's Bustard	*Neotis denhami*	NT	VU	VU	PG		1	x	x
Striped Flufftail	*Sarothrura affinis*	LC	VU		PG		3	x	x
Verreaux's Eagle	*Aquila verreauxii*	LC	VU		PG		1	x	x
Black Stork	*Ciconia nigra*	LC	VU		PG		3	x	x
White-bellied Korhaan (Bustard)	*Eupodotis senegalensis*	LC	VU		PG		1	x	x
Lanner Falcon	*Falco biarmicus*	LC	VU		PG		1	x	x
Short-tailed Pipit	*Anthus brachyurus*	LC	VU		PG		3		
Half-collared Kingfisher	*Alcedo semitorquata*	LC	NT		PG		3	x	x
African Rock Pipit	*Anthus crenatus*	LC	NT		PG	E	1	x	x
Crowned Eagle	*Stephanoaetus coronatus*	NT	VU		PG		4		
African Grass Owl	*Tyto capensis*	LC	VU		PG		4		
Blue Korhaan	*Eupodotis caerulescens*	NT	LC		PG	E	1	x	x
Ground Woodpecker	*Geocolaptes olivaceus*	NT	LC		PG	E	1	x	x
Sentinel Rock Thrush	*Monticola explorator*	NT	LC		PG	E	2	x	x
Pallid Harrier	*Circus macrourus*	NT	NT		PG		4		

Common Name	Scientific Name	Conservation Status					LO Groothoek	VK Cluster	AOI
		Global	Regional	TOPS	FS	Endemicity			
Black-winged Pratincole	*Glareola nordmanni*	NT	NT		PG		4		
Abdim's Stork	*Ciconia abdimii*	LC	NT		PG		3		
Marabou Stork	*Leptoptilos crumenifer*	LC	NT		PG		4		
Forest Buzzard	*Buteo trizonatus*	NT	LC		PG	E	3		
Black Sparrowhawk	*Accipiter melanoleucus*	LC	LC		PG		2	x	x
Little Sparrowhawk	*Accipiter minullus*	LC	LC		PG		2	x	x
Rufous-breasted Sparrowhawk	*Accipiter rufiventris*	LC	LC		PG		1	x	x
Marsh Owl	*Asio capensis*	LC	LC		PG		2	x	x
African Cuckoo Hawk	*Aviceda cuculoides*	LC	LC		PG		4		
Barratt's Warbler	*Bradypterus barratti*	LC	LC		PG	NE	2	x	x
Spotted Eagle-Owl	*Bubo africanus*	LC	LC		PG		1	x	x
Cape Eagle-Owl	*Bubo capensis*	LC	LC		PG		1	x	x
Common (Steppe) Buzzard	*Buteo buteo*	LC	LC		PG		1	x	x
Jackal Buzzard	*Buteo rufofuscus*	LC	LC		PG	NE	1	x	x
White Stork	*Ciconia ciconia*	LC	LC		PG		3	x	x
Brown Snake Eagle	*Circaetus cinereus*	LC	LC		PG		4		
Black-chested Snake Eagle	*Circaetus pectoralis*	LC	LC		PG		3		

Common Name	Scientific Name	Conservation Status					LO Groothoek	VK Cluster	AOI
		Global	Regional	TOPS	FS	Endemicity			
Montagu's Harrier	*Circus pygargus*	LC	LC		PG		3		
White-necked Raven	*Corvus albicollis*	LC	LC				1	x	x
Chorister Robin-Chat	*Cossypha dichroa*	LC	LC		PG	E	4		
Forest Canary	*Crithagra scotops*	LC	LC		PG	E	1		
Black-winged Kite	*Elanus caeruleus*	LC	LC		PG		1	x	x
Sickle-winged Chat	*Emarginata sinuata*	LC	LC		PG	NE	1	x	x
Amur Falcon	*Falco amurensis*	LC	LC		PG		1	x	x
Lesser Kestrel	*Falco naumanni*	LC	LC		PG		2	x	x
Peregrine Falcon	*Falco peregrinus*	LC	LC		PG		1	x	x
Greater Kestrel	*Falco rupicoloides*	LC	LC		PG		1	x	x
Rock Kestrel	*Falco rupicolus*	LC	LC		PG		1	x	x
Eurasian Hobby	*Falco subbuteo*	LC	LC		PG		3		
African Fish Eagle	*Haliaeetus vocifer*	LC	LC		PG		1	x	x
Booted Eagle	*Hieraaetus pennatus*	LC	LC		PG		1	x	x
Black-bellied Bustard	*Lissotis melanogaster*	LC	LC		PG		3		x
Yellow-billed Kite	*Milvus aegyptius*	LC	LC		PG		1	x	x
Melodious Lark	*Mirafra cheniana*	LC	LC		PG	NE	2	x	x

Common Name	Scientific Name	Conservation Status					LO Groothoek	VK Cluster	AOI
		Global	Regional	TOPS	FS	Endemicity			
Cape Rock Thrush	*Monticola rupestris*	LC	LC		PG	E	1	x	x
African Harrier-Hawk	*Polyboroides typus*	LC	LC		PG		2	x	x
Grey-winged Francolin	*Scleroptila afra*	LC	LC		OG	E	1	x	x

Key: Pa = Project Area; AOI = Area of Influence. Status: CR = Critically Endangered; DD = Data Deficient; EN = Endangered; LC = Least Concern; NA = Not Assessed; NT = Near Threatened; OG = Ordinary Game; PG = Protected Game; PS = Protected Species; VU = Vulnerable. Likelihood of Occurrence (LO): A – anecdotal; 1 = Confirmed to occur; 2 = High; 3 = Moderate; 4 = Low / None; X = observed during SABAp2 surveys. Sources: Taylor et al. (2015); BirdLife South Africa (2016); SABAP 2 (2022).

**Only when in large murmuration flocks exceeding several hundred individuals.*

6.2.5.2 Red-listed Species

A total of 37 red-listed species are known to occur in the region based on a combination of distribution data provided by Chittenden et al. (2016), the 9 pentads covering the VWC (SABAP2, 2024) and expert knowledge. Of these, 19 species are considered highly likely to occur in the project area based on habitat suitability.. To date, 17 red-listed species have been recorded in the project area. Species which are highly likely to occur but remain undetected include Yellow-billed Stork (Mycteria ibis) and Sentinel Rock Thrush (*Monticola explorator*). Particularly noteworthy observations from the Groothoek WEF include:

- Cape Vulture (Endangered)
- Martial Eagle (Endangered)
- African Marsh Harrier (Endangered).
- Secretarybird (Endangered)
- Yellow-breasted Pipit (Vulnerable).
- Denham's Bustard (Vulnerable):
- Verreauxs' Eagle (Vulnerable).
- Southern Bald Ibis (Vulnerable)
- Lanner Falcon (Vulnerable)
- White-bellied Bustard (Vulnerable)
- Blue Korhaan (Near Threatened)
- Blue Cranes (Vulnerable)
- Amur Falcon (Least Concern).

6.2.5.3 Key Biodiversity Areas

Key Biodiversity Areas (KBAs) are sites which contribute most significantly to the global persistence of biodiversity in terrestrial, freshwater and marine ecosystems (IUCN, 2016). Both SANBI and BirdLife South Africa have recognise the importance of mapping, monitoring conserving these areas of global biodiversity importance through the implementation of the Key Biodiversity Areas Program. To date a network of 263 terrestrial KBAs have been identified and assessed against the global standard set by the IUCN. The areas will ultimately supersede IBAs as the main currency for identifying areas of high avian importance in the country. A significant portion of the eastern region of the Groothoek WEF overlaps the Eastern Free State Escarpment KBA. This KBA is recognised primarily for its importance in supporting a high diversity of threatened and range-restricted avifauna. The KBA is classified as 100% irreplaceable. This KBA envelops the Grasslands and Alexpan IBAs (KBA Partnership, 2024).Statutorily Protected Areas.

The proposed development site does not intersect any protected areas. However, the AOI intersects with seven statutorily protected areas. The most significant of which being the Upper Wilge Protected Environment championed by BirdLifeSA. The majority of the Groothoek WEF falls within an area identified by the National Protected Areas Expansion Strategy. These are not statutorily protected areas but rather areas earmarked for potential expansion of the protected areas network.

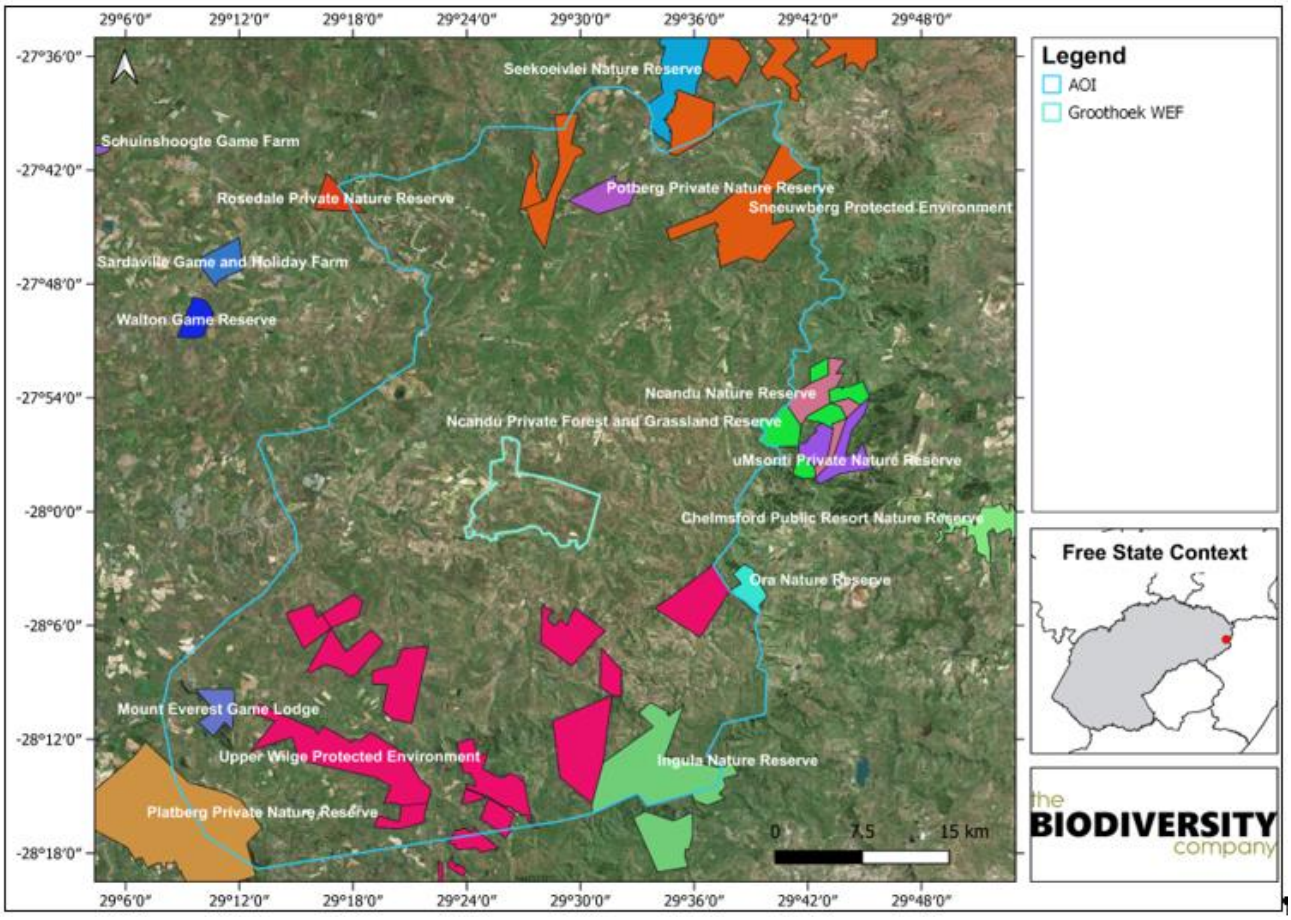

Figure 6-17 - Position of nationally protected areas in relation to the project area

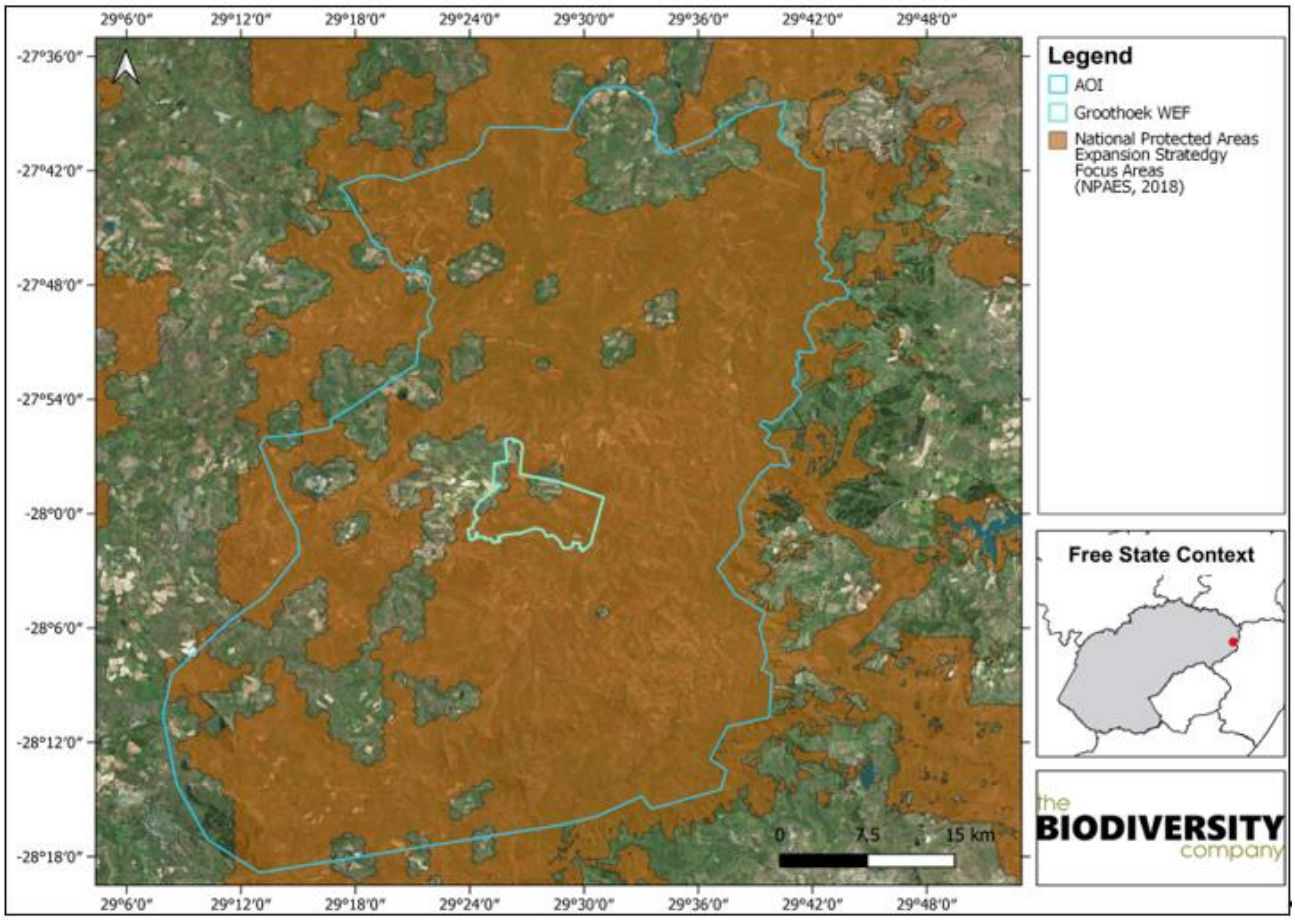

Figure 6-18 - Extent of the national protected areas expansion strategy in relation to the project area

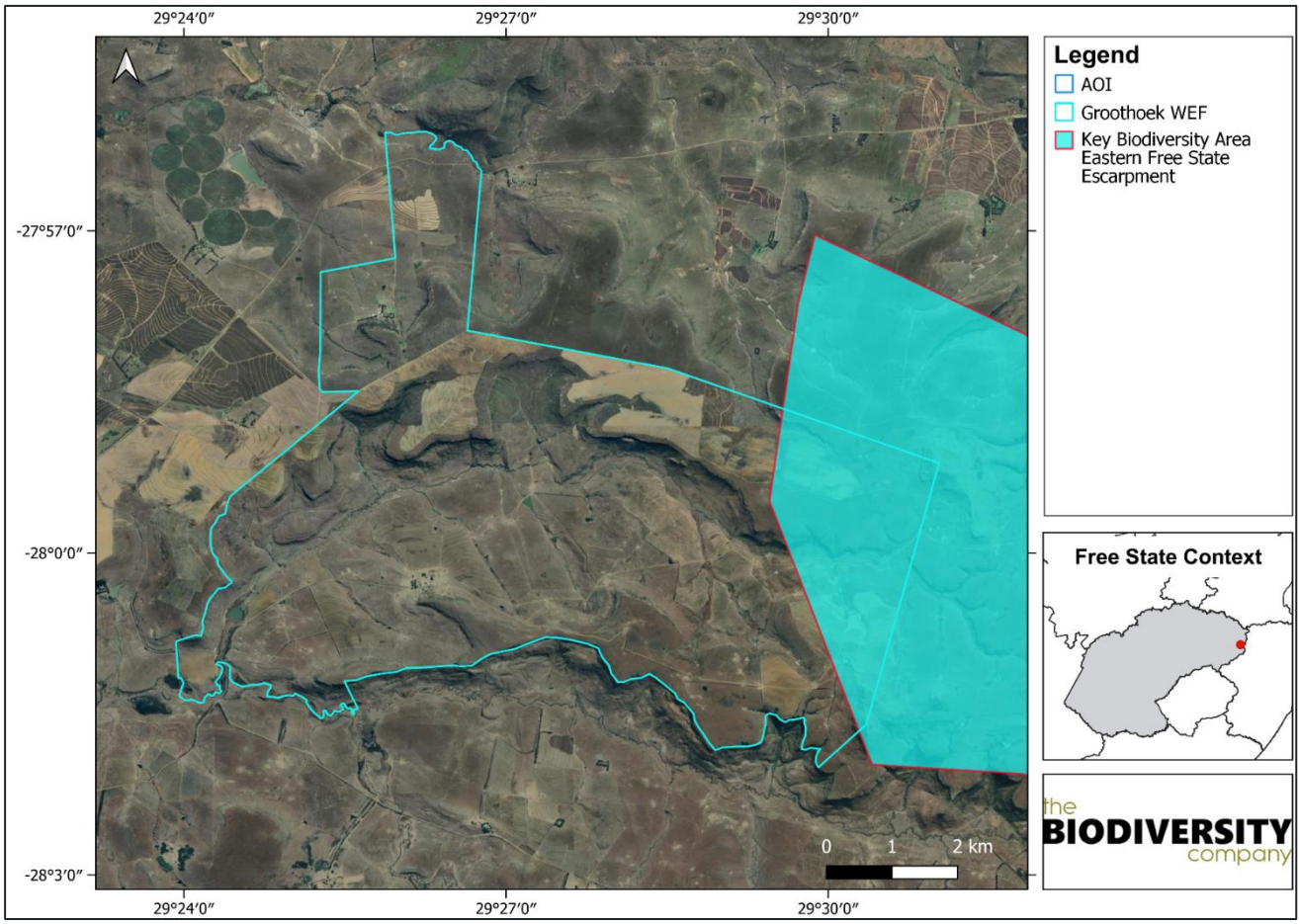

Figure 6-19 - Project area in relation to Key Biodiversity Areas

6.2.5.4 Site Sensitivity Verification and Preliminary Sensitivity Assessment

At a regional scale, the Verkykerskop WEF Cluster area is surrounded by five IBAs (within 30 km radius) including one that marginally overlaps the north-western corner of the project area (Grasslands SA020). Additionally, several well-established birding routes traverse the AOI. At a local scale the Groothoek WEF intersects 17 nest buffers of priority species which includes the 50 km High sensitivity buffer of five Cape Vulture Roosts (one of which is a breeding roost). The presence of Martial Eagle Nest 2, Southern Bald Ibis Roosts 2, 4, 6, and especially 11, Jackal Buzzard Nest 1 all have significant buffer implications for the Groothoek WEF. Additionally, the project area supports one distinct plateau grassland core habitat for Threatened high altitude species (i.e. Rudd's Lark, Yellow-breasted Pipit, Southern Bald Ibis and Denham's Bustard), one high passage rate flight corridor for priority species and an abundance of rugged terrain for threatened raptors.

Most of the high-altitude, moist, plateau grasslands within the WEF represent highly sensitive and important habitat for montane grassland endemics. These higher lying areas and particularly those closer to the Escarpment were also associated with higher Cape Vulture activity. Bearded Vulture and Wattled Crane have been observed in the AOI and some of the wetlands may provide potential habitat for White-winged Flufftail which, are known to be present in the Memel area. All three are Critically Endangered in South Africa. These findings highlight the sensitivity of the project area.

The key receptors underpinning the sensitivity map (**Figure 6-20**), the sensitivity ratings and justifications are given in **Table 6-4** below. These areas of avifaunal sensitivity within the project area spatially depicted in **Figure 6-21**.

Table 6-4 - Receptors underpinning the prescribed buffers and justification within the AOI and their Implications for Groothoek WEF

Name	Description	Buffer1[2] (m)	Buffer2[3] (m)	Buffer3[4] (m)	Justification	Buffer Implications for Groothoek WEF
African Harrier-hawk Nest 1	Active	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed.	No
African Harrier-hawk Nest 2	Status Uncertain. Presumed African Harrier-hawk	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed.	No
Bearded Vulture Nest 1	Inactive as of October 2023, new nest suspected. Only one bird observed over last two months. Status of second bird uncertain either gone or tending nest. Last known chick fledged in 2014 but requires more investigation as nest has not been comprehensive	5500	10000	0	Krueger, S & Amar, A. (2021). The Ecology and Management of a Critically Endangered Population of Bearded Vultures. Imperilled: The Encyclopedia of Conservation 10.1016/B978-0-12-821139-7.00168-9.	No

[2] Very High sensitivity, Infrastructure exclusion zone
[3] High sensitivity, turbine and other infrastructure minimisation and intensive mitigation zone
[4] High sensitivity zone applied to 50 km radial buffer on Cape Vulture roosts. Turbine mitigation zone.

Name	Description	Buffer1[2] (m)	Buffer2[3] (m)	Buffer3[4] (m)	Justification	Buffer Implications for Groothoek WEF
1Black Sparrowhawk Nest 1	Active	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed	No
1Black Sparrowhawk Nest 2	Status Uncertain	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed	No
1Black Sparrowhawk Nest 3	Uncertain	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed	No
Black Sparrowhawk Nest 4	Uncertain	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed	Yes
Black Sparrowhawk Nest 5	Uncertain	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed	No
Black Sparrowhawk Nest 6	Status Uncertain	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed	No
Black Sparrowhawk Nest 7	Status Uncertain	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed	No

Name	Description	Buffer1[2] (m)	Buffer2[3] (m)	Buffer3[4] (m)	Justification	Buffer Implications for Groothoek WEF
Black Sparrowhawk Nest 8	Status Uncertain	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed	Yes
Blue Crane Nest 1	Active. Two eggs November 2023. On ground in grassland no nest material.	150	300	0	DFFE stipulation.	No
Blue Crane Nest 2	Active. Two eggs found November 2023. Nest significant mound in permanent zone of wetland	150	300	0	DFFE stipulation.	No
Blue Crane Nest 3	Chicks hatched and moved on. Nest on ground in grassland no nest material	150	300	0	DFFE stipulation.	No
Blue Crane Nest 4	Active chicks hatched December 2023 and moved off. Nest on ground in grassland no nest material.	150	300	0	DFFE stipulation.	No
Cape Vulture Roost 1	Non-breeding Roost	0	0	50000	Cape Vulture species-specific guidelines (BLSA, 2018) for all colonies and roosts. Field Verified.	Yes
Cape Vulture Roost 2	Non-breeding Roost	0	0	50000	Cape Vulture species-specific guidelines (BLSA, 2018) for all colonies and roosts. Field Verified.	Yes

Name	Description	Buffer1[2] (m)	Buffer2[3] (m)	Buffer3[4] (m)	Justification	Buffer Implications for Groothoek WEF
Cape Vulture Roost 3	Breeding Roost one chick as of October 2023	18000	0	50000	Cape Vulture species-specific guidelines (BLSA, 2018) for all colonies and roosts. Field Verified.	Yes
Cape Vulture Roost 4	Non-breeding Roost	0	0	50000	Cape Vulture species-specific guidelines (BLSA, 2018) for all colonies and roosts. Field Verified.	Yes
Cape Vulture Roost 5	Non-breeding Roost	0	0	50000	Cape Vulture species-specific guidelines (BLSA, 2018) for all colonies and roosts. Field Verified.	Yes
Grey Crowned Crane Nest 1	Adult on nest	1000	0	0	Specialist recommendation. Endangered species.	No
Ground Woodpecker Nest 1	Confirmed nest hole	150	300	0	Specialist recommendation. Endangered species.	No
Ground Woodpecker Nest 2	Confirmed nest hole	150	300	0	Specialist recommendation. Endangered species.	No
Half-collared Kingfisher Nest 1	Active nest hole in upper Klip River catchment tended by resident pair.	1000	0	0	Pairs typically defend a 1-3 km reach of river (Chittenden et al. 2016). Threatened Species.	No
Jackal Buzzard Nest 1	Active	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed.	Yes

Name	Description	Buffer1[2] (m)	Buffer2[3] (m)	Buffer3[4] (m)	Justification	Buffer Implications for Groothoek WEF
Jackal Buzzard Nest 2	Inactive	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed.	No
Jackal Buzzard Nest 3	Active	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed.	No
Jackal Buzzard Nest 4	Status Uncertain. Presumed Jackal Buzzard Nest.	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed.	No
Lanner Falcon Nest 1	Active	1000	3000	0	Core turbine exclusion of 1000 m based on specialist recommendation and industry best practice. High sensitivity 3000 m buffer based on DFFE avian theme sensitivity.	No
Lanner Falcon Nest 2	Lanner Falcon	1000	3000	0	Core turbine exclusion of 1000 m based on specialist recommendation and industry best practice. High sensitivity 3000 m buffer based on DFFE avian theme sensitivity.	Yes
Lanner Falcon Nest 3	Active. Pothole on cliff. Two chicks tended by both adults.	1000	3000	0	Core turbine exclusion of 1000 m based on specialist recommendation and industry best practice. High sensitivity 3000 m buffer based on DFFE avian theme sensitivity.	No
Martial Eagle Nest 1	Active	5000	0	0	DFFE stipulation and Brink, R. (2020).	No

Name	Description	Buffer1[2] (m)	Buffer2[3] (m)	Buffer3[4] (m)	Justification	Buffer Implications for Groothoek WEF
Martial Eagle Nest 2	Active chick fledged October 2023	5000	0	0	DFFE stipulation and Brink, R. (2020).	Yes
Martial Eagle Nest 3	Currently Inactive as of 2024	5000	0	0	DFFE stipulation and Brink, R. (2020).	No
Martial Eagle Nest 4	Active, location approximate	5000	0	0	DFFE stipulation and Brink, R. (2020).	No
Martial Eagle Nest 5	Active	5000	0	0	DFFE stipulation and Brink, R. (2020).	No
Rock Kestrel Nest 1	Rock Kestrel	750	0	0	Specialist recommendation. Based on industry best practice. Some flexibility typically allowed.	No
Secretarybird Nest 1	Active	500	1000	0	Specialist recommendation. Based on industry best practice.	No
Southern Bald Ibis Roost 1	Uncertain. Likely breeding roost but unconfirmed	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No
Southern Bald Ibis Roost 2	Breeding roost. Inactive. Breeding confirmed but irratic	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	Yes
Southern Bald Ibis Roost 3	Non-breeding roost. No breeding observed to date.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No

Name	Description	Buffer1[2] (m)	Buffer2[3] (m)	Buffer3[4] (m)	Justification	Buffer Implications for Groothoek WEF
Southern Bald Ibis Roost 4	Non-breeding roost.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	Yes
Southern Bald Ibis Roost 5	Breeding roost. Nesting observed 2022 but not 2023.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No
Southern Bald Ibis Roost 6	Breeding roost large. Active. Breeding confirmed. At least 17 individuals. Two nests observed. Pair of chicks on one and pair of eggs on other.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	Yes
Southern Bald Ibis Roost 7	Breeding roost. Four birds observed sitting on nests. Roost monitored by Renette Steyn and Carina Nel Meissie.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No
Southern Bald Ibis Roost 8	Breeding roost. Active breeding colony, part of largest in the world	1000	5000	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No
Southern Bald Ibis Roost 9	Breeding roost. Largest in world	1000	5000	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No

Name	Description	Buffer1[2] (m)	Buffer2[3] (m)	Buffer3[4] (m)	Justification	Buffer Implications for Groothoek WEF
Southern Bald Ibis Roost 10	Breeding roost. Active. Breeding confirmed.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No
Southern Bald Ibis Roost 11	Breeding roost. Active. Breeding confirmed. One nest with two chicks.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	Yes
Southern Bald Ibis Roost 12	Breeding roost. Two nests with adults sitting and potential baby	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No
Southern Bald Ibis Roost 13	Breeding roost. One adult on nest	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	Yes
Southern Bald Ibis Roost 14	Non-breeding roost. No breeding observed to date.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No
Southern Bald Ibis Roost 15	Breeding roost. Significant Southern bald ibis roost and breeding spot - 22 birds counted	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No
Southern Bald Ibis Roost 16	Non-breeding roost. No breeding observed to date.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No

Name	Description	Buffer1[2] (m)	Buffer2[3] (m)	Buffer3[4] (m)	Justification	Buffer Implications for Groothoek WEF
Southern Bald Ibis Roost 17	Uncertain breeding status. No breeding observed to date.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No
Southern Bald Ibis Roost 18	Non-breeding roost. No breeding observed to date.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	No
Southern Bald Ibis Roost 19	Breeding Roost. Breeding erratic.	1000	2500	0	Specialist recommendation and consultation with Albert Froneman. Based on industry best practice.	Yes
Verreaux's Eagle Nest 1	Uncertain	3700	0	0	Verreauxs' Eagle species-specific guidelines (BLSA, 2017) for all nests (including alternate nests).	No
Verreaux's Eagle Nest 2	Inactive	3700	0	0	Verreauxs' Eagle species-specific guidelines (BLSA, 2017) for all nests (including alternate nests).	No
Verreaux's Eagle Nest 3	Active	3700	0	0	Verreauxs' Eagle species-specific guidelines (BLSA, 2017) for all nests (including alternate nests).	No
Verreaux's Eagle Nest 4	Inactive, but signs of recent use	3700	0	0	Verreauxs' Eagle species-specific guidelines (BLSA, 2017) for all nests (including alternate nests).	No
White-necked Raven Nest 1	Active. Adult on nest.	750	0	0	Specialist recommendation.	Yes

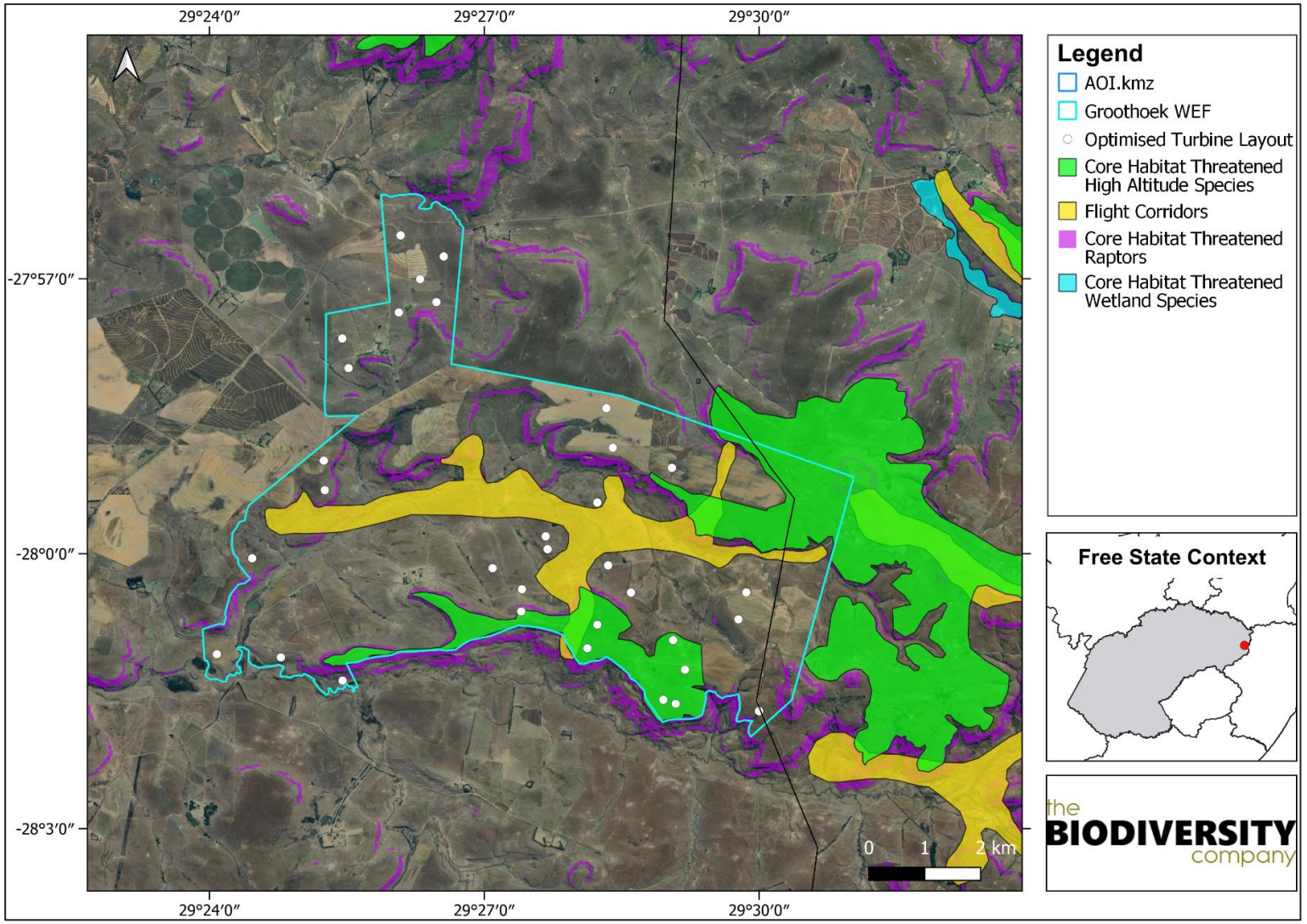

Figure 6-20 - Depicting key flight paths and core habitats for threatened high altitude, wetland and raptor species

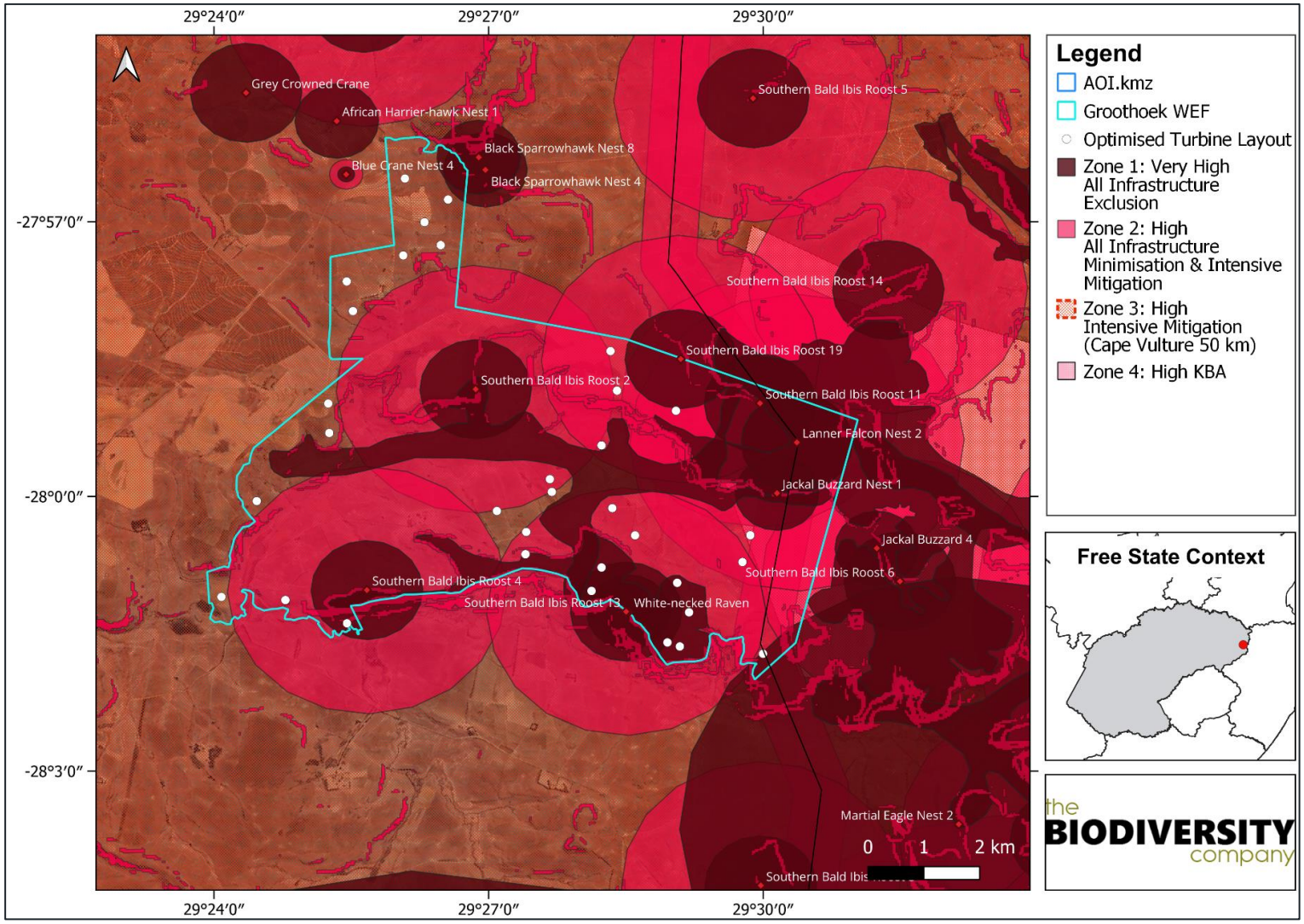

Figure 6-21 - Preliminary Avifaunal sensitivity map for Groothoek WEF

6.2.6 BATS

The following is extracted from the Bat Scoping Report compiled by Inkululeko Wildlife Services (Pty) Ltd and is included as Appendix G.8.

6.2.6.1 Potentially occurring bat species

Bat species which potentially occur in the study area are listed in **Figure 6-22**, together with their current Red List status, and turbine fatality risk (as given in MacEwan et al. 2020a). Of 14 bat species that are listed for the study area, 12 species have a High to Medium occurrence potential, and two species have a Low occurrence potential. Among the 12 species most likely to occur, five have a High fatality risk of collision with turbines, and one a Medium–High fatality risk.

The widespread but High-Risk, aerial-feeding Egyptian Free-tailed Bat (*Tadarida aegyptiaca*) and Cape Serotine (*Laephotis capensis*) and migratory Natal Long-fingered Bat (*Miniopterus natalensis*), as well as the widespread but Low-Risk Egyptian Slit-face Bat (*Nycteris thebaica*), almost certainly occur in the study area. The endemic Low-Risk Lesueur's Wing-gland Bat (*Cistugo leseueri*) was also rated with a High potential occurrence considering that this species favours broken terrain in high-altitude montane grasslands, and that there are multiple records of this species in the broader region.

The regionally common, cavity-roosting Geoffroy's Horseshoe Bat (Rhinolophus clivosus) and Temminck's Myotis (*Myotis tricolor*), and the Mauritian Tomb Bat (*Taphozous mauritianus*) were rated with a Moderate- High potential occurrence. The rare De Winton's Long-eared Bat (*Laephotis wintoni*) which also is associated with high altitude montane grasslands; was rated with a Medium–High potential occurrence. The aerial- foraging Mauritian Tomb Bat has a High fatality risk, but the other three lower-flying species have a Low fatality risk.

The Long-tailed Serotine (*Eptesicus hottentotus*), which is widely but sparsely distributed, and which requires rocky outcrops for roosting; the endemic, rare, cavity-roosting Swinny's Horseshoe Bat (*Rhinolophus swinnyi*), which is associated with Afromontane forest; and the Lesser Long-fingered Bat (*Minioptersus fraterculus*), which is endemic to South Africa and Eswatini where it inhabits montane grasslands of the escarpment, were all rated with a Medium potential occurrence.

Two fruit bat species were rated with a Low potential occurrence.

Of the 14 listed species; the following five species are regarded by IWS as Species of Conservation Concern (SCC):

- Lesueur's Wing-gland Bat: Endemic to South Africa and Lesotho. Currently not Red Listed but experiencing a global population decline (IUCN 2022-2).
- Natal Long-fingered Bat: Known to roost in large numbers (sometimes hundreds or thousands of individuals) and to migrate hundreds of kilometres (Miller-Butterworth et al. 2003; Kearney et al. 2016; MacEwan et al. 2016).
- Lesser Long-fingered Bat: Endemic to South Africa and Eswatini where the core of its distribution is in the montane grasslands of the escarpment. Cave-dependent and migratory; this species congregates in far smaller numbers than the Natal Long-fingered Bat (Monadjem *et a*l. 2020).

- Swinny's Horseshoe Bat: A rare species endemic to South Africa, where it appears to be associated with temperate Afromontane forest (Monadjem *et al*. 2020).
- African Straw-coloured Fruit Bat: Globally and nationally Near Threatened. Known to roost in large numbers and migrate hundreds of kilometres (Monadjem *et al*. 2020). Records in the study region are most likely representative of vagrant individuals, however.

Of these, the Natal Long-fingered Bat has a High occurrence potential and a High fatality risk, and the Lesser Long-fingered Bat has a Medium occurrence potential and a High fatality risk. Lesueur's Wing-gland Bat has a High occurrence potential but Low fatality risk and the two remaining SCC have a Low occurrence potential or Low fatality risk.

The nearest known major bat roost is ~103 km north-east of the Verkykerskop WEF site, in old mine tunnels referred to as Yzermyn. Here, sizeable populations of the migratory Natal Long-fingered Bat, Geoffroy's Horseshoe Bat, Temminck's Myotis (*Myotis tricolor*), and the regionally Vulnerable (Child *et al.* 2016) Swinny's Horseshoe Bat (Rhinolophus swinnyi) have been recorded (NSS 2013). Given the distance from the Yzermyn tunnels, the proposed Verkykerskop WEF Cluster is not expected to have a major impact on bats from that roost site.

FAMILY	SPECIES	COMMON NAME	OCCURRENCE POTENTIAL[1,2,3,4]	RED LIST STATUS		SPECIES OF CONSERVATION CONCERN[2,5]	TURBINE FATALITY RISK[7]
				Global[5]	Regional[6]		
MOLOSSIDAE	*Tadarida aegyptiaca*	Egyptian Free-tailed Bat	High	LC (U)	LC	-	High
VESPERTILIONIDAE	*Laephotis capensis*	Cape Serotine	High	LC (S)	LC	-	High
MINIOPTERIDAE	*Miniopterus natalensis*	Natal Long-fingered Bat	High	LC (U)	LC	Migratory	High
NYCTERIDAE	*Nycteris thebaica*	Egyptian Slit-faced Bat	High	LC (U)	LC	-	Low
VESPERTILIONIDAE	*Cistugo lesueuri*	Lesueur's Wing-gland Bat	High	LC (D)	LC	Near-endemic	Low
EMBALLONURIDAE	*Taphozous mauritianus*	Mauritian Tomb Bat	Medium–High	LC (U)	LC	-	High
VESPERTILIONIDAE	*Myotis tricolor*	Temminck's Myotis	Medium–High	LC (U)	LC	Migratory	Medium–High
RHINOLOPHIDAE	*Rhinolophus acrotis*	Geoffroy's Horseshoe Bat	Medium–High	LC (U)	LC	-	Low
VESPERTILIONIDAE	*Laephotis wintoni*	De Winton's Long-eared Bat	Medium–High	LC (U)	VU	-	Low
MINIOPTERIDAE	*Miniopterus fraterculus*	Lesser Long-fingered Bat	Medium	LC (U)	LC	Near-endemic; Migratory	High
VESPERTILIONIDAE	*Cnephaeus hottentotus*	Long-tailed Serotine	Medium	LC (U)	LC	-	Medium
RHINOLOPHIDAE	*Rhinolophus swinnyi*	Swinnys' Horseshoe Bat	Medium	LC (D)	VU	Endemic	Low
PTEROPODIDAE	*Epomophorus wahlbergi*	Wahlberg's Epauletted Fruit Bat	Low	LC (S)	LC	-	High
PTEROPODIDAE	*Eidolon helvum*	African Straw-coloured Fruit Bat	Low	NT (D)	LC	Migratory	High

Status: D: Decreasing; EN: Endangered; LC: Least Concern; NT: Near Threatened; S: Stable; U: Unknown; VU: Vulnerable.

Source: [1]Monadjem *et al.* (2020); [2]African Chiroptera Report (2022); [3]FIAO (2023); [4]IWS (unpubl. data); [5]IUCN (2024-1); [6]Child *et al.* (2016); [7]MacEwan *et al.* (2020a)

Figure 6-22 - Potentially occurring bat species in the proposed Verkykerskop wind farm cluster site

6.2.6.2 Preliminary Bat Sensitivity Mapping

- High Bat Sensitive Areas include:
  - Confirmed roosts with a 500 m buffer around these, based on evidence of bat roosting activity and suitable roosting habitat for certain cavity/roof-roosting bat species in identified buildings onsite, and the minimum 500 m buffer recommendation in the MacEwan et al. (2020a) guidelines for a small roost of Least Concern bats and/or Low fatality risk bats.
  - Potential roosts with a 200 m buffer around these, based on the possibility that occupied and abandoned dwellings may provide suitable roosting habitat for certain cavity/roof-

roosting bat species, and the minimum 200 m buffer recommendation in the MacEwan et al. (2020a) guidelines for any potentially important bat features.

- Significant natural rocky terrain including cliff faces, overhangs, cavities, crevices, and/or exfoliating rock, and a 200 m buffer extending downslope from these, based on: i) the possibility that these may provide roosting habitat for the cave-, cavity-, and crevice-roosting bat species that have been listed for the study area; ii) the minimum 200 m buffer recommendation in the MacEwan et al. (2020a) guidelines for any potentially important bat features; and iii) the generally higher levels of bat activity recorded by IWS at monitoring stations at lower elevations, compared to those at higher elevations.
- Natural and artificial hydrological features including rivers, dams, pans, and certain herbaceous wetlands, and a 500 m buffer around the large dam and river onsite, and 200 m buffer around all other hydrological features, based on: i) the known importance of surface water resources for bats (Serra-Cobo et al. 2000; Akasaka *et al*. 2009; Hagen and Sabo 2012; Sirami *et al*. 2013); ii) the minimum 200 m buffer recommendation in the best practice guidelines by MacEwan et al. (2020a) for known and potential bat important features; and iii) the recorded high activity of bats at monitoring stations VK5 and VK6 and the anticipated high activity of bats at the dam and along the river between these two locations.

- Medium–High Bat Sensitive Areas include:
  - Patches of indigenous and exotic woody vegetation, based on the known importance of trees for clutter and clutter-edge foraging, tree-roosting, and fruit-eating bat species. Dense stands of woody vegetation were assigned a 200 m buffer, based on the minimum 200 m buffer recommendation in the best practice guidelines by MacEwan et al. (2020a) for known and potential bat important features.
- Medium Bat Sensitive Areas include:
  - The locations of two bat monitoring stations (VK5 and VK6) and a 2.5 km buffer around each of these, where possible cave roosts are suspected based on the high levels of activity of certain cavity- and crevice-roosting bat species that were recorded at these two stations.
- Remaining areas have Low sensitivity

In addition to the identified local sensitivities, according to the spatial data and other information sources that were consulted by IWS, seven protected areas are situated within only 10 km of the proposed Verkykerskop WEF Cluster site (**Figure 6-25**). Of these, the nearest include: the Upper Wilge National Protected Environment, which comprises a collection of land parcels located near the southern tip and up to 30 km south-west of the site; the Ncandu Private Forest and Grassland Reserve ca. 1.6 km to the east; Ncandu Nature Reserve ca. 5 km north-east; Normandien Protected Environment located ca. 4 km and up to 20 km to the south-east; Ora Nature Reserve ca. 5 km to the south-east; Kiepersol Protected Environment ca. 9 km to the north-east; and uMsonti Private Nature Reserve ca. 6 km to the east. Many other formal and informal protected and conservation areas occur within a 50 km radius of the Cluster site (**Table 8-2**).

Bats which should be conserved within these protected areas could potentially be impacted in various ways by the proposed Verkykerskop WEF Cluster and, therefore, a 0-2.5 km High and 2.5-5 km Medium sensitivity buffer has been assigned around each of the seven closest

protected areas (**Figure 6-26**) based on the minimum buffer recommendations in the MacEwan et al. (2020a) guidelines of, respectively, 2.5 km for a large roost of Least Concern bats and/or Low fatality risk bats and/or a medium roost for a Species of Conservation Concern (SCC) with a Medium, Medium-High or High turbine fatality risk, and 5 km for a large roost of a SCC with a Low fatality risk.

The sensitivity mapping should be interpreted as follows:

- High Bat Sensitive Areas are No-Go areas for turbines and other non-linear infrastructure viz. substations, buildings, construction camps, laydown areas, and possible quarries (to avoid disturbing key bat roosting, foraging, and/or commuting habitat, and to avoid high bat fatalities in these areas where high bat activity is anticipated).
- Medium-High Bat Sensitive Areas represent No-Go areas for turbine towers but which may be encroached by turbine blades and other infrastructure (to prevent turbines from spinning directly over cliff faces and/or woody vegetation where bats may roost and/or where high bat activity is anticipated).
- Medium Bat Sensitive Areas will require bat fatality mitigation (as prescribed in the IWS Bat Monitoring and Impact Assessment Report for each WEF).
- In remaining Low Bat Sensitive Areas, impacts such as light pollution, should be minimized.

Detailed bat impact mitigation recommendations will be provided in the Bat Monitoring and Impact Assessment Report for each WEF, and will depend, inter alia, on the pre-construction monitoring results, the layout and infrastructure details of each proposed WEF, and the latest relevant scientific research and best practice requirements.

LANDSCAPE FEATURES			BUFFER	
Type	**Name**	**Sensitivity**	**Sensitivity**	**Size**
Building	Confirmed roost	HIGH	HIGH	500 m
Building	Potential roost	HIGH	HIGH	200 m
Natural Waterbodies	River with large dam	HIGH	HIGH	500 m
Natural Waterbodies	Streams and smaller drainage lines	HIGH	HIGH	200 m
Natural Waterbodies	Wetlands (mostly with open water)	HIGH	HIGH	200 m
Artificial Waterbodies	Dams	HIGH	HIGH	200 m
Rocky Terrain	Cliff faces, overhangs, cavities, crevices, etc.	HIGH	HIGH on *downslope* only	200 m
Wooded Areas	Tree clumps	MEDIUM–HIGH	MEDIUM–HIGH	200 m
Bat Stations	VK5 and VK6	N.a.	MEDIUM	2.5 km
NEARBY PROTECTED AREAS			**BUFFER**	
Type	**Name**	**Sensitivity**	**Sensitivity**	**Size**
Protected Environment	Upper Wilge Protected Environment	HIGH	HIGH	2.5 km
			MEDIUM	2.5-5 km
Forest Nature Reserve	Ncandu Private Forest and Grassland Reserve	HIGH	HIGH	2.5 km
			MEDIUM	2.5-5 km
Nature Reserve	Ncandu Nature Reserve	HIGH	HIGH	2.5 km
			MEDIUM	2.5-5 km
Nature Reserve	uMsonti Private Nature Reserve	HIGH	HIGH	2.5 km
			MEDIUM	2.5-5 km
Protected Environment	Kiepersol Protected Environment	HIGH	HIGH	2.5 km
			MEDIUM	2.5-5 km
Nature Reserve	Ora Nature Reserve	HIGH	HIGH	2.5 km
			MEDIUM	2.5-5 km
Protected Environment	Normandien Protected Environment	HIGH	HIGH	2.5 km
			MEDIUM	2.5-5 km

Figure 6-23 - Sensitivity and buffering of local bat important features, and nearby protected areas

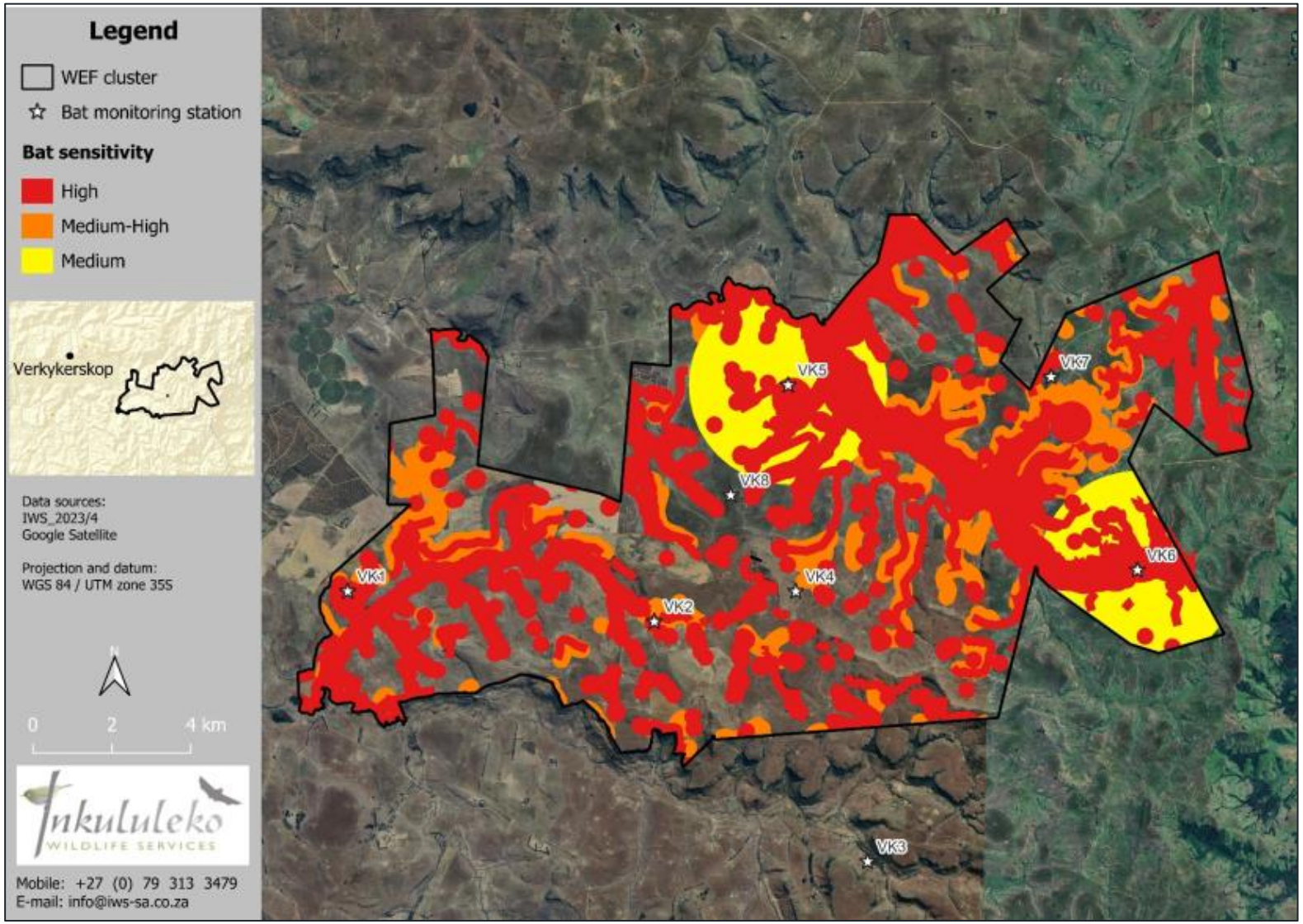

Figure 6-24 - Bat sensitivity map for the proposed Verkykerskop WEF cluster site – excluding the buffers around nearby protected areas

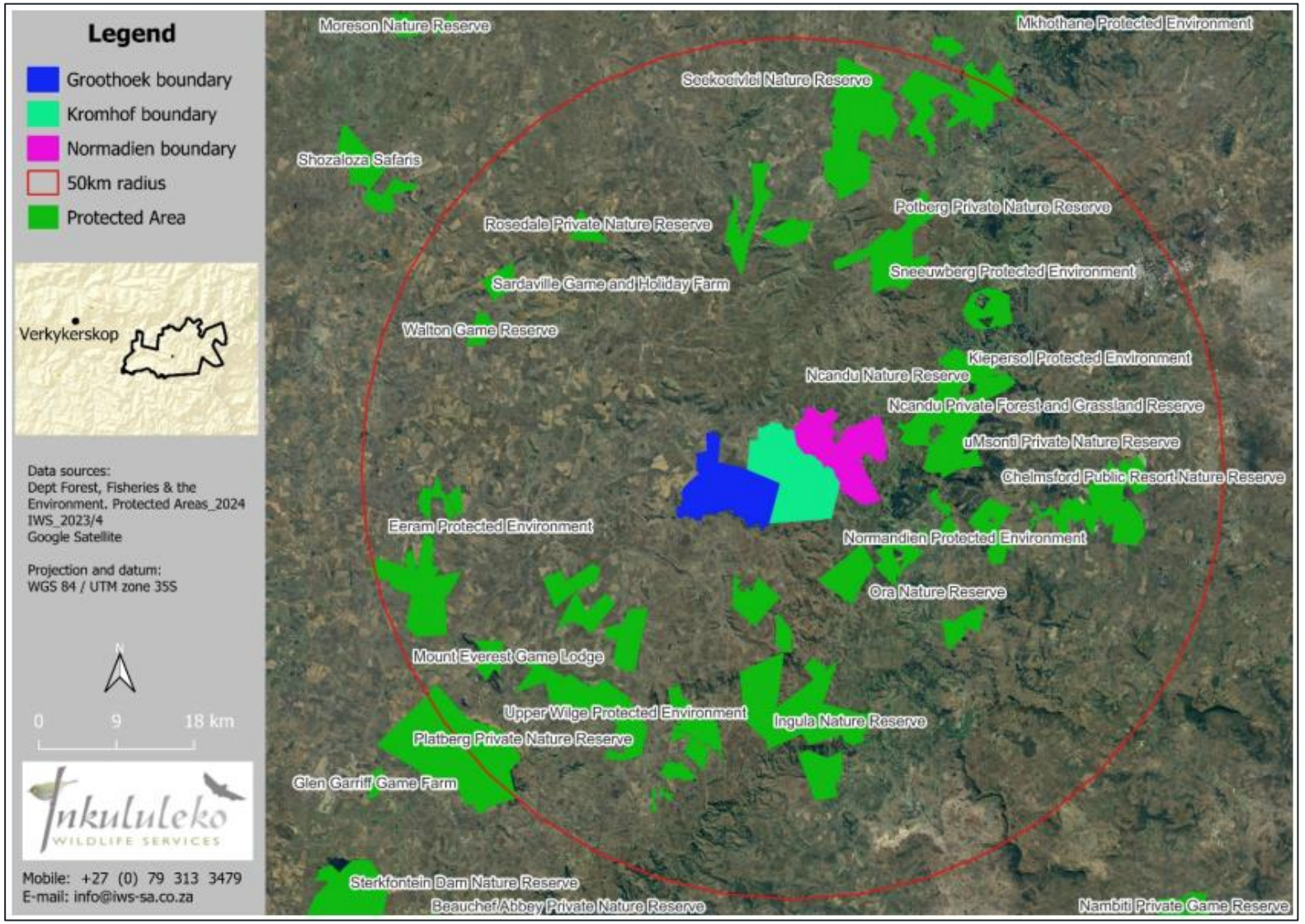

Figure 6-25 - Protected areas situated within 50 km (red outline) of the proposed Verkykerskop WEF cluster site

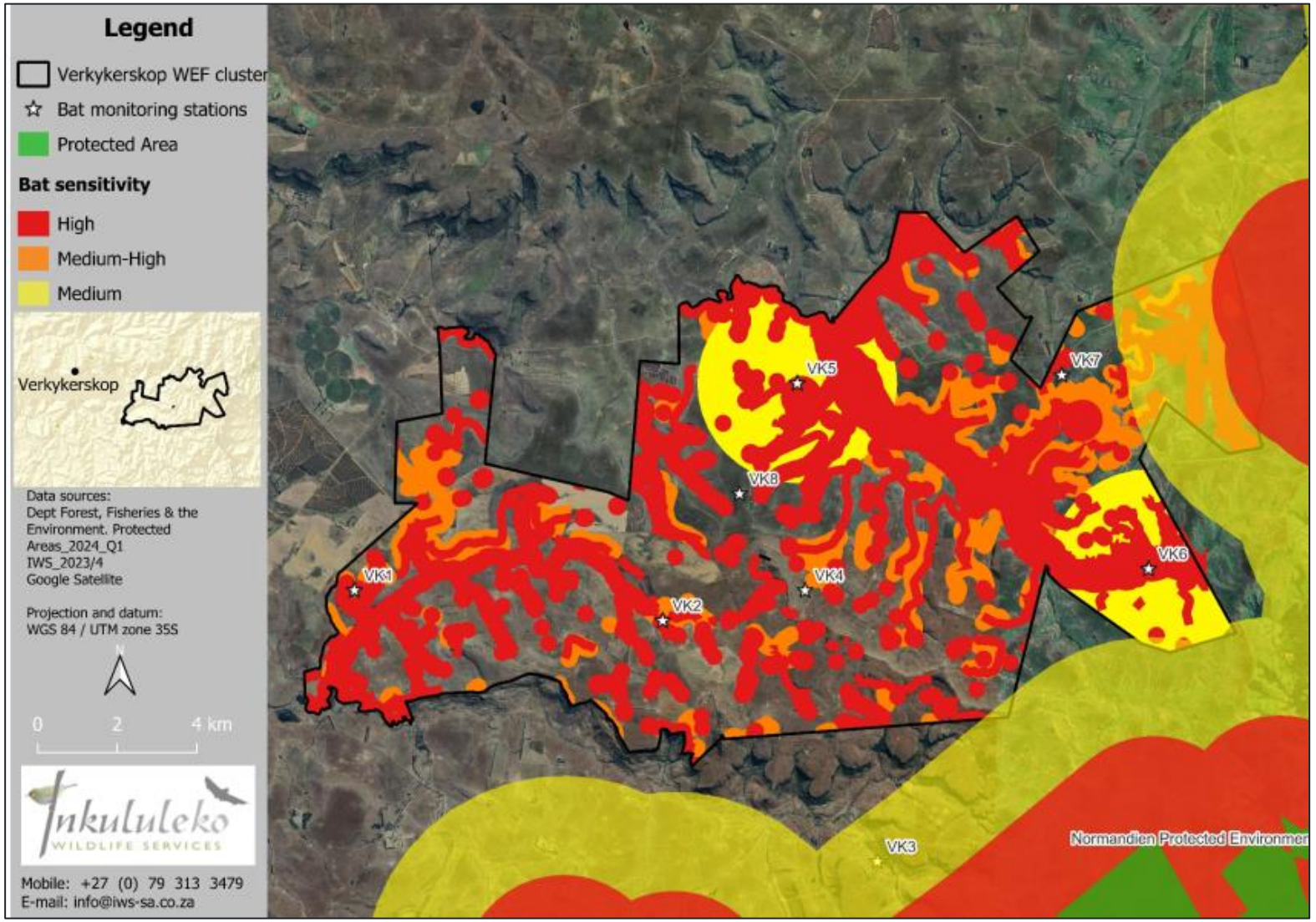

Figure 6-26 - Buffers around nearby protected areas, in relation to the proposed Verkykerskop WEF cluster site

6.3 SOCIAL AND ECONOMIC ENVIRONMENT

The social baseline describes the social profile of the project-affected area based on desktop research. The regional, district and local context describes the geographical setting of the project. The demography of the project-affected area is provided and its leadership structures.

6.3.1 ARCHAEOLOGICAL AND CULTURAL HERITAGE

The following is extracted from the Heritage Scoping Report compiled by Beyond Heritage and is included as Appendix G.10.

The archaeological record for the greater study area consists of the Stone Age, Iron Age and Historical Period.

6.3.1.1 Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resource Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases. Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable. The three main phases can be divided as follows;

- Later Stone Age (LSA); associated with Khoi and San societies and their immediate predecessors. - Recently to ~30 thousand years ago.
- Middle Stone Age (MSA); associated with Homo sapiens and archaic modern human - . 30-300 thousand years ago.
- Earlier Stone Age (ESA); associated with early Homo groups such as Homo habilis and Homo erectus. - 400 000-> 2 million years ago.

The Stone Age within the southern Highveld is largely represented through sparse surface scatters of Middle and Later Stone Age lithics. These scatters are often found along the erosion gullies of rivers and streams. Early Stone Age Acheulian hand axes have been recorded further north of Verkykerskop (Rossouw 2013). Although no prominent Stone Age sites are present near the Project area, some surveys in the larger area have recorded rock art (Becker 2015, Dreyer 2007), indicating the movement of LSA people through this landscape.

6.3.1.2 Iron Age

No Sites dating to the Early or Middle Iron Age have been recorded or is expected for the study area. The landscape only saw extensive Iron Age occupation from the Late Iron Age (LIA) as a result of extensive research conducted on LIA sites within the Free State (Maggs 1976).

The Project area falls geographically within the outer region of LIA occupation settlement sites referred to as Type V and Type N sites (Maggs 1976). Type V sites consist of a ring of enclosures which are then connected by stonewalling and creates a ring of connected enclosures within a larger enclosure (Maggs 1976). Settlement Type V consists of the standard core of cattle enclosures surrounded by beehive houses and grain bins, but outer walls are usually absent. Corbelled huts

have been associated with this type. As the geographical layout of Type N and Type V overlap, it was seen that some Type N settlements were reoccupied and altered into the Type V sites. The main difference being that Type V does not have an outer wall enclosure as Type N does. Type V sites are dated to the 16th and 17th centuries.

The larger area is known to have been occupied by Batlokwa and Basia people, with a memorial stone which commemorates the burial sites of at least eight Batlokwa chiefs situated near Verkykerskop on the farm Morgenlicht 869 (Dreyer 1999). The Batlokwa and Basia occupied the area until the Mfecane when they were displaced from the landscape.

During the mid-17th century Europeans started to settle in modern-day Cape Town. During and after the conflict caused by the Mfecane (1820-1840), during the reign of king kaSenzangakhona Zulu, known as Shaka, Dutch-speaking farmers started to migrate to the interior regions of South Africa. This is a period that is marked by various skirmishes and battles between the local inhabitants, Dutch settlers and the British (Giliomee & Mbenga 2007).

6.3.1.3 Historical context of Verkykerskop

Verkykerskop is a village which was established on the farm Aansluit. The village was named after a large hill nearby from which one could see the landscape The name means ‘spy hill’ (Raper 2004). It is however argued which hill is the exact Verkykerskop hill. Many of the original homesteads in Verkykerskop have been altered into tourist accommodation buildings.

6.3.1.4 Battlefields and war history

The Basotho Wars which took place between 1858 and 1868 greatly affected the town of Harrismith whereby there was conflict between the Basotho people and white settlers regarding the boundaries and ownership of lands. In 1869, the conflict came to a conclusion when the Convention of Aliwal-North was used to formally draw the boundaries of present-day Lesotho.

During the Anglo Boer War (1899-1902), Harrismith was the setting for much conflict. On the 4th August 1900, Harrismith was surrendered to the British forces and the British camped near Basuto Hill. The British proceeded to build lines of blockhouses which would link Harrismith to Oliviershoek Pass and Kroonstad. This was done in an attempt to block Boer troops and make it possible to catch Boer soldiers. After the end of the war, the British remained in Harrismith until the outbreak of World War One (samilitaryhistoyr.org).

6.3.1.5 Graves and Burial sites

No known cemeteries are situated in the study area.

6.3.1.6 Cultural Landscape

The area is largely undeveloped and has areas which are cultivated and form part of farmlands. Development in the study area is limited to farming infrastructure such as access roads, fences, and agricultural developments, and farmsteads/homesteads.

6.3.1.7 Sensitive Areas

Based on areal imagery and a desktop assessment the study area includes heritage sensitive areas that specifically relate to historical occupation of the Project area and potential associated burial sites (**Figure 6-27**). Features visible on areal imagery were overlain on the map showing possible sensitivities. A Site Sensitivity Verification based on the DFFE Screening tool is included as

Appendix A of the Heritage Scoping Report. Based on the current information obtained for the area at a desktop level, it is anticipated that apart from the burial sites, any other heritage resources that occur within the development areas could have a Generally Protected B (GP. B) or lower field rating and should be mitigatable. Graves are of high social significance (Field rating GP A) and should preferably be preserved *in situ*.

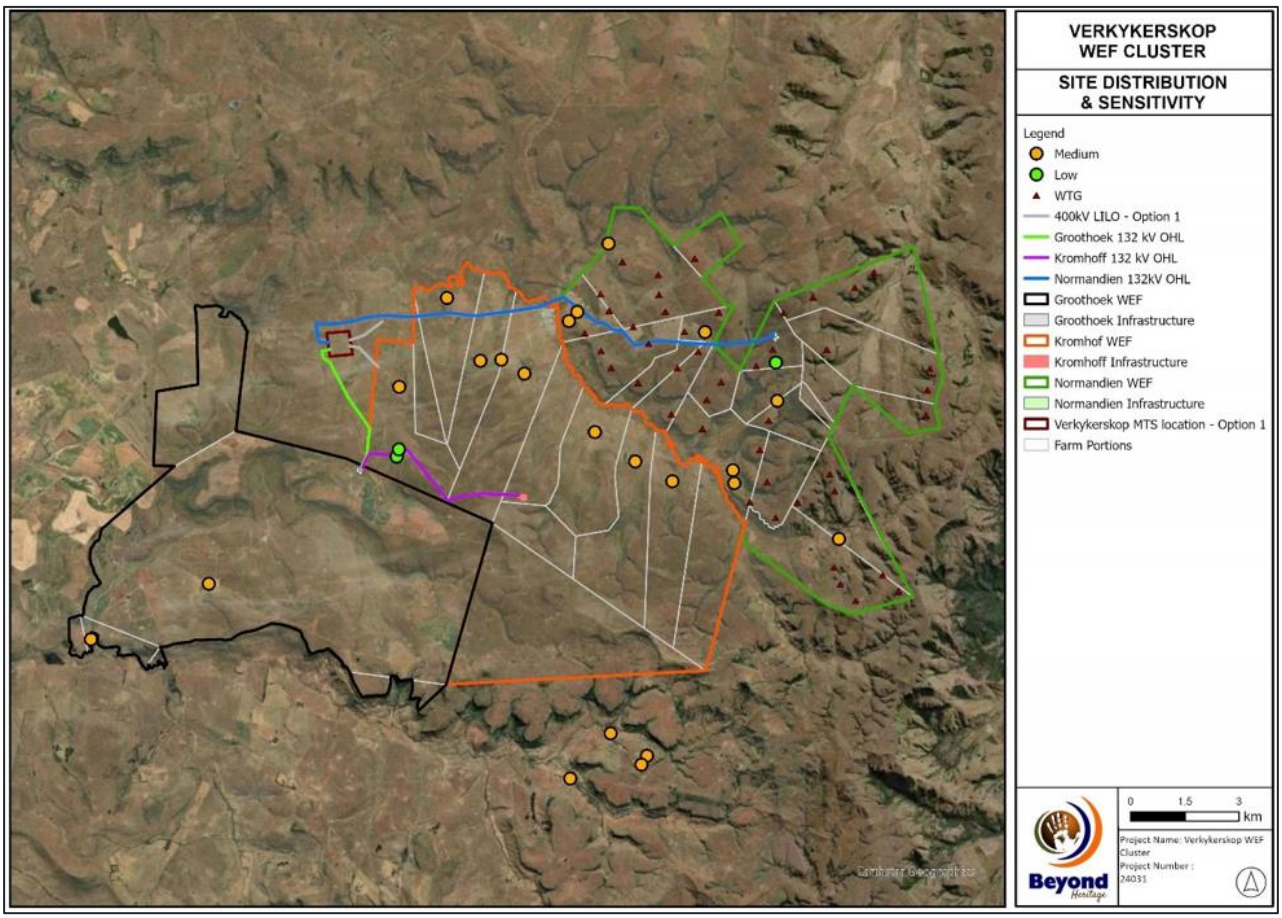

Figure 6-27 - Heritage potential and possible heritage sensitivities in the Project Area. Areas of medium significance are indicated the Groothoek WEF impact area

6.3.1.8 Palaeontology

The study area is of insignificant, moderate, and very high paleontological sensitivity and further studies will be required in the EIA phase. An independent study will have to be conducted for this project in the EIA phase.

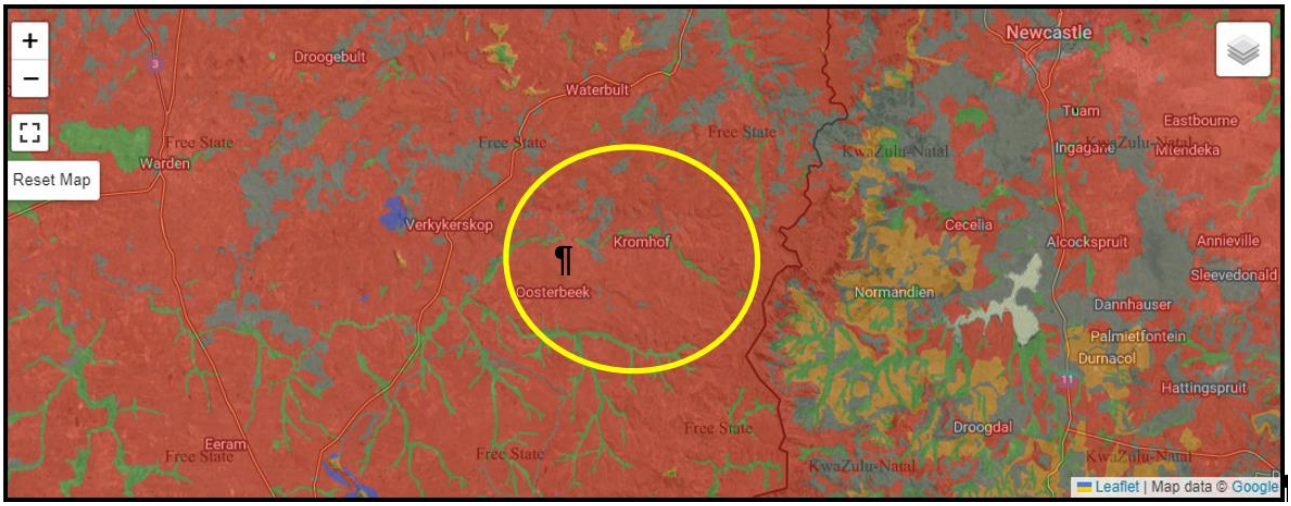

Figure 6-28 - Palaeontological sensitivity map of the approximate study areas (yellow polygon)

Table 6-5 – Sensitivity Status

Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study; a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

6.3.2 TRAFFIC

The following is extracted from the Traffic Impact Scoping Report compiled by iWink Consulting and included as Appendix G.9.

6.3.2.1 Route for Components manufactured within South Africa

In South Africa, the majority of the manufacturing industry's national workforce resides in four metros Johannesburg, Cape Town, Gqeberha and eThekwini. It is therefore anticipated that elements that can be manufactured within South Africa will be transported to the site from the Cape Town, Johannesburg, Gqeberha or Pinetown/Durban areas. Components will be transported to site using appropriate National and Provincial routes. It is expected that the components will generally be transported to site with normal heavy load vehicles.

6.3.2.2 Route from Cape Town Area to Site – Locally sourced materials and equipment

Cape Town has a large manufacturing sector with industrial areas located throughout the metro. The proposed industrial hubs being considered to source the required materials and components is currently unknown. With quite an extensive and widespread industrial market, a specific route to the site cannot be considered at this point in time, but it is expected that a majority of the route length will be similar to the routes considered for the haulage of imported materials and equipment. No road limitations envisaged along the route for normal load freight. Several routes are available and one possible route is shown in **Figure 6-29** via the N1 with a travel distance of approximately 1 390km.

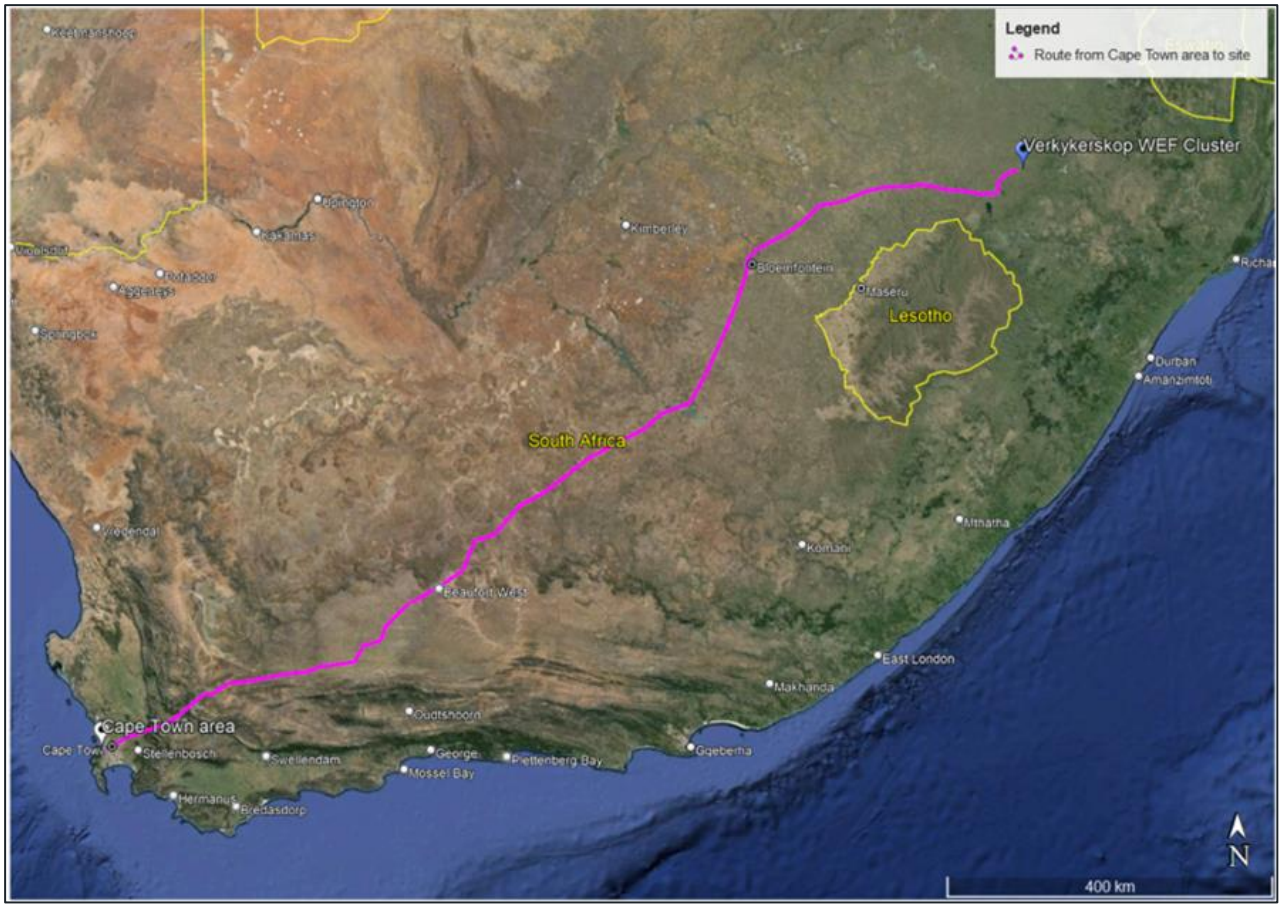

Figure 6-29 - Route from Cape Town area to the proposed Verkykerskop WEF Cluster

6.3.2.3 Route from Johannesburg Area to Site – Locally sourced materials and equipment

If components from Johannesburg are considered, normal loads from Johannesburg to the site can be transported via several routes of which one is shown in **Figure 6-30**. No road limitations are envisaged along the route for normal load freight. The travel distance from the Johannesburg area to the site is approximately 300 km via the N3.

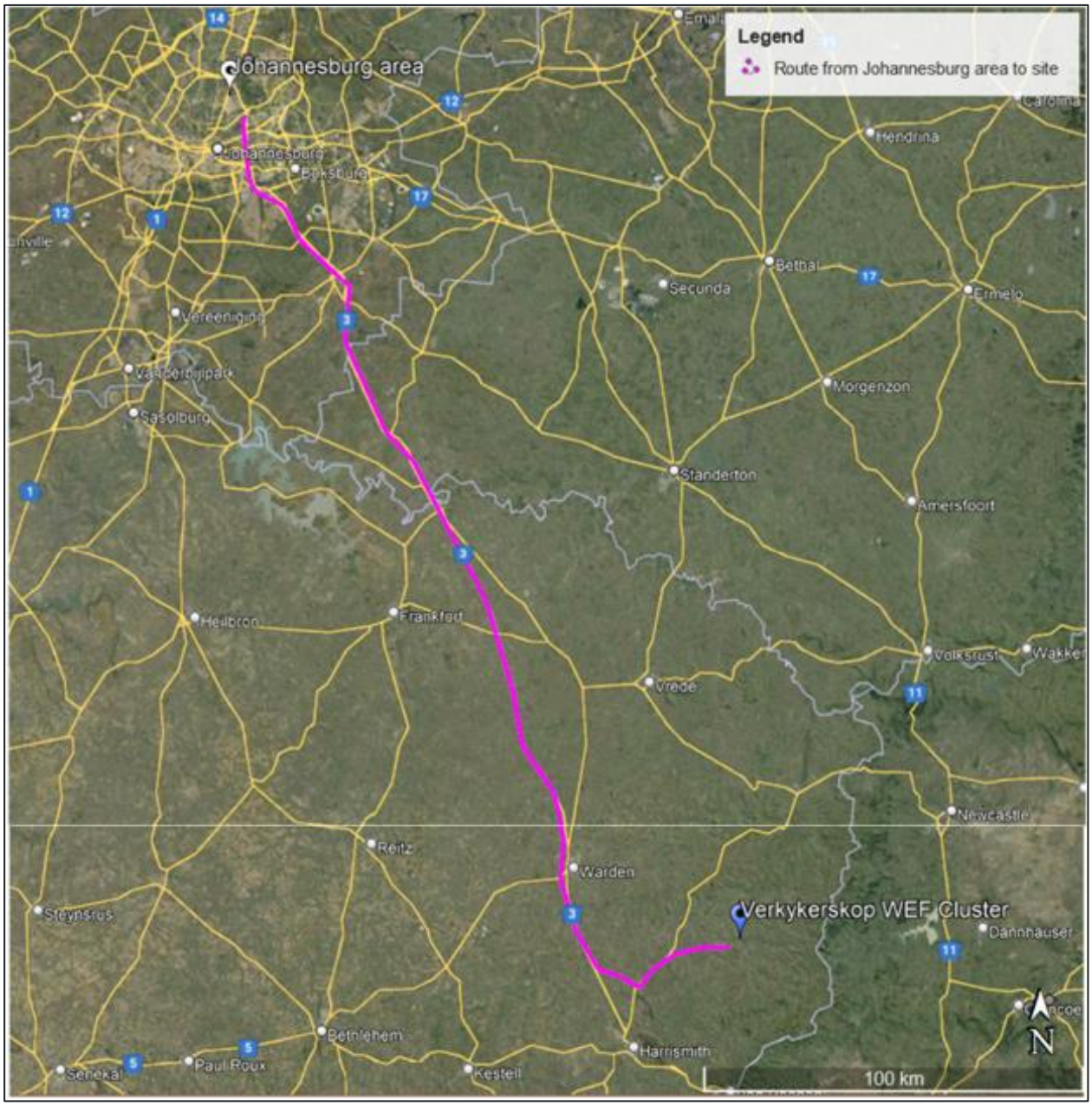

Figure 6-30 - Route from Johannesburg Area to the proposed Verkykerskop WEF Cluster

6.3.2.4 Route from Gqeberha area to Site - Locally sourced materials and equipment

If loads are transported from the Gqeberha area to site, several routes to site are available. One potential route is shown in **Figure 6-31** via the R75, N9, N1 and N5 with a travel distance of approximately 1 050km.

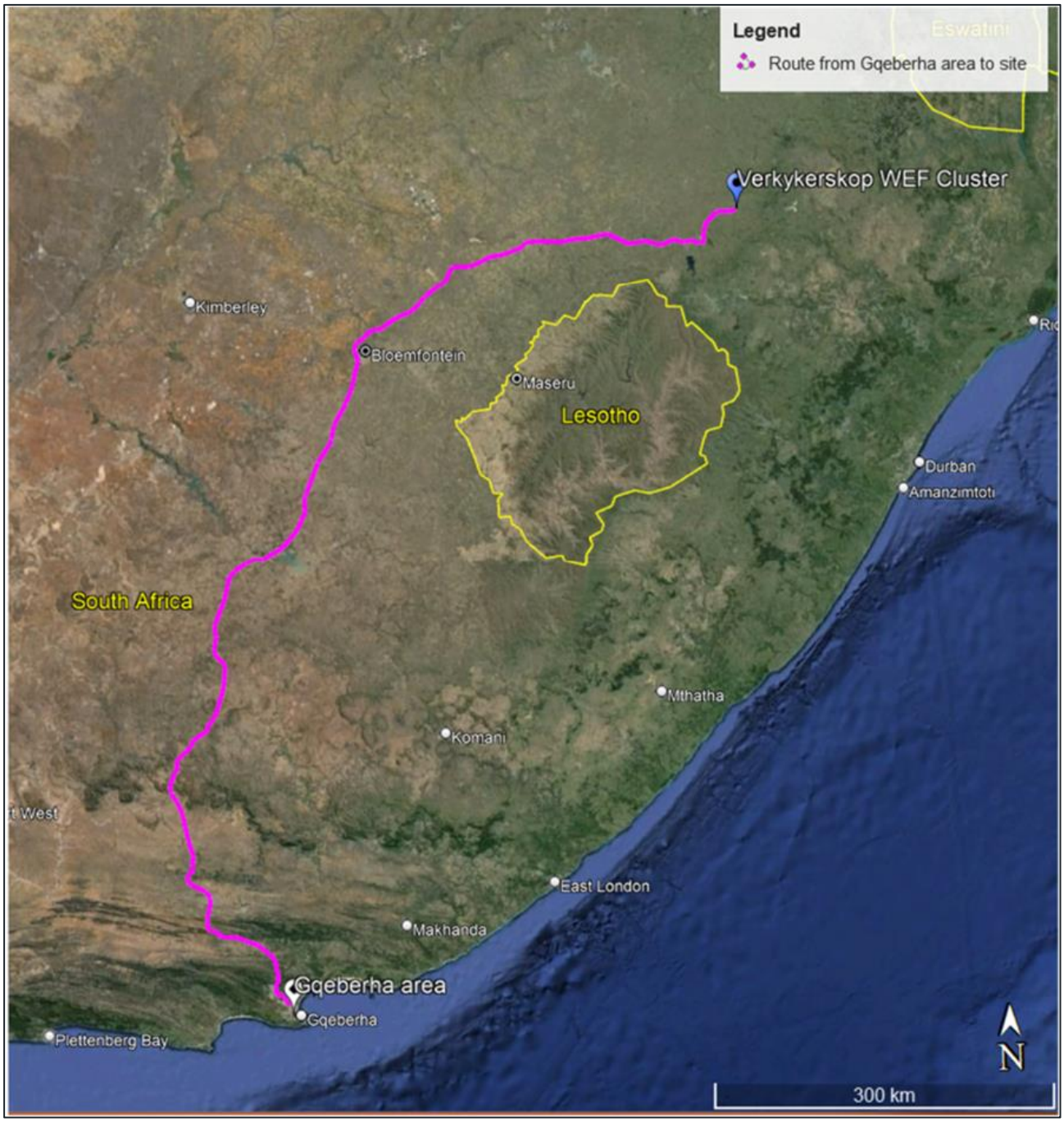

Figure 6-31 - Route from Gqeberha area to proposed Verkykerskop WEF Cluster

6.3.2.5 Route from Pinetown / Durban to Site - Locally sourced materials and equipment

Normal loads can transport elements via two potential routes from Durban and Pinetown to the site. No road limitations are envisaged along the route for normal load freight. The shortest distance from Pinetown to the site is approximately 300 km via the N3 (see **Figure 6-32**).

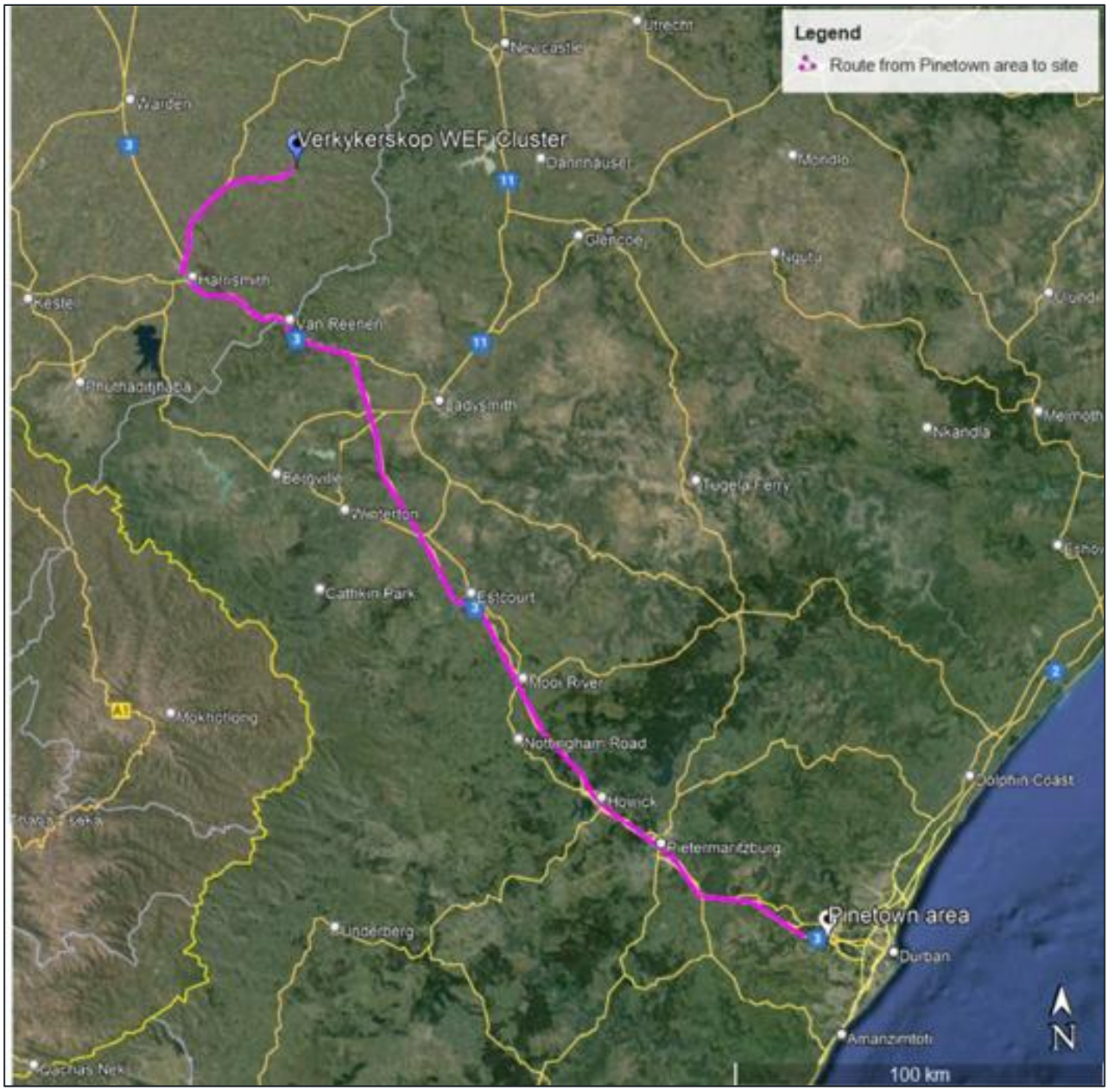

Figure 6-32: Route from Pinetown to the proposed Verkykerskop WEF Cluster

6.3.2.6 Surrounding road network

The construction vehicles for the proposed Groothoek WEF project can take access via the R722, which runs past the project site in approximately 13 km distance to the west of the site.

The R722 is a regional route that connects Memel with Harrismith with a total length of approximately 85km. According to the road classification of the surrounding road network as per COTO's TRH26 South African Road Classification and Access Management Manual, the R722 can be classified as Class 3 rural minor arterial, which typically carries inter-district traffic between:

- Small towns, villages and larger rural settlements (population typically less than about 25000);

- Smaller commercial areas and transport nodes of local importance that generate relatively high volumes of freight and other traffic in the district (public transport and freight terminals, railway sidings, small seaports and landing strips);
- Very small or minor border posts;
- Tourist destinations;
- Other Class 1, 2 and 3 routes.
- Smaller centres than the above when travel distances are relatively long (longer than 50 to 100 km).

6.3.2.7 Proposed Accesses

Feasible accessibility was established in consideration with required sight distances, minimum access spacing requirements and road safety principles. It needs to be noted that the access points discussed in this report are recommended from a traffic engineering and transport planning point of view only and do not factor in landownership or other considerations.

Figure 6-33 shows an overview of the proposed turbine locations for the entire Verkykerskop WEF Cluster including existing farm roads that can be used and proposed new roads that need to be built.

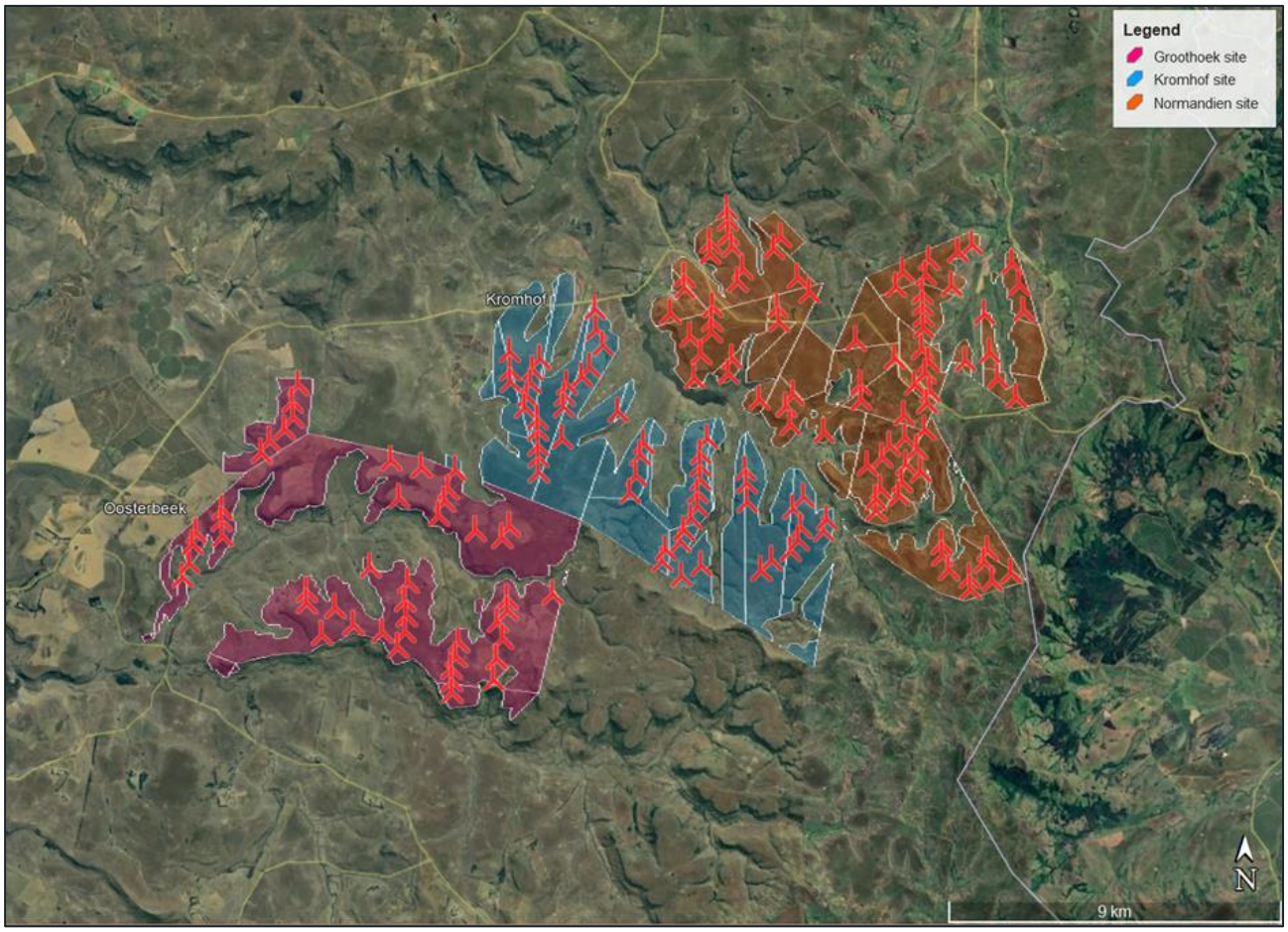

Figure 6-33: Aerial Overview of Preliminary Turbine locations and roads for the Verkykerskop WEF Cluster

The **Figure 6-33** assisted in the assessment of possible access routes from the external road network to the site as it was used to achieve connectivity of recommended access routes and site roads.

There are a number of public roads towards the site available, of which the following two access routes are recommended for the Groothoek WEF (**Figure 6-34**):

- Access route 1 (blue): from R722 onto S795 for approximately 13 km before turning left into the S18 towards the site (**Figure 6-35**); and
- Access route 2 (green): from R722 onto S18 and then S798 towards the site **Figure 6-36**).

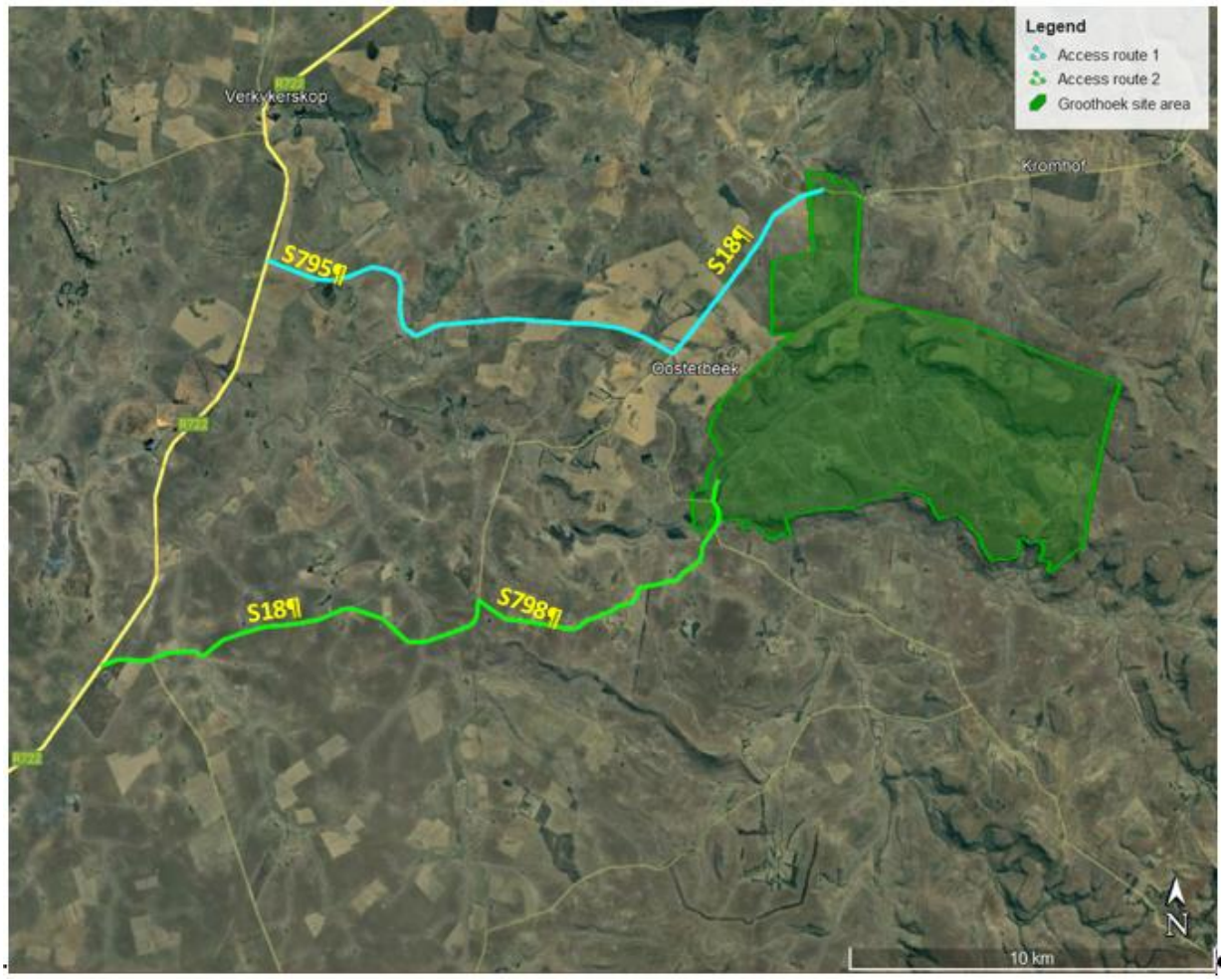

Figure 6-34 - Aerial View of recommended Access routes to Groothoek WEF site

Figure 6-35 - View of S795 from R722

Figure 6-36 - View of S18 from R722

In accordance with Figure 2.5.5(a) of the TRH17 Guidelines for the Geometric Design of Rural Roads (see **Figure 6-37**), the shoulder sight distance for a stop-controlled condition on a road with a speed limit of 100 km/h, needs to be a minimum of 420m for the largest vehicle (5m set back from the intersecting road).

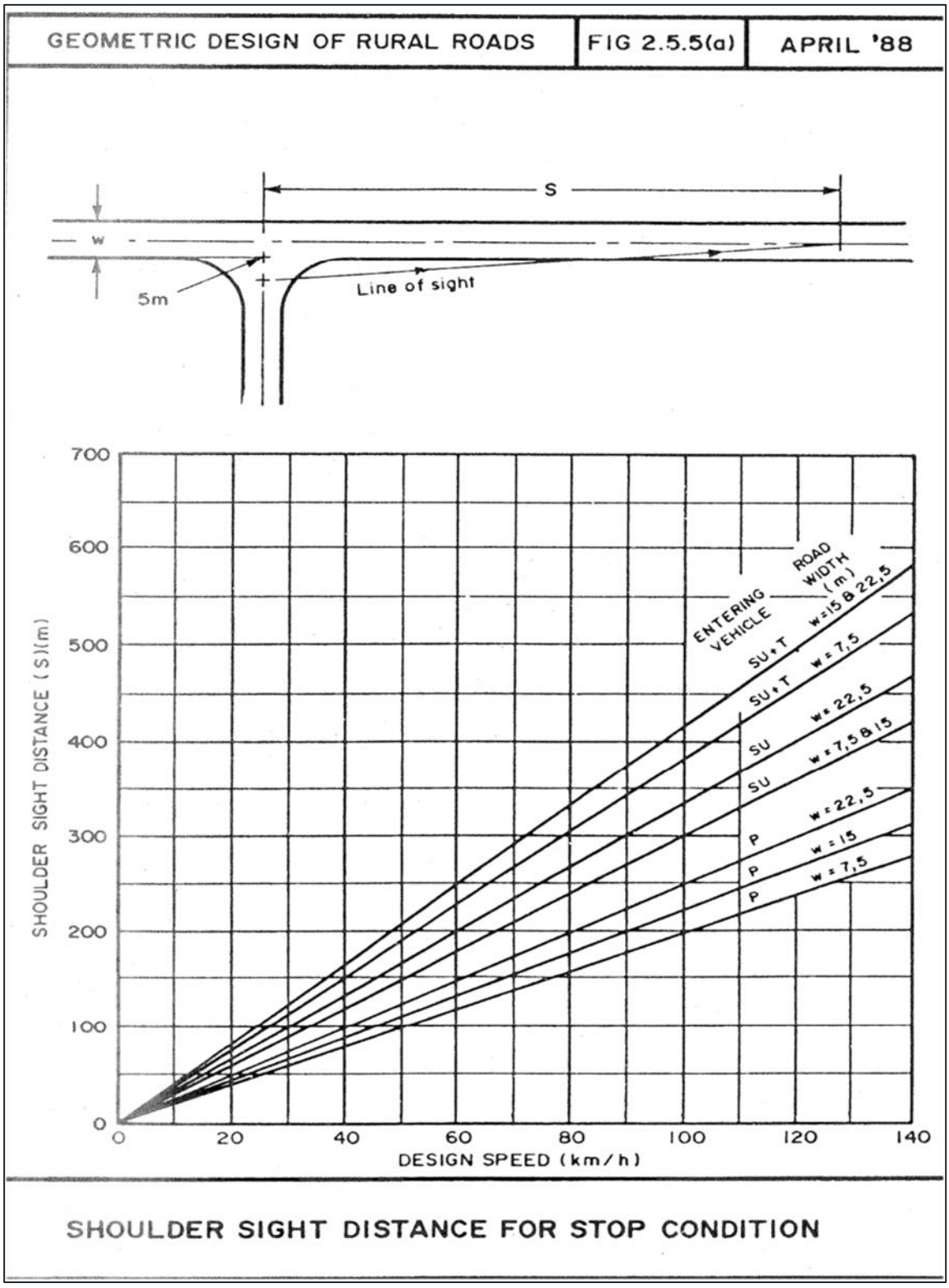

Figure 6-37 - Shoulder sight distance (TRH17)

The required minimum shoulder sight distances are met in both directions accessing the R722 from the S795 and S18, respectively (see **Figure 6-38** and **Figure 6-39**).

Figure 6-38 - Required Sight distances from S795 onto R722

Figure 6-39 - Required Sight distances from S18 onto S722

6.3.2.8 General

The geometric design and layout for the access roads need to be established at detailed design stage. Existing structures and services, such as drainage structures, signage, street lighting and pipelines will need to be evaluated if impacting on the roads. It needs to be ensured that gravel sections remain in good condition and will need to be maintained during the additional loading of the construction phase and then reinstated after construction is completed.

The geometric design constraints encountered due to the terrain should be taken into consideration by the geometric designer. Preferably, the internal roads need to be designed with smooth, relatively flat gradients (recommended to be no more than 8%) to allow a larger transport load vehicle to ascend to the respective laydown areas.

The access points to the site will need to be able to cater for construction and abnormal load vehicles. A minimum road width of 8 m is recommended for the access points and the internal roads can have a minimum width of 6 m. The radius at the access point needs to be large enough to allow for all construction vehicles to turn safely (i.e., bellmouths of min. 15m). Sight lines at the intersections of the R722 with the S18 and S795, respectively, need to be kept clear of any trees and shrubbery.

It is recommended that the direct site accesses are security controlled during the construction phase.

All temporary road markings and signage need to be in accordance with the South African Road Traffic Signs Manual (SARTSM). It is advised to provide temporary road signage along the R722 passing the turn offs onto the S18 and S795 to alert drivers of large haulage vehicles entering and exiting the roads.

Transportation of Materials, Plant and People to the proposed site

It is assumed that the materials, plant, and workers will be sourced from the surrounding towns as far as possible, as for example from Harrismith.

Public Transport and Non-Motorised Transport

In terms of the National Land Transport Act (NLTA) (Act No.5 of 2009), the assessment of available public transport services is included in this report. The following comments are relevant in respect to the public transport availability for the proposed development.

Non-motorised transportation (NMT) is a dominant mode of transportation, with private cars and minibus/taxis being the second-most used mode of transport, followed by buses. Currently, there are no known future planned public transport facilities in the vicinity of the site, but it is assumed that minibus taxis travel at irregular intervals along the R722. However, generally the appointed contractor of a large-scale project, such as many renewable energy projects, will provide shuttle buses or similar for workers during the construction phase.

6.3.3 VISUAL

The following is extracted from the Visual Impact Assessment Scoping Report compiled by WSP and is included as Appendix G.2.

The study area visual baseline is further described in the following subsections and illustrated by various maps and photos.

6.3.3.1 Topography

The natural topography of much of the vicinity is characterised by expansive rolling plateaus, contrasted by distinct escarpments and low cliff faces and ridges, various wide and narrower valleys that have been carved by a comprehensive network of watercourses, and several isolated and more prominent outcrops form distinct visual landmarks.

The topography of the Groothoek Project site is dominated by a broad valley that is larger and wider than those found in the other Verkykerskop Cluster project areas (**Figure 6-40**), which are generally located on higher-lying areas than Groothoek. As such, parts of the other project areas are also characterised by more pronounced topography, especially further to the east.

The higher parts of the Groothoek site are found along the northern, eastern and southern site boundaries, formed by plateaus that are in some instances marked by low, near-vertical rocky cliffs. Additionally, two of the highest and most prominent koppies in the region mark the eastern and northern corners of the site (bordering the western edge of the Markgraaff site). However, much of the overall Verkykerskop WEF study area forms a visual continuum from any given vantage point, and differentiating individual project boundaries from this a visual assessment perspective becomes somewhat arbitrary (**Figure 6-41**).

Figure 6-40 – The site topography consists of expansive rolling plateaus, contrasted by distinct escarpments, low cliff faces and ridges, and a broad lower-lying valley area

Figure 6-41 – More prominent outcrops form distinct landmarks, and the combined Verkykerskop WEF Cluster effectively forms a continuous visual study area

6.3.3.2 Hydrology (Drainage Features)

The Groothoek WEF is located within the Upper Wilge River Catchment Area, with the regional topography having been sculpted by a complex network of watercourses, and generally draining towards the west and north.

The Groothoek Project site is bisected by one of the upper tributaries of the Wilge River, and is characterised by a narrow, somewhat incised channel that meanders and curls through a much broader valley area. The main watercourse is also fed by several smaller tributaries from the north and south, creating a northeast-to-southwest orientated herringbone structure through almost the entire site.

However, from a visual perspective these watercourses are not particularly prominent, especially when viewed from some distance away, as they tend to easily be obscured by small rises in elevation and the surrounding vegetation and are also identified by the often-eroded channel sides than visible or standing water. However, several earth-embankment dams of varying sizes have been constructed in most of the north and south-orientated secondary tributaries feeding the main watercourse, and a much larger dam is located in the main watercourse, in the most downstream western end of the project site. These bodies of standing water form more prominent features in the landscape (**Figure 6-42**), especially in short- and medium-range views and tend to attract waterfowl and other bird species.

Figure 6-42 – The many small dams of different sizes form the most prominent hydrological aspect of the site, as the narrow watercourses are not distinct over greater distances

6.3.3.3 Vegetation Characteristics

Large parts of the greater region and Groothoek Project site itself are still characterised by original primary grassland vegetation communities, which is visually punctuated by clusters of shrubland along the steeper slopes and rocky areas (**Figure 6-43**), as well as bordering sections of the main drainage channel. Isolated clumps of indigenous willow (*Salix mucronata*) and exotic willow (*Salix babylonica*) also form local focal points and add interest in short-range views. Markedly, there are almost no areas of typical alien tree species invasion (i.e. eucalyptus, wattle, or poplar), and the only such trees occurring within the project site is a single small clump of eucalyptus that has been planted in the main farmstead area in the western half of the site.

The limited areas of cropped farmland are mainly isolated to the higher-lying plateaus along the northern and southern site boundaries, as well as gently sloping sections of the river valley. From a

distance these areas become less distinct and the landscape blends into a mosaic patchwork of textures and different greens, browns, tans, and reds (**Figure 6-44**). The vegetation cover is also characterised by a marked change in appearance from summer to winter, as grasses change from green to brown and crop areas are planted and subsequently harvested.

Figure 6-43 – Most of the site is characterised by original primary grassland vegetation communities, which is visually punctuated by shrubland along the steeper slopes and rocky areas

Figure 6-44 – The areas of cropland and natural vegetation blends into a mosaic patchwork of textures and different colours

6.3.3.4 Land Cover and Land Uses

The visual context of the project site is distinctly rural and is primarily untransformed and natural in character, and areas of development and active human use are limited. Importantly, none of the few manmade structures protrude above the very characteristic horizon and are therefore not visually dominant and blend into the surrounding landscape (**Figure 6-45**).

Figure 6-45 – The limited areas of human land use are not visually prominent and blend into the surrounding landscape

6.3.3.5 Seasonal and Atmospheric Conditions

A further aspect of the visual baseline that needs to be considered is that of weather-related/atmospheric conditions and seasonal variations. Prevailing atmospheric conditions can greatly influence how a landscape is perceived by viewers, as well as the range over which views are possible.

The study area is located in a summer rainfall region, while winters are cold and mostly dry. Mist is common particularly during winter, greatly reducing visibility when it is present. Airborne pollution in the region is limited, but high humidity or smoke from fires often result in hazy atmospheric conditions. Fires can also significantly impact visual conditions, causing vast and highly visible smoke columns which greatly reduce visibility in short-range views.

In addition, seasonal changes greatly change the appearance of most landscapes, with the region typically alternating from vast expanses of various hues of green during the rainy season, to more subdued browns and tans during the winter (**Figure 6-46**). Croplands also change in appearance, from bare earth at the start of the spring planting season to visually uniform fields of corn during summer, which gradually brown and yellow during autumn before harvesting, following which the fields are again characterised by exposed earth and bare stalks.

Figure 6-46 – The predominant vegetation cover is characterised by a marked change in appearance from summer to winter, as grasses change from greens to browns and tans (source: Google Earth, photo credit Sandra and Hennie Cronje)

6.3.4 SOCIAL

The following is extracted from the Social Impact Scoping Report compiled by WSP and is included as Appendix G.11.

6.3.4.1 REGIONAL CONTEXT

The proposed project is in the Free State Province, located in the eastern part of the province at the boundary of Kwa-Zulu Natal Province. The whole project area (i.e. the farm portions assessed) covers an area of 23 814km².

The province is divided into five district municipalities: Fezile Dabi, Mangaung, Xhariep, Lejweleputswa, and Thabo Mofuntsanyane, where the proposed project is located. These five districts are further subdivided into 19 Local Municipalities. The proposed project is situated in the Phumelela Local Municipality (PLM).

6.3.4.2 DISTRICT CONTEXT

Thabo Mofutsanyane District Municipality is a Category C municipality located in the eastern part of the Free State Province. It is bordered by the Dannhauser local municipality in KwaZulu-Natal Province.

The district comprises six local municipalities: Dihlabeng, Mantsopa, Nketoana, Phumelela, Setsotso, and Maluti-A-Phofung (Coorperative Governance Traditional Affairs, 2022).

6.3.4.3 LOCAL CONTEXT

Phumelela Local Municipality covers an area of 8197 km². It is one of the six local Municipalities within the Thabo Mofutsanyane District Municipality. It has a population of 52,224 people (Statistics South Africa, 2022). PLM is the least populated municipality of the six local municipalities in Thabo Mofutsanyane District Municipality.

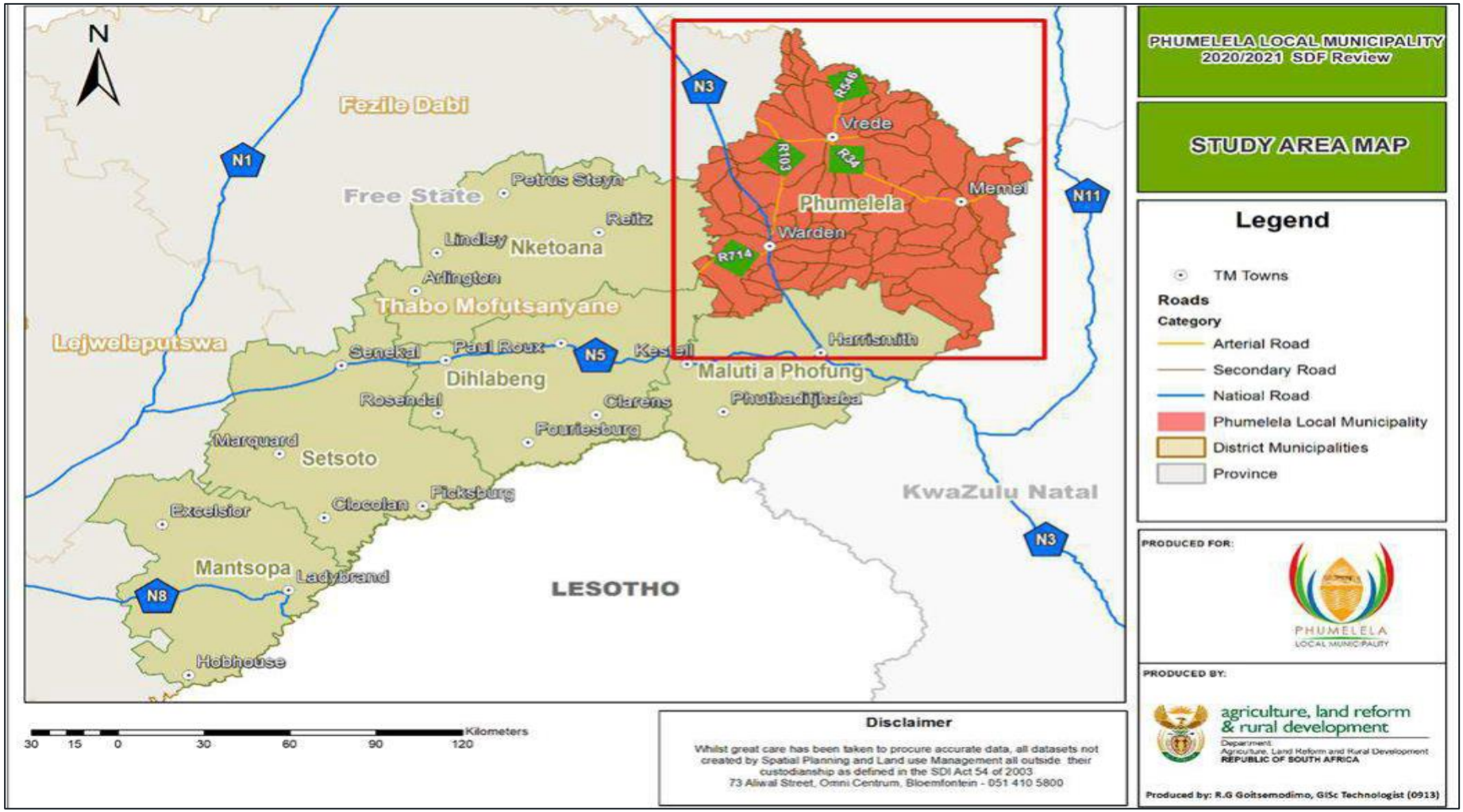

Figure 6-47 - Local Context

Source: (Agriculture ,Land Reform and Rural Development, 2021)

Phumelela Local Municipality is accessible through two National Roads and four Provincial main roads, which are R34, R714, R103, R722, N11, and N3. Figure 6-47 (Agriculture ,Land Reform and Rural Development, 2021)below depicts the local context. It comprises three towns, namely Vrede, warden and Memel, which is 5 km North of the Project area (Coorperative Governance Traditional Affairs, 2022) .

6.3.4.4 DEMOGRAPHIC OVERVIEW

Trends in demography are fundamental driving forces for any development of an area in terms of housing, retail, engineering services, community and government services, safety, and security. The demographic profile influences the type of goods and services, their level of demand and the pressure on local services, infrastructure, and public transport. The demography informs the project of potential social context that may influence the project either negatively or positively. When the project is aware of the local social contexts, better informed decision making is enhanced. This will create a healthy social license to operate and create a conducive environment for both the local community and the project to co-exist.

POPULATION

According to the 2016 Community Survey by Statistics South Africa, the municipality had a population of 50054. However, according to the recent statistics released in 2022, the population has increased to 52,224. (Statistics South Africa, 2022). This indicates that the population is growing and may mean a higher energy demand in the area. Therefore, a WEF can be considered a viable solution to meet the energy demand.

GENDER AND AGE PROFILE

The population pyramid below is a graphic representation of the population categorised by gender and age for PLM. The horizontal axis depicts the share of people, with the male population charted on the right-hand side and the female population on the left-hand side of the vertical axis. The vertical axis is divided into 5-year age categories. The figures below show Phumelela's population pyramid/structure based on the Census Community Survey 2016. See **Figure 6-48** for the population pyramid.

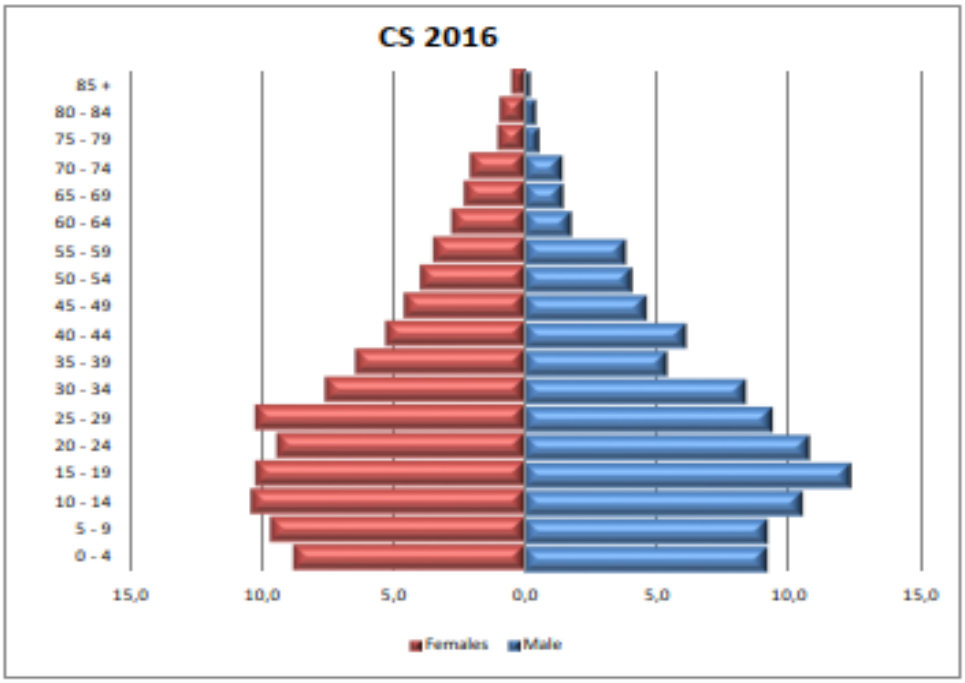

Figure 6-48 - Population Pyramid, 2016

The figure above shows that, in 2016, PLM males had the highest proportions for the age group 15-19 than females. As age increases, the population decreases. Female numbers started to decrease from age 30-34, whereas males decreased from age 20-24. In 2016, the municipality had the lowest population in the age group (0-4) for both males and females compared to the Census 2011, which had the highest population proportion for the age group 0-4 years. In 2016, the pyramid showed that fertility rates decreased as the 0-4 age group decreased, and more male children were born than female children. (Phumelela Local Municipality, 2022-2027, p. 57).

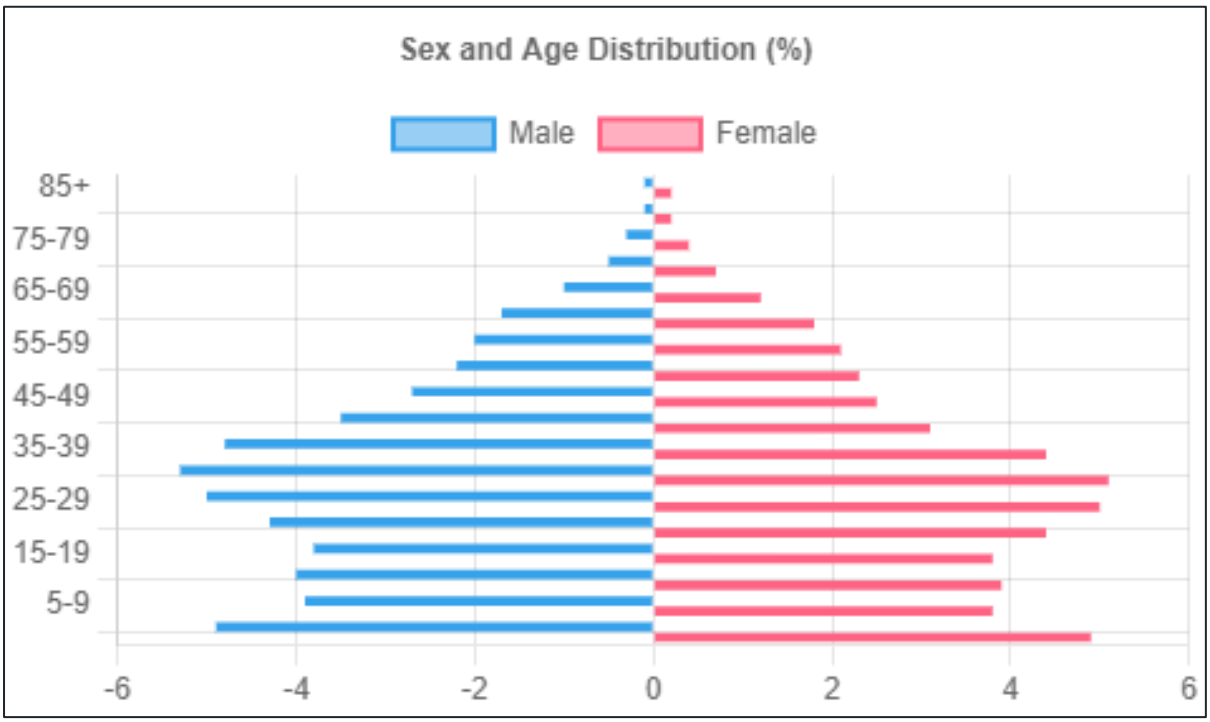

Figure 6-49 - Sex and Age Distribution, 2022

Source: (Statistics South Africa, 2022)

In 2022, the total male population was 47.8 % and females at 52.1 %. The working age (15-64) increased by approximately 4 % from 2011 to 2022. These figures may impact the project positively as the pyramid indicates available human resources that the project can employ. See Figure 6-49 above.

HOUSEHOLD LIVING CONDITIONS

The project is situated on a farmland. According to (Statistics South Africa, 2022) 60% of the population within the municipality uses electricity from the main grid as an energy source (see **Figure 6-50** below).

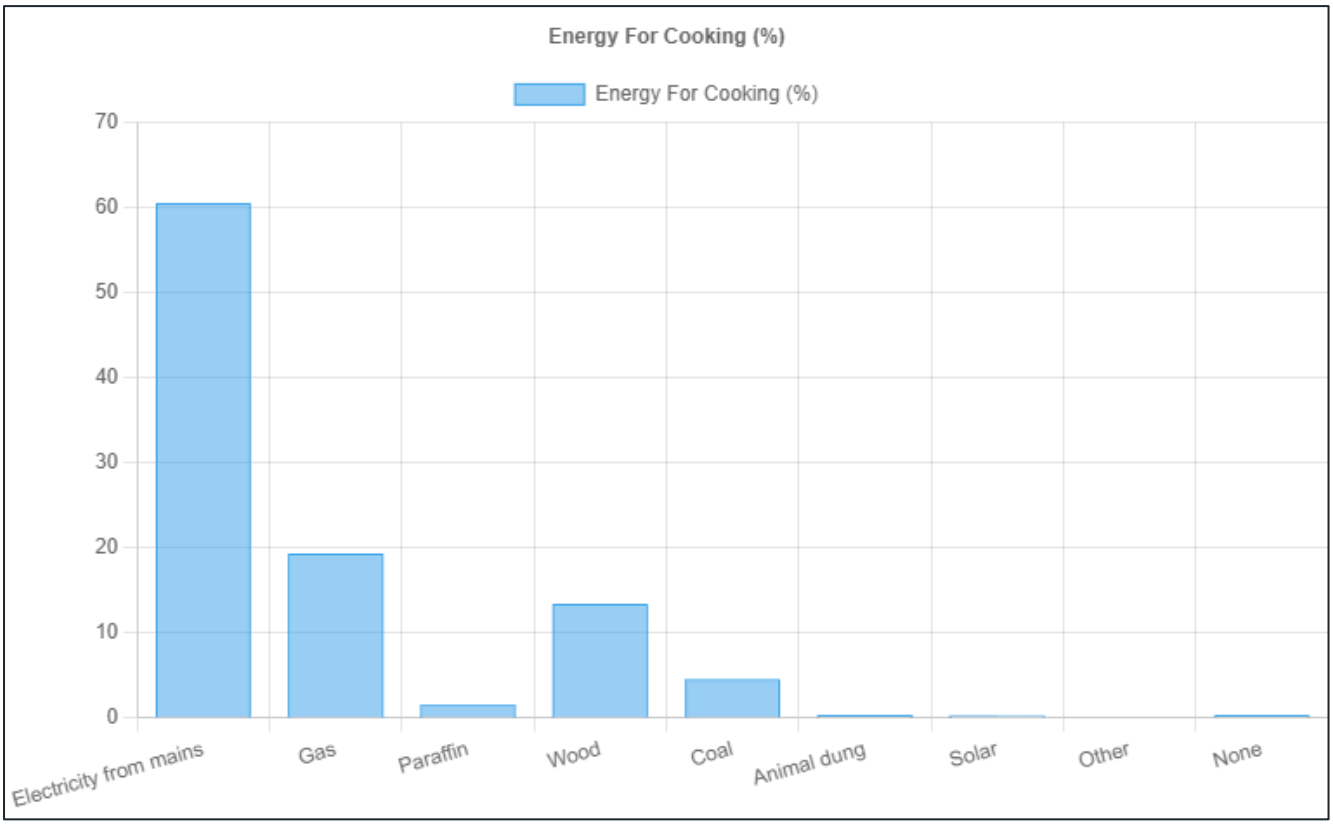

Figure 6-50 - Energy for Cooking

Source: (Statistics South Africa, 2022)

The graph above shows that out of the population, 20% rely on gas for cooking, 12% rely on wood, and less than 1% use renewable energy. By implementing the project, the pressure on non-renewable energy use will decrease, and the usage of green energy will be promoted. This is necessary as the graph indicates that there is more reliance on the grid for energy. The grid will be powered by wind renewable energy.

EDUCATIONAL PROFILE

Education is important to a country's economic growth and its industries' development, providing a trained workforce and skilled professionals. The education measure represents an individual's highest level of education, using those aged five years and older. See **Figure 6-51**

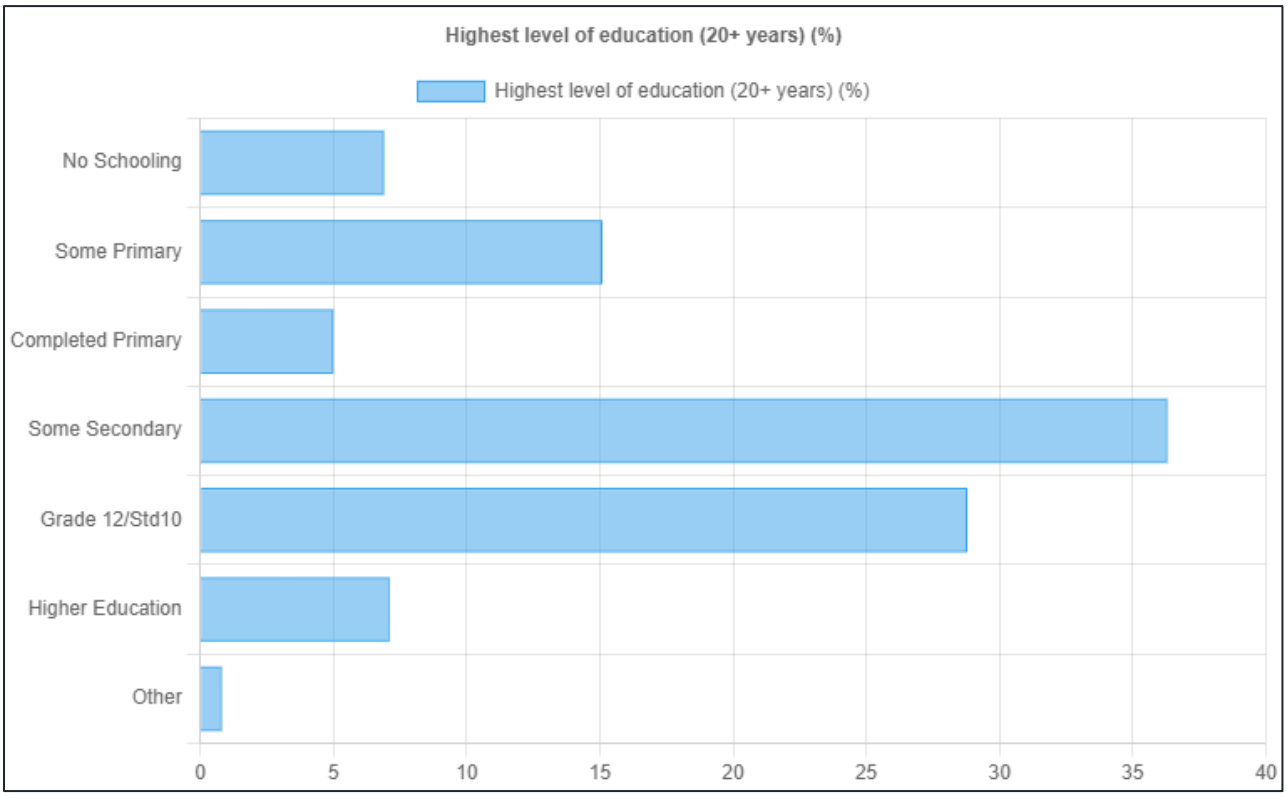

Figure 6-51 - Highest Level of Education (20 + years) (%)

Source: (Statistics South Africa, 2022)

According to (Statistics South Africa, 2022) 74.1 % of people aged 5 to 24 have attended educational institutions. Of these, only 7.1 % have obtained higher education beyond matric. This may indicate a shortage of skilled labourers for the project and a potential surplus of low- to semi-skilled labourers.

LABOUR PROFILE

A country's labour force consists of all working-age individuals who are either seeking employment or are employed. See **Figure 6-52** below.

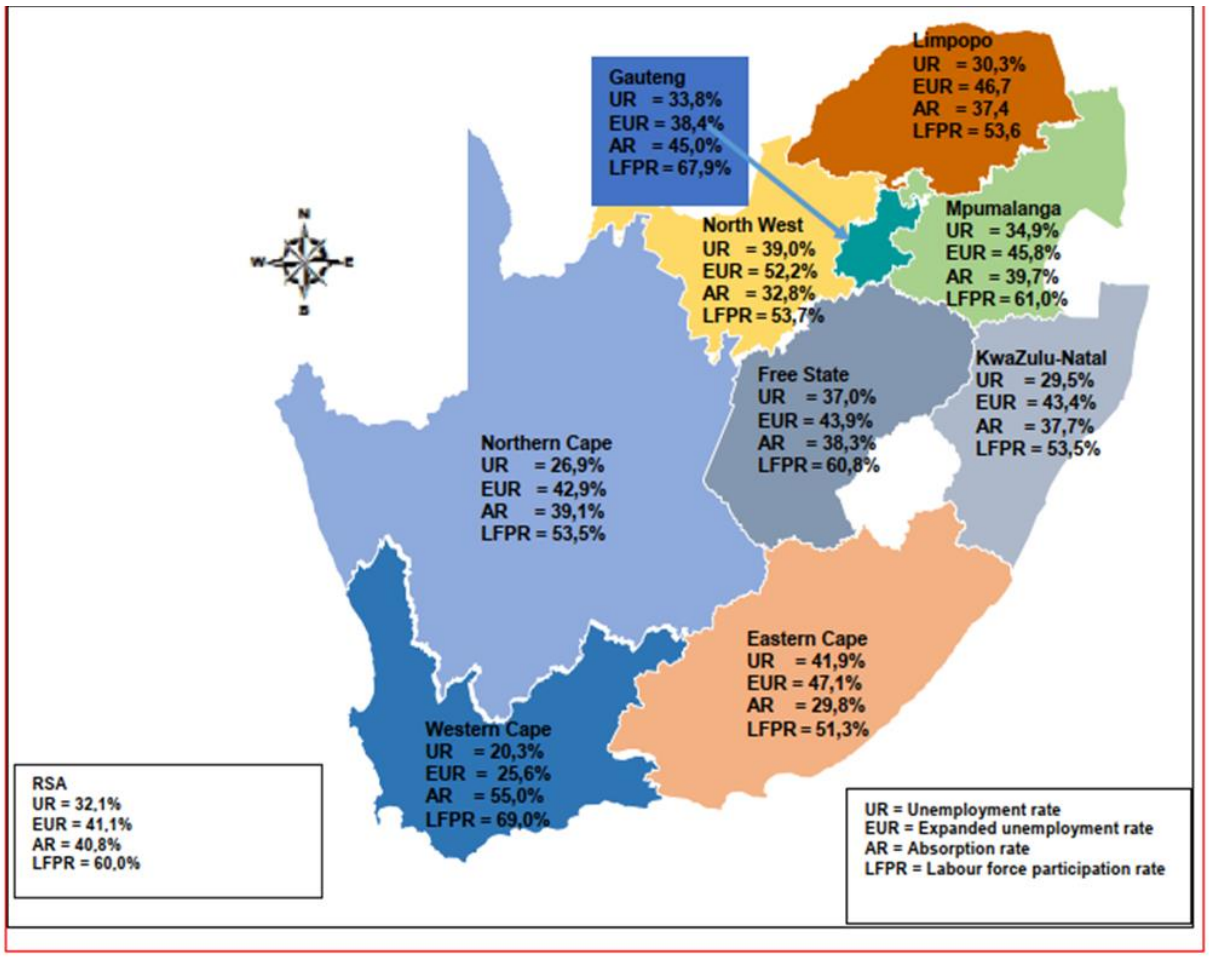

Figure 6-52 - Summary of the Labour Market Measures at a Glance, Q4:2023

Source: (Statistics South Africa, 2023)

According to (Statistics South Africa, 2011), the unemployment rate for Free State Province is 25.3 % lower than the country's overall 32.1 % unemployment rate and 37.0 % unemployment rate of the Free State Province. (Stats SA, 2023).

COMMUNITY HEALTH

According to the Phumelela municipality, IDP indicates a shortage of health facilities, with one hospital located at Vrede. Four clinics, three mobile clinics, and two community care centres (Phumelela Local Municipality, 2022-2027). (See **Table 6-6**)

Table 6-6 – Health Facilities

Area	Hospital	Clinic	Mobile Clinic	Community Care Centre
Vrede	1	1	0	0
Thembalihle	0	1	1	1 (Disability Centre)
Warden	0	1	1	1 (Soup Kitchen)

Area	Hospital	Clinic	Mobile Clinic	Community Care Centre
Ezenzeleni	0	0	0	0
Memel	0	1	1	0
Zamani	0	0	0	0

(Phumelela Local Municipality, 2022-2027)

6.3.5 ACOUSTIC

The following is extracted from the Acoustic Scoping Input Report compiled by WSP and is included as Appendix G.3.

6.3.5.1 Sensitive Receptors

Sensitive receptors are identified as areas that may be impacted negatively due to noise associated with the proposed WEF. Examples of receptors include, but are not limited to, schools, shopping centres, hospitals, office blocks and residential areas. Being such a remotely located site, dominant receptors in the area surrounding the site include small farmsteads and farmhouses. From a desktop assessment of the site using Google Earth™ imagery (and input from the Client), seven farmhouse receptors have been identified within the site boundary (**Figure 6-53**), which will all be considered in this study. As per the IFC EHS guidance for Wind Energy, receptors within 2 km of the proposed site are considered.

6.3.5.2 Existing Noise Climate

The existing noise climate surrounding the Groothoek WEF is predominantly rural with very low baseline noise levels anticipated. Noise sources include birds, insects, livestock and the activities of resident farmers. Vehicular influences may include traffic on local roads.

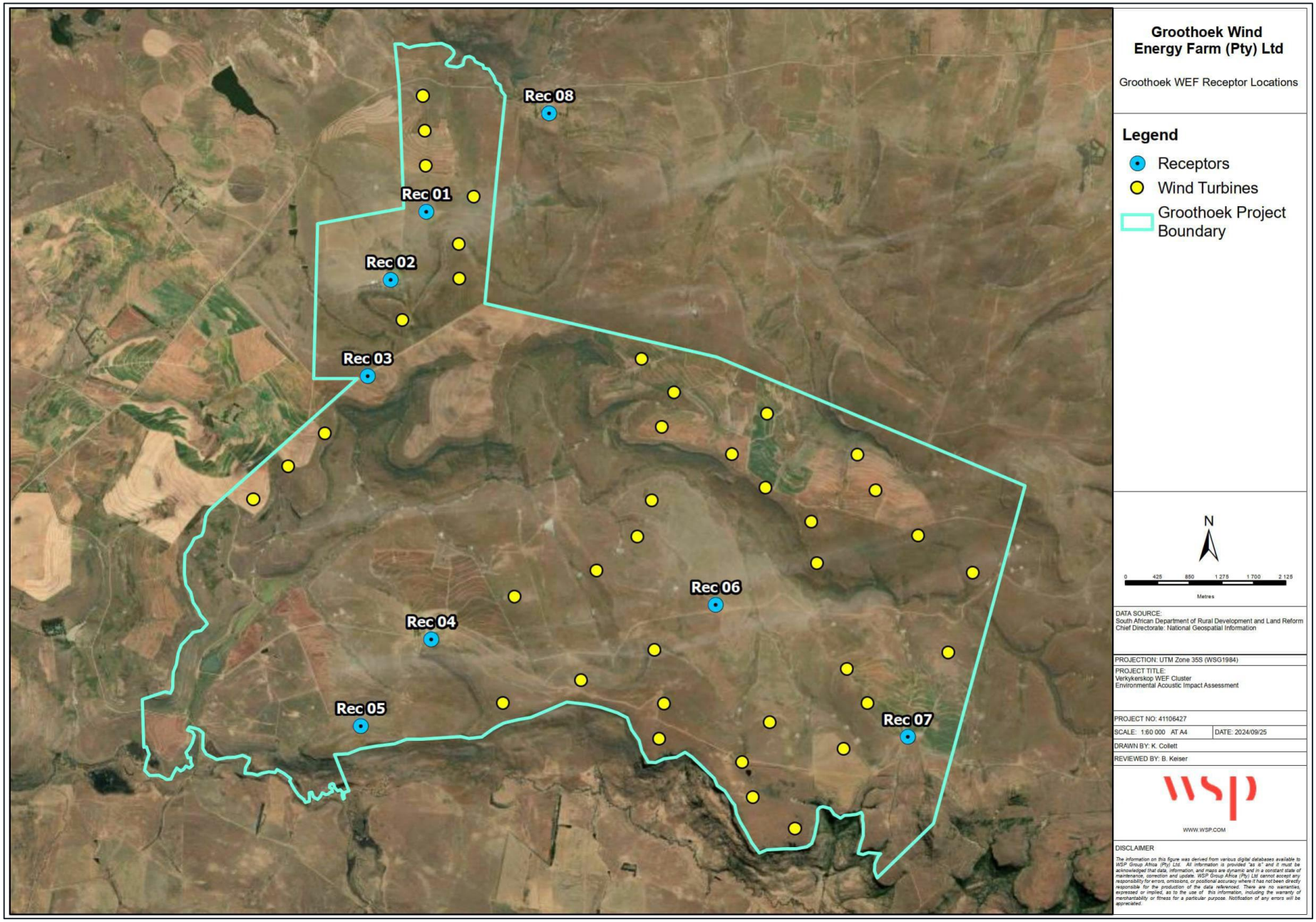

Figure 6-53 - Sensitive receptors surrounding the Groothoek WEF

Noise from wind turbines can be classified into two categories, namely mechanical noise generated from the turbine's mechanical components and aerodynamic noise, produced by the flow of air over the turbine blades.

6.3.5.3 Sensitive receptors

Sensitive receptors are identified as areas that may be impacted negatively due to noise associated with the proposed WEF. Examples of receptors include, but are not limited to, schools, shopping centres, hospitals, office blocks and residential areas. Being such a remotely located site, dominant receptors in the area surrounding the site include small farmsteads and farmhouses. From a desktop assessment of the site using Google EarthTM imagery (and input from the Client), twenty farmhouse receptors have been identified within and adjacent to the site boundary (Figure 6-46), which will all be considered in this study. As per the IFC EHS guidance for Wind Energy, receptors within 2 km of the proposed site are considered.

6.3.5.4 Existing Noise Climate

The existing noise climate surrounding the Groothoek WEF is predominantly rural with very low baseline noise levels anticipated. Noise sources include birds, insects, livestock and the activities of resident farmers. Vehicular influences may include traffic on local roads

6.3.5.5 Mechanical Noise

The mechanical noise generated by a wind turbine is predominantly tonal (dominated by a narrow range of frequencies), but may also be broadband in character, displaying a wide range of frequencies (Council of Canadian Academics, 2015). Such noise is produced by the physical movement of the following components:

- Gearbox
- Generator
- Yaw drives
- Cooling fans
- Auxiliary equipment

Over time, appropriate design and manufacturing have reduced the mechanical noise produced by wind turbines. As such, the aerodynamic noise from the blades has become the dominant source of noise for modern turbines, however, low-frequency tones associated with mechanical sources are audible for some turbines (Hau, 2006; Manwell et al., 2009; Oerlemans, 2011).

6.3.5.6 Aerodynamic Noise

Aerodynamic noise is typically broadband in nature and is generated by the interaction between airflow and different parts of the turbine blades. These interactions depend on the speed and turbulence of the wind; the shape of the blade; the angle between the blade and relative wind velocity flowing over the blade; and the distance from the hub. The noise levels produced are relative to the velocity of the airflow, with higher rotor speeds resulting in higher noise levels. Specifically, parts of the blade closer to the tips move faster than those closer to the hub, resulting in faster relative air velocities and creating higher aerodynamic noise levels. As such, most of the aerodynamic noise is produced near (but not at) the blade tips. This is partly why turbines with longer blades have a higher sound power level (Oerlemans, 2011).

Aerodynamic noise from wind turbines also has a strong directional component, projecting primarily downward, upward, or even perpendicular depending on the dominant mechanism (Oerlemans, 2011). As such, noise levels measured at a particular location can vary depending on the direction, speed and turbulence of the prevailing wind. Furthermore, as the rotor turns, the orientation of each blade changes in relation to a stationary receiver. As such, the noise levels at the receiver will vary as the blades rotate, resulting in periodic regular changes in noise levels over time (Renewable UK, 2013).

As wind speed increases, the aerodynamic noise of the turbines also increases. At low speeds, the noise created is generally low and increases to a maximum at a certain speed (around 10 m/s) where it either remains constant or can even slightly decrease.

6.3.5.7 Low Frequency Noise and Infrasound

Wind turbines also produce some steady, deep, low-frequency sounds (between 1 – 100 Hz), particularly under turbulent wind conditions. Sound waves below 20 Hz are called infrasound. These infrasound levels are only audible at very high sound pressure levels. Older wind turbines that had downwind rotors created noticeable amounts of infrasound. Levels produced by modern-day, up-wind style turbines are below the hearing threshold for most people (Jakobsen, 2005).

The human ear is substantially less sensitive to sound at very low or very high frequencies. For most people, a very low-pitch sound (20 Hz) must have a sound pressure level of 70 dB to be audible. Levels of infrasound near modern commercial wind turbines are far below this level and are generally not perceptible to people (Leventhall, 2006).

Low-frequency sound, like all other sound, decreases as it travels away from the source. Siting wind turbines further away from sensitive receptors will therefore decrease the risk of infrasound. It is, however, important to note that in flat terrain, low-frequency sound can travel more effectively than high-frequency sound. Most environmental sound measurements and noise regulations are based on the A-weighed decibel scale (dB(A)), which under-weights low frequency sounds in order to mimic the human ear. Thus, noise limits based on the dB(A) levels do not fully regulate infrasound. The dB(C) scale offers an alternative to measuring sound that provides more weight to lower frequencies (Jakobsen, 2005; Bolin *et al*., 2011).

SANS 10103 proposes a methodology to identify whether low-frequency noise could be an issue. The method suggests that if the difference between LAeq and LCeq is greater than 10 dB, then a predominantly low-frequency component may be present. However, in all cases, the existing acoustic energy in low frequencies associated with wind must be considered.

6.3.5.1 Substation and Transformer Noise

In addition to the noise from wind turbines, wind farms require a substation and transformers, which produce a characteristic “hum” or “crackle” noise. Utility companies have experience with building and siting such sources to minimise their impact. Substation-related noise is relatively easy to mitigate should this be required, based on the use of acoustic shielding and careful planning regarding placement away from sensitive receptors. As such, noise associated with this source is not considered in this assessment.

6.3.5.2 Noise impact on Animals

It can be noted that there are a limited number of studies that investigated the impact of noise on animals (both domestic and wild), and no studies that investigate animal reactions to wind turbine

noise specifically. The only animal that is being studies in detail are human beings and many of these studies are still ongoing.

Excluding loud impulsive noises, it has been observed that most domestic animals are generally not affected by noise and typically acclimatise quickly to loud noises. Considering the expected wind turbine noise levels, it is not expected to impact on domestic animals. The same can be said for wild animals, where sensitive animals are likely to relocate to quieter areas.

To date there are no guidelines or sound limits with regards to o noise levels that can be used to estimate the potential significance of noises on animals (Blickley et al., 2010).

7 SITE SENSITIVITY AND VERIFICATION

Specialist assessments were conducted in accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes, which were promulgated in Government Notice No. 320 of 20 March 2020 and in Government Notice No. 1150 of 30 October 2020 (i.e. “the Protocols”), or Appendix 6 of the EIA Regulations, depending on which legislation apply to the assessment under consideration. A summary of the DFFE screening tool, the applicable legislation as well as the specialist sensitivity verification are detailed in **Table 7-1** below.

The complete Site Sensitivity Verification Report is included in **Appendix F**.

Table 7-1 - Assessment Protocols and Site Sensitivity Verifications

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
Agricultural Impact Assessment	Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) of 4 NEMA, 1998).	High Sensitivity	An Agricultural Agro-Ecosystem Specialist Assessment must be undertaken as the proposed activity is identified as high sensitivity for agricultural resources. The outcome of the site sensitivity verification can be found in Section 7 of the Agricultural Impact Assessment (**Appendix G.4**). The results of the DFFE Screening Tool indicated that the Agricultural theme has a High Sensitivity, and the specialist confirmed that those parts of the site, on which there are currently viable croplands, as being of High agricultural sensitivity and the rest of the site as being of medium agricultural sensitivity.
Landscape/Visual Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	Very High Sensitivity	The outcome of the sensitivity verification can be found in Section 5 of the Visual Impact Assessment and Sensitivity Receptors are found in Section 7. The results DFFE Screening Tool indicates that large parts of the study area are of very high or high visual resource value, and that the areas of least concern are located along the lower-lying valley which was confirmed by specialist results that indicated

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
			that potential visual receptor base to the proposed development is somewhat limited but diverse. Furthermore, the visual resource value of the site within the context of the surrounding study area is very high, owing mainly to the low prevailing levels of development, highly characteristic topography, and largely intact Highveld grassland cover, and furthermore also has a low ability to absorb visual change.
Archaeological and Cultural Heritage Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	Low Sensitivity	The outcome of the sensitivity verification can be found in Appendix A of the Heritage Scoping Assessment (**Appendix G.10**). The results of the DFFE Screening Tool indicated that the Heritage theme has a Low Sensitivity, and the results of the specialist's desktop study indicated that the proposed site has a Medium Sensitivity.
Palaeontology Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	Very High Sensitivity	The outcome of the sensitivity verification for the palaeontological sensitivity can be found in Appendix A of the Heritage Scoping Assessment (**Appendix G.10**). The results of the DFFE Screening Tool indicated that the Palaeontological theme has a Very High Sensitivity, and the results of the specialist's desktop study indicated that the proposed site has Insignificant, Moderate to Very High Sensitivity, and further studies will be required in the EIA phase.
Terrestrial Biodiversity Impact Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity where the site of the proposed activity is identified as very high sensitivity	Very High Sensitivity	The site sensitivity verification can be found in Section 3, 4 and 7 of the Terrestrial and Aquatic Biodiversity Assessment (**Appendix G.6**).

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
	for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment. gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) of 4 NEMA, 1998).		The results DFFE Screening Tool indicated that the Terrestrial Biodiversity theme has a Very High Sensitivity due to its overlap with Critical Biodiversity Areas (CBA) 1 and 2, Ecological support Areas (ESA) 1 and 2, FEPA sub catchments and National Protected Areas Expansion Strategy (NPAES). However, this result was disputed by the results of the biodiversity study indicated that the terrestrial biodiversity would have a Medium Sensitivity in terms of ESA and High Sensitivity in terms of CBA. Although much of the Project area may be occupied by cultivated/secondary grasslands, areas that coincide with provincial conservation targets require special consideration in design phase to minimise impacts and possible offset requirements
Aquatic Biodiversity Impact Assessment	Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation (GN 320, 20 March 2020)) provides the criteria for the assessment and reporting of impacts on aquatic biodiversity for activities requiring environmental authorisation.	Very High Sensitivity	The site sensitivity verification can be found in Section 5, 6 and 7 of the Freshwater Ecological (Aquatic Biodiversity) Assessment (**Appendix G.5**). The results of the DFFE Screening Tool indicated that the Aquatic Biodiversity theme has a Very High Sensitivity due to the presence of FEPA sub-catchments, Rivers_AB, Wetlands_(Rivers) and Wetlands Mesic Highveld Grassland Bioregion: Depression; Floodplain and Valley Bottom. The specialist confirmed the overall sensitivity of the project area is considered to be High due to the presence of NFEPA wetland cluster, and rivers in good ecological condition within 500 m of Project area.
Avian Impact Assessment	Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms	Low Sensitivity	The site sensitivity verification can be found in Section 5, of the avifauna Impact Assessment (**Appendix G.7**).

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
	Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998)., when applying for environmental authorisation (GN 320, 20 March 2020)) provides the criteria for the assessment and reporting of impacts on avifaunal species associated with the development of onshore wind energy generation facilities, where the electricity output is 20 megawatts or more, which require environmental authorisation		The results DFFE Screening Tool indicated that the Avian theme has a Low Sensitivity. However, this result was disputed by the results of the Avifauna study which indicate that the Avian theme has a High Sensitivity best be described as supporting a moderate abundance of birds, of which a very high proportion are of conservation importance.
Vulture Species Theme	Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998)., when applying for environmental authorisation (GN 320, 20 March 2020)) provides the criteria for the assessment and reporting of impacts on avifaunal species associated with the development of onshore wind energy generation facilities, where the electricity output is 20 megawatts or more, which require environmental authorisation	High Sensitivity	The site sensitivity verification can be found in Section 5, of the avifauna Impact Assessment (**Appendix G.7**). The results DFFE Screening Tool indicated that the Vulture theme has a High Sensitivity, and this has been confirmed by the specialist results as a high number of priority species nests and roosts (including three Cape Vulture roosts), it is apparent that the project area is situated in an area of high avifaunal importance and sensitivity, particularly from a threatened vulture perspective.
Bat Impact Assessment	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Bats	High Sensitivity	The site sensitivity verification can be found in Section 6.2, of the Bat Impact Assessment (**Appendix G.8**). The results DFFE Screening Tool indicated that the Bat (Wind) theme has a High Sensitivity. This result was confirmed by the specialist.

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
Civil Aviation Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on civil aviation installations	Low Sensitivity	Low Sensitivity The relevant stakeholders i.e. CAA and ATNS have been included on the project database. However, no comment has been received to date.
Defence Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on civil aviation installations	Low Sensitivity	Low Sensitivity
RFI Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	Low Sensitivity	Low Sensitivity
Noise Impact Assessment	Protocol for specialist assessment and minimum report content requirements for noise impacts	Low Sensitivity	The results DFFE Screening Tool indicated that the noise theme has a Low Sensitivity. The specialist stated that the status of these receptors (inhabited or uninhabited) needs to be confirmed (ground-truthed) in the EIA phase in order to effectively quantify the noise impacts of the WEF. However, confirmed the overall impact of the project is considered to be Medium Sensitivity (**Appendix G.3)**
Flicker Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	Low Sensitivity	The specialist has confirmed a low sensitivity.
Traffic Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification	No sensitivity identified by the screening tool	

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
	and must comply with Appendix 6 of the EIA Regulations.		
Geotechnical Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool	
Socio Economic Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool	
Plant Species Assessment	Protocol (Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of sections 24(5)(a) and (h) and 44 of NEMA, gazetted on 30 October 2020), provides the criteria for the assessment and reporting of impacts on plant and animal species for activities requiring environmental authorisation.	Medium Sensitivity	The executive summary and Section 3 of the specialist report outlines the specific sections of the report which align with the terrestrial biodiversity protocol. The site sensitivity verification is discussed in Section 3.3 section of the Terrestrial and Aquatic Species Assessment (**Appendix G.6**) The results DFFE Screening Tool indicated that the Plant Species theme indicated Medium Sensitivity on account of the potential presence of at least 2 flora species of conservation concern, namely, sensitive species 1252 and 998, whose names have been withheld due to their vulnerability to illegal harvesting The specialist confirmed that the site has Medium Sensitivity since there is the presence of Primary and secondary grasslands could support plant Species of Conservation Concern (SCC).

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
Animal Species Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) of 4 NEMA, 1998), provides the criteria for the assessment and reporting of impacts on plant and animal species for activities requiring environmental authorisation.	High Sensitivity	The executive summary and Section 3 of the specialist report outlines the specific sections of the report which align with the terrestrial biodiversity protocol. The site sensitivity verification is discussed in Section 3.3 section of the Terrestrial and Aquatic Species Assessment (**Appendix G.6**) The results DFFE Screening Tool indicated that the Animal Species theme has a High Sensitivity due to the potential presence of due to the presence of 32 species (those identified in the screening report and the additional species identified from the literature review) that are likely to occur within the Project area. However, this result was disputed by the specialist who confirmed that the site has Medium Sensitivity due to the possible presence of protected species.

7.1 CONSOLIDATED SITE SENSITIVITY

The sensitivity input provided by specialists was utilised to compile the Consolidated Site Sensitivity Map (**Figure 7-1**). The map in **Figure 7-1** has been overlain by the preliminary project layout.

Based on the input received from the specialists during the Scoping Phase, the layout was then optimised. The consolidated sensitivity map is overlain by the optimised project layout in **Figure 7-2.** This “optimised” layout will be further assessed by the specialists during the EIA Phase and amended and further optimised as required.

Figure 7-3 illustrates both the preliminary and optimised layouts for comparison purposes.

Given the nature of the data provided by the avifauna specialist, separate avifauna sensitivity maps were created to properly illustrate all avifaunal sensitivities including their respective buffers. **Figure 7-4** depicts the avifaunal sensitivities overlain by the preliminary and optimised layouts for comparison. **Figure 7-5** depicts the avifaunal sensitivities overlain by the optimised layout for the project. The turbines within the ‘no-go zone’ areas (i.e. Avifauna Zone 1) have been acknowledged and are indicated in red (**Figure 7-4** and Figure 7-5). With regards to the Groothoek WEF, only two turbine locations will require relocation as a result of the avifauna sensitivities. The layout will be amended accordingly and provided to the specialist team for assessment in the EIA phase .

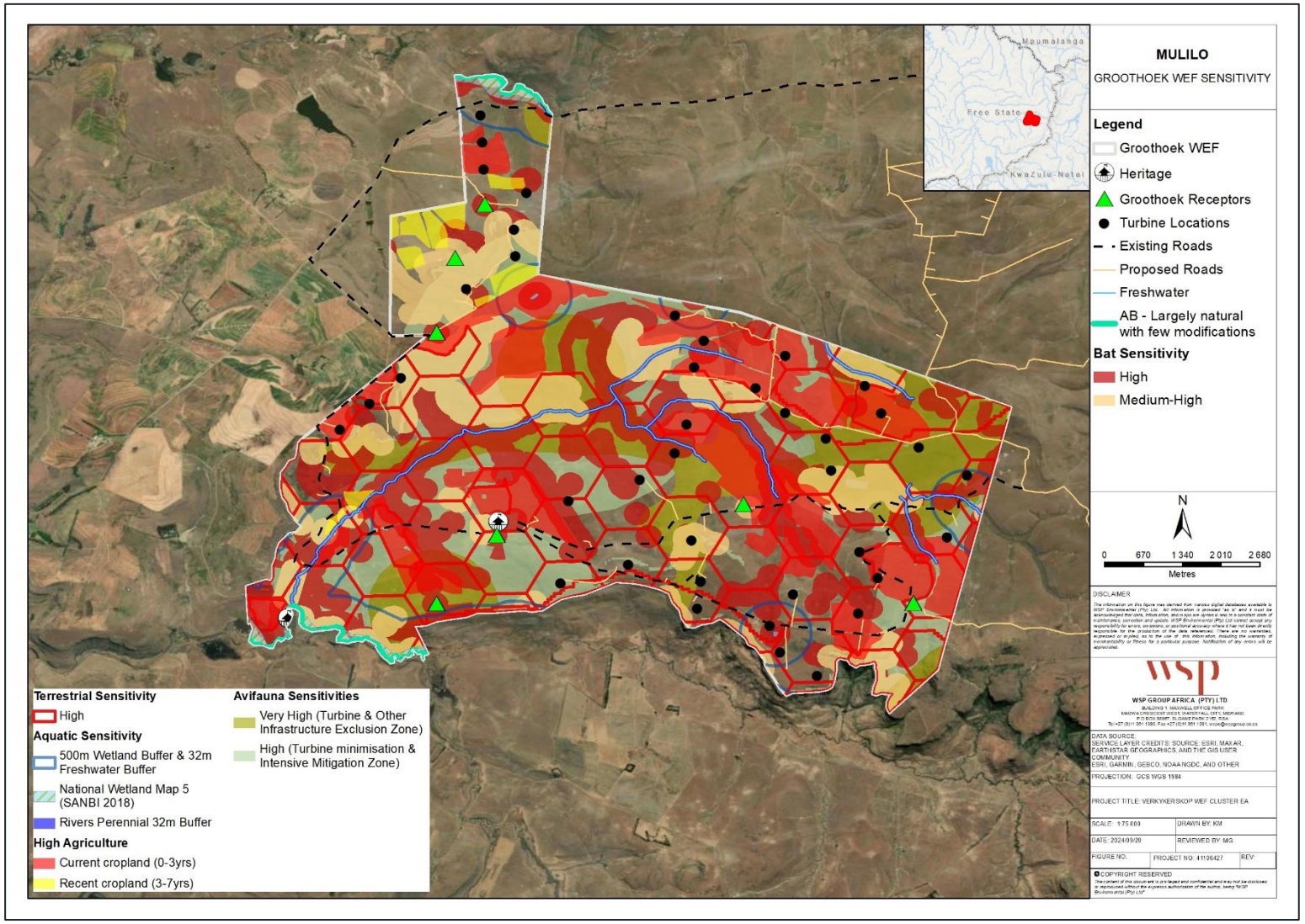

Figure 7-1 - Groothoek WEF – Consolidated Site Sensitivity Map overlain by Preliminary Project Layout

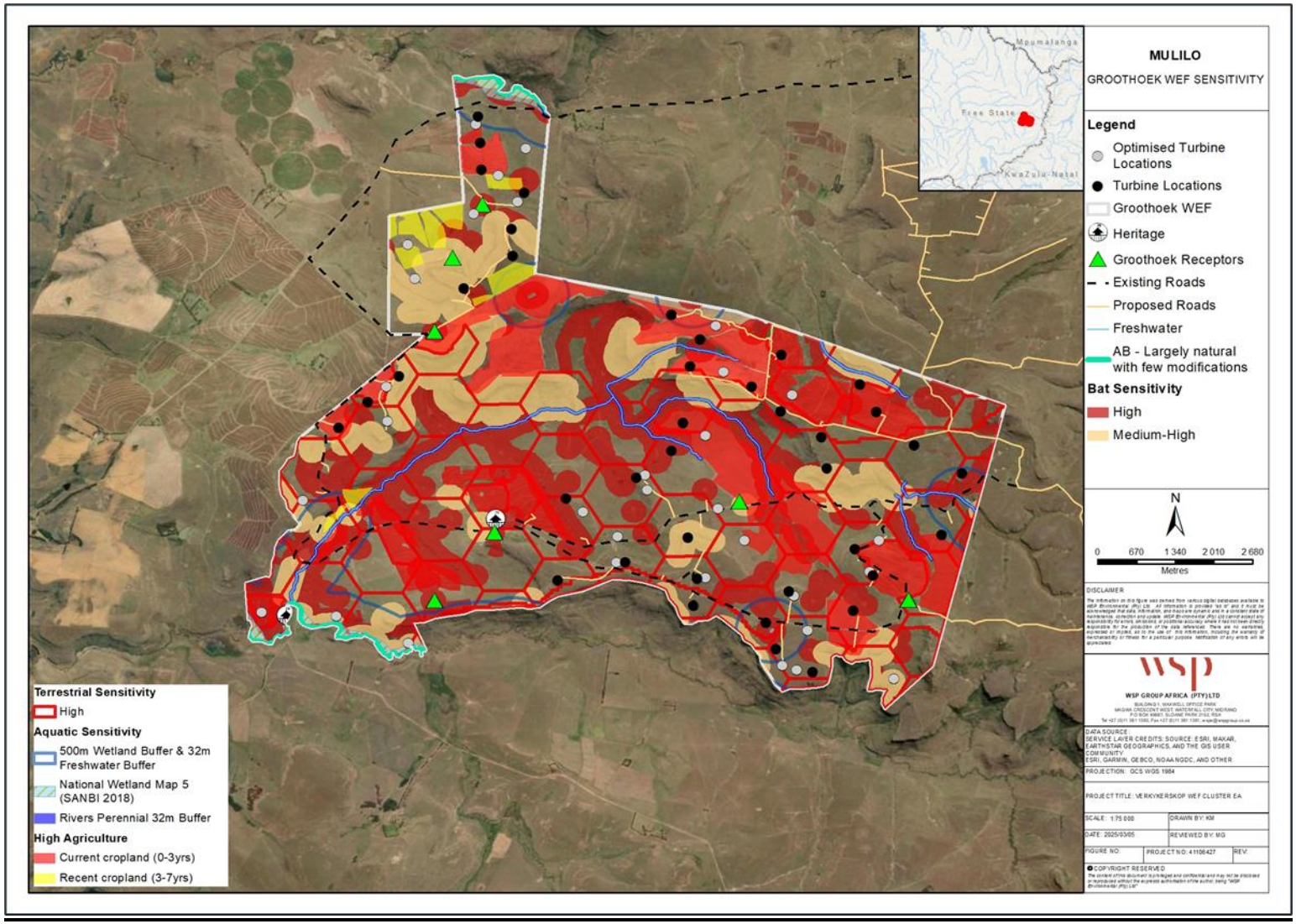

Figure 7-2 – Groothoek WEF - Map illustrating the Preliminary and Optimised Layouts for comparison (excluding avifauna)

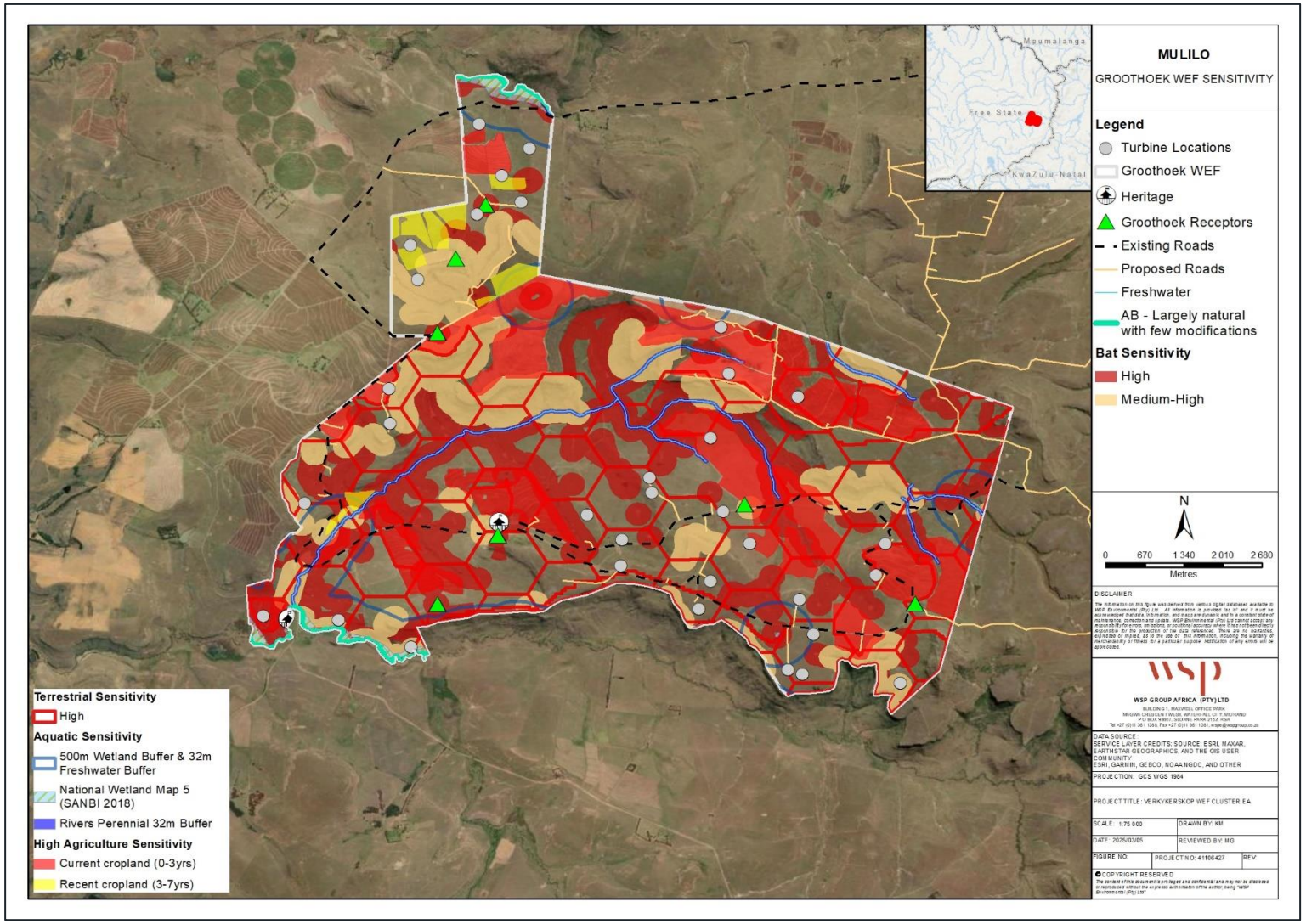

Figure 7-3 – Groothoek WEF - Map illustrating the Optimised Layout (excluding avifauna)

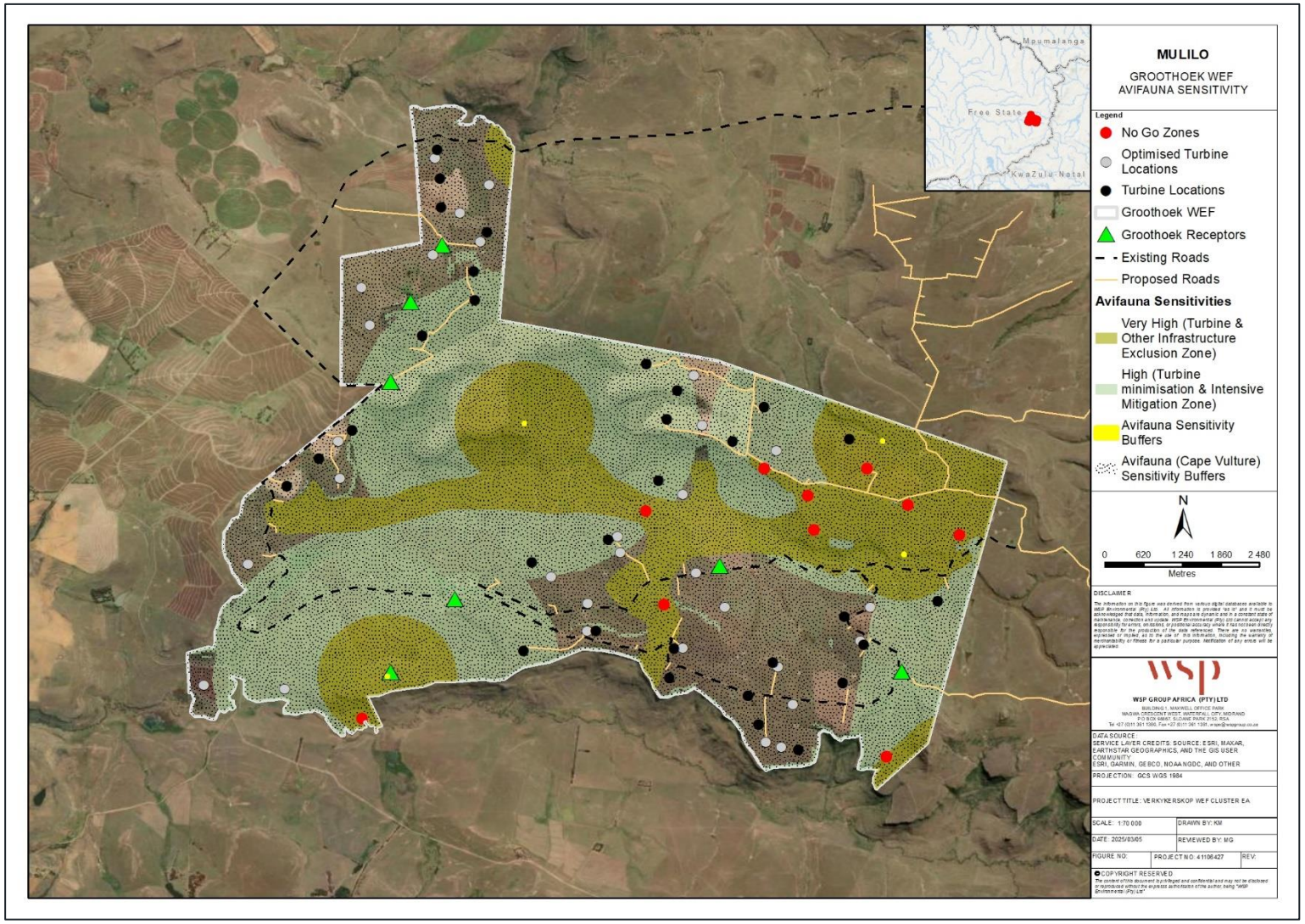

Figure 7-4 – Groothoek WEF - Avifauna Sensitivity Map overlain by the Preliminary and Optimised Layouts for comparison

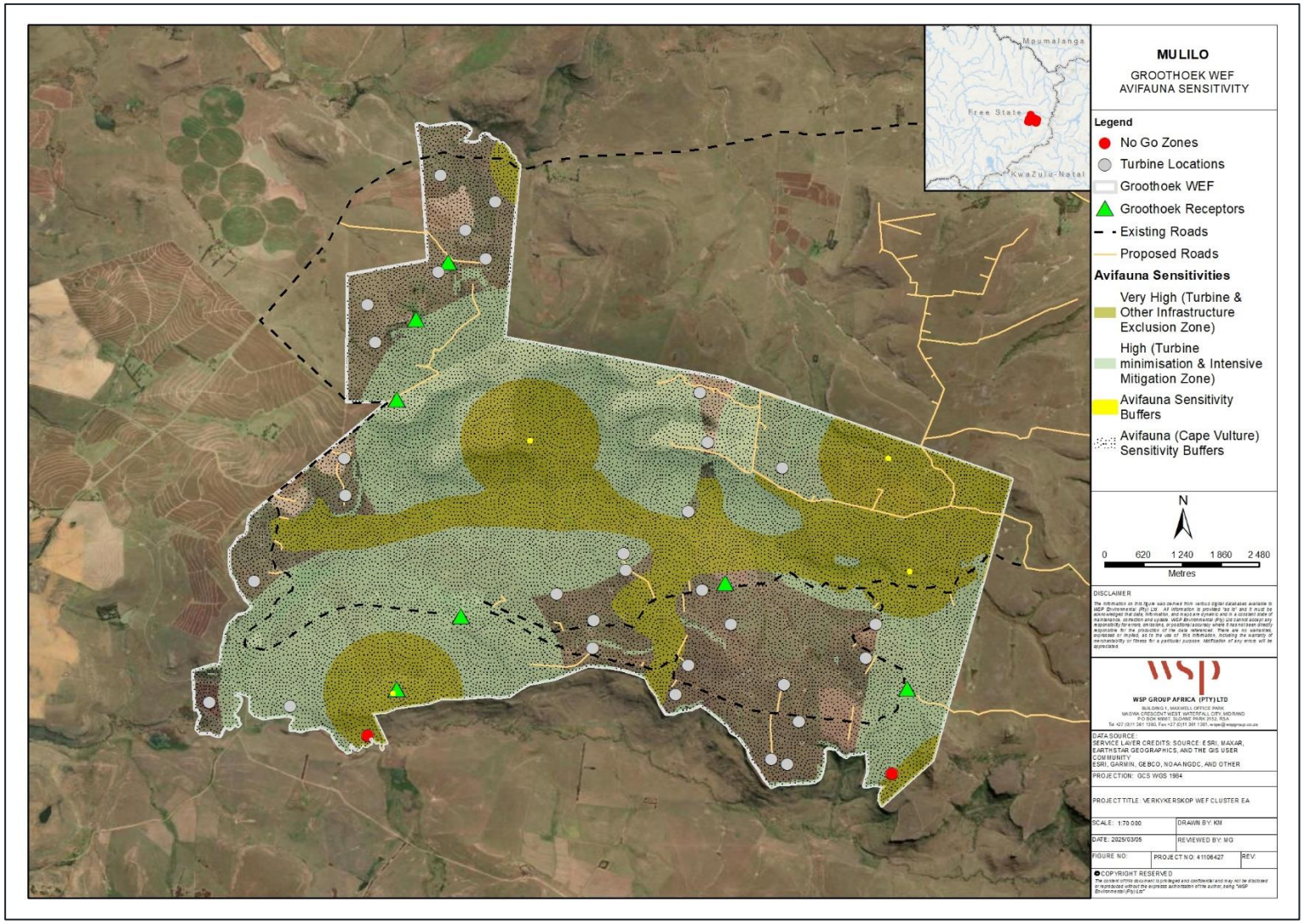

Figure 7-5 – Groothoek WEF - Avifauna Sensitivity Map overlain by the Optimised Layout

8 POTENTIAL IMPACTS

8.1 IDENTIFICATION OF POTENTIAL IMPACTS

The scoping phase of a S&EIR process is aimed to identify potential impacts that are most likely to be significant and which need to be assessed as part of the S&EIR process. The determination of anticipated impacts associated with the proposed development is a key component to the S&EIR process. This Chapter identifies the anticipated environmental and social impacts associated with the proposed project.

The issues identified stem from those aspects presented in **Section 6** and the description of project components and phases as outlined in **Section 3**. Each significant issue identified is to be investigated further during the S&EIR process. Non-significant issues will be scoped out of the study with reasonable consideration given within the Scoping Report.

The potential environmental and social impacts of the Proposed Project Facility have been identified at a high level and are discussed in **Table 8-1**. These impacts and mitigation measures will be further assessed during the EIA Process. The Impact Significance Assessment Rating for these impacts are included in **Section 8.3**.

*It must be noted that the mitigation measures outlined in **Table 8-1** are preliminary mitigation measures suggested at this stage. They do not constitute final recommendations, and further investigation is required during the EIA phase.*

Table 8-1 - Potential impacts (C = Construction Phase, O – Operational Phase, D = Decommissioning Phase)

Aspect	Impact	C	O	D	Mitigation Measures
Agriculture					
Soil and land capability	Loss of agricultural potential	✓			• A system of storm water management, which will prevent erosion on and downstream of the site, will be an inherent part of the engineering design 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. As part of the system, the integrity of the existing contour bank systems of erosion control on croplands, where they occur on steeper slopes, must be kept intact. • 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 30 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 cut surface.
Aquatic Biodiversity					

Aspect	Impact	C	O	D	Mitigation Measures
Water Quality deterioration	Vegetation clearing and soil disturbances may result in bare land which increase surface runoff, soil erosion and subsequently, the amount contaminants from the construction site as well as adjacent agricultural activities entering the associated watercourses. Furthermore, the establishment of infrastructure will increase impervious surfaces and thus possibly exacerbate the cascade of events that result from bare land as explained above. Ultimately, water quality at the affect watercourses may be compromised. This impact is definite with a residual impact of high significance. The application of the recommended mitigation measures may however reduce both the potential consequence and the probability of the impact occurring as predicted, resulting in a residual impact of low significance.	✓			• Limit vegetation removal to the infrastructure footprint area only. Where removed or damaged, vegetation areas (riparian or aquatic related) should be revegetated as soon as possible. • Bare land surfaces downstream of construction activities must be vegetated to limit erosion from • the expected increase in surface runoff from infrastructure. • Environmentally friendly barrier systems, such as silt nets or, in severe cases, use trenches downstream from construction sites to limit erosion and possibly trap contaminated runoff from construction. • Storm water must be diverted from the construction site and managed in such a manner to disperse runoff and prevent the concentration of storm water flow. • Water used at construction sites should be utilised in such a manner that it is kept on site and not allowed to run freely into nearby watercourses. • Construction chemicals, such as cement and hydrocarbons should be used in an environmentally safe manner with correct storage as per each chemical's specific storage descriptions. • All vehicles must be frequently inspected for leaks.
Increase in sediment load due to earth works and subsequent loss of habitat.	Sediment load to the adjacent watercourses may increase due to increase in surface runoff and soil erosion caused by vegetation clearance and establishment of infrastructure. An increase in sediment load within watercourses may result in various impacts such as an increase in turbidity (i.e., suspended solids) that may affect biology of biota. Deposition of increased volume of sediment may also change benthic habitat. The latter impacts may therefore be limiting to aquatic biota and ultimately affect aquatic biodiversity of the affected systems. Prior to mitigation measures, the impact is definite, and it may result in a residual impact of high significance. The probability of the impact can be reduced to probable with	✓			

Aspect	Impact	C	O	D	Mitigation Measures
	moderately severe consequence and ultimately a residual impact of low significance.				
Establishment and spread of alien and invasive species.	Disturbances caused by vegetation clearing and earth works during construction, as well as moving machinery increase the risk of introducing alien invasive plant species (AIS) that may invade riparian zones. Most AIS are characterised by high water uptake which may ultimately decrease water volume and flow within rivers, thereby altering the hydrological regime of the watercourses. This impact is highly probable with a residual impact of medium significance prior to mitigation measures. Probability of the impact occurring may be reduced to probable and potential consequence to moderately severe and ultimately residual impact of low significance.	✓			
Water quality deterioration	Contaminated water emanating form from the operations site (i.e., waste storage facilities) may spill into the bare lands or paved surfaces and ultimately reach the adjacent water courses, thus compromising water quality in the affected systems. In the absence of proper stormwater management infrastructure, water used on site also have the potential to increase flow rates and contaminants in the associated watercourses. These influences will directly impact on water quality and aquatic habitat which in turn will negatively affect the aquatic biota. Before mitigation measures, the impact is highly probable with a residual impact of medium significance. Although the application of the recommended mitigation measures may reduce the probability of the impact occurring, the potential consequence will remain the		✓		• All vehicles must be frequently inspected for leaks. • No material may be dumped or stockpiled within any rivers or drainage lines in the vicinity of the proposed project. • All waste must be removed and transported to appropriate waste facilities; and • High rainfall periods (usually November to March) should be avoided during the construction phase to possibly avoid increased surface runoff in attempt to limit erosion and the entering of external material (i.e. contaminants and/or dissolved solids) into associated aquatic system. • Bi-annual aquatic ecosystem monitoring for duration of construction, and possibly during operation should significant impacts be predicted

Aspect	Impact	C	O	D	Mitigation Measures
	same. The residual impact will however be reduced low significance.				
Establishment and spread of alien and invasive species	The potential establishment of alien invasive species in, and immediately adjacent to, the proposed development footprint will continue to be an impact of concern during the operational phase. Without mitigation, the consequence of the potential impact is considered moderately severe, while the possibility of the impact occurring is highly probable, amounting to a potential impact of low significance. With the continued implementation of an active alien species control programme during the operational phase, the probability of the impact occurring can be reduced, resulting in a residual impact of low significance.		✓		
Wetlands					
Loss of wetland habitat	Clearing of vegetation and establishment of infrastructure of the proposed project may lead to a permanent loss of wetland vegetation within the existing wetlands. This impact is definite considering that the proposed project traverses a portion of adjacent wetlands habitats. The consequence of the impact and ultimately its significance prior to mitigation measures are sevre and high respectively also as it is considered irreversible and permanent and will have indirect impacts on the catchment yield as well as loss of habitat for vulnerable wetland species with a potential to occur on site. The implementation of mitigation measures can however reduce it to an impact of medium significance	✓			• Identification of areas of undisturbed, natural grassland and wetland habitat should be avoided to the extent possible. • Areas of direct loss must be addressed via additional conservation actions/offsets as required. • A loss/disturbance buffer zone of at least 100 m should be maintained between the maximum extent of construction works and the outer boundary of wetlands and riparian zones. • The development footprints should be clearly marked out with flagging tape/posts in the field and vegetation clearing should be restricted to the proposed project footprints only, with no clearing permitted outside of these area.

Aspect	Impact	C	O	D	Mitigation Measures
Changes in wetland health/ functioning	Bulk earthworks involved in site development in the immediate catchment of wetlands have the potential to cause indirect impacts on wetland habitat through compaction/removal of recharge or interflow soils, as well as increased sediment deposition to downslope wetland ecosystems through stormwater runoff. If not carefully managed, the potential impact could be severe, and the likelihood highly probable, resulting in an impact of medium significance. The significance of the impact can however be reduced to medium with the implementation of the proposed mitigation measures	✓			• Locate all waste disposal or storage facilities and temporary construction infrastructure at least 50 m from the edge of delineated wetlands.
Contamination of riparian systems	Bare lands, paved surfaces and water used on site have the potential to increase flow rates, sediment input, erosion and contaminants in the associated watercourses if allowed to flow freely from the MRA. Spills of sand may occur into watercourses during the transportation of ROM. These influences will directly impact on water quality and aquatic habitat which in turn will negatively affect the aquatic biota. The impact is considered highly probable during the construction phase, and could be severe, resulting in an impact of high significance. The recommended mitigation measures could reduce the likelihood of the impact occurring and ultimately reduce the residual impact to low significance	✓			• Wetland/river crossings should be constructed utilizing designs that ensure that hydrological integrity of the affected wetlands is preserved, and natural flow regimes are maintained (i.e. no impoundment upstream of crossings, or flow concentration downstream of crossings. • Ideally construction activities within wetlands should take place in winter (during the dry season). Where summer construction is unavoidable, temporary diversions of the streams might be required. • Install erosion prevention measures prior to the onset of construction activities. Measures should include low berms on approach and departure slopes to crossings to prevent flow concentration, sediment barriers along the lower edge of bare soil areas, placement of hay bales around the within wetland construction areas, and re-vegetation of disturbed areas as soon as possible.
Soil erosion	The removal of wetland vegetation for the construction of the proposed development could result in an increase	✓			• Install erosion prevention measures prior to the onset of construction activities. Measures should include low

Aspect	Impact	C	O	D	Mitigation Measures
	of bare soil/surfaces in the study area which could lead to increased runoff in and around the study area which ultimately results in soil erosion. The impact of soil erosion is considered highly probable during construction and could have a moderate consequence on wetland soil, resulting in a medium impact significance without mitigations. With the implementation of mitigation measures this probability of this impact can be reduced and ultimately resulting in a residual impact of low significance				berms on approach and departure slopes to crossings to prevent flow concentration, sediment barriers along the lower edge of bare soil areas, placement of hay bales around the within wetland construction areas, and re-vegetation of disturbed areas as soon as possible.
Establishment and spread of alien invasive species.	Movement of vehicles and equipment during the construction phase could have a high probability of spreading of alien invasive species. The consequence of this impact is however moderate, resulting in a medium Impact significance prior to mitigation and low impact significance post mitigation through the lowering of the probability of occurrence.	✓			• An alien and invasive species management plan should be developed for the Project, which includes details of strategies and procedures that must be implemented on site to control the spread of alien and invasive species. A combined approach using both chemical and mechanical control methods, with periodic follow-up treatments informed by regular monitoring, is recommended.
Soil erosion	The increased presence of hardened surfaces in the study area could potentially exacerbate soil erosion, through surface run off. This impact is probable with a moderate impact severity resulting in a medium significance. With the implementation of mitigation measures this impact can be expected to have low significance on wetland soils		✓		• Install erosion prevention measures prior to the onset of construction activities. Measures should include low berms on approach and departure slopes to crossings to prevent flow concentration, sediment barriers along the lower edge of bare soil areas, placement of hay bales around the within wetland construction areas, and re-vegetation of disturbed areas as soon as possible.
Spread of alien and invasive species	The potential establishment of alien invasive species in, and immediately adjacent to, the proposed development footprint will continue to be an impact of concern during the operational phase. Without mitigation, the consequence of the potential impact is considered		✓		• An alien and invasive species management plan should be developed for the Project, which includes details of strategies and procedures that must be implemented on site to control the spread of alien and invasive species. A combined approach using both chemical and mechanical

Aspect	Impact	C	O	D	Mitigation Measures
	moderately severe, while the possibility of the impact occurring is highly probable, amounting to a potential impact of medium significance. With the continued implementation of an active alien species control programme during the operational phase, the probability of the impact occurring can be reduced, resulting in a residual impact of low significance.				control methods, with periodic follow-up treatments informed by regular monitoring, is recommended.
Water quality deterioration and contamination of wetland soils	Contaminated water emanating form from the operations site (i.e., waste storage facilities) may spill into the bare lands or paved surfaces and ultimately reach the adjacent water courses, thus compromising water quality in the affected systems. Before mitigation measures, the impact is highly probable with a residual impact of medium significance. Although the application of the recommended mitigation measures may reduce the probability of the impact occurring, the potential consequence will remain the same. The residual impact will however be reduced low significance.		✓		• Monitoring of wetland health must be conducted within one year of completion of construction, to measure any changes to the baseline status and ensure that recommended mitigation measures are sufficient to address any significant impacts. The PES/EIS of the existing wetlands must also be reviewed during the monitoring period.
Animal Species					
Injury and mortality of faunal species of conservation concern	The bulk earthworks involved in site development have the potential to injure/kill individual ground-dwelling and relatively slow-moving faunal species, which will be at risk and vulnerable to heavy machinery movements and site clearance activities. Without mitigation, the likelihood of this impact occurring is highly probable and the consequence of the potential impact could be severe, amounting to an impact of medium significance. Once mitigation measures are implemented, principally avoiding/minimising	✓			• High rainfall periods (usually November to March) should be avoided during the construction phase to possibly avoid increased surface runoff in attempt to limit erosion and that may modify the existing habitat • Development of biodiversity management/action plan. • Specific provision for biodiversity conservation, including details of any required offsets, should be made in the project BMP/BAP, in alignment with the objectives of the MBSP (2019).

Aspect	Impact	C	O	D	Mitigation Measures
	construction/excavation in high-risk habitats for ground-dwelling species, the probability of the impact occurring can be reduced, resulting in a residual impact of low significance.				• Inclusion of a practical framework and schedule, details of key performance indicators, recommended monitoring protocols for the delivery of mitigation measures, and costs for implementation in the BMP/BAP is recommended. • Establish monitoring requirements. • The presence of alien and invasive flora species should be documented prior to the commencement of the development of the infrastructure and rehabilitation activities, and the baseline case used as a benchmark against which the spread of these species can be monitored. Annual monitoring inspections should identify target areas for clearing and subsequent rehabilitation/re-vegetation programmes. • A record of fauna mortalities/injury due to interactions with Project infrastructure/activities should be kept on site and regularly reviewed to inform the need for implementation of any additional mitigation measures.
Disturbance and fragmentation of faunal habitat	The construction phase of the Project will result in fragmentation of existing habitat that may be of importance on a local level for maintenance of landscape connectivity for fauna movements and foraging. Most of the project area is however transformed. Thus, the consequence of the potential impact could be moderately severe, and the likelihood highly probable, amounting to an impact of medium significance without mitigation. Once mitigation measures are implemented, the probability of the impact occurring can be reduced, resulting in a residual impact of Low significance	✓			
Injury and mortality of faunal species	Increased vehicle traffic in the study area during the operation phase may pose a risk of injury and existing mortality of fauna species. The consequence of the potential impact on fauna during the operational phase is expected to be low given the existing levels of traffic movements and sensory disturbance at the site, and the effect of the preceding construction works. The impact would occur throughout the operation phase, affect fauna at a local scale and is considered highly probable, resulting in an impact of moderate significance prior to mitigation. The application of the recommended mitigation measures reduces both the potential consequence and the probability of the impact occurring as predicted, resulting in a residual impact of low significance		✓		

Aspect	Impact	C	O	D	Mitigation Measures
Plant Species					
Direct loss and disturbance of natural habitat and associated species of conservation of concern (SCC)	The construction of the proposed infrastructure and access roads will result in the direct and permanent loss of areas of natural habitat, particularly wetlands which have been suspected to support some protected species. Therefore, this impact is considered highly probable, and the consequence could be very severe since permanent loss of natural habitat cannot be mitigated. The significance of the impact will then be high. However, assuming that the mitigation hierarchy is implemented at final design stage to ensure that the potential footprint of infrastructure/activities within natural habitat areas is avoided/minimised to the maximum extent possible, it is expected that high significance impacts will be restricted to a relatively small proportion of the Project area.	✓			• Avoid undisturbed areas, particularly wetland habitat to the extent possible. A loss/disturbance buffer zone of at least 100 m should be maintained between the maximum extent of construction works and the outer boundary of wetlands and riparian zones. • Vegetation clearing should be restricted to the proposed project footprints only, with no clearing permitted outside of these areas. • Install erosion prevention measures prior to the onset of construction activities. Measures should include low berms on approach and departure slopes to crossings to prevent flow concentration, sediment barriers along the lower edge of bare soil areas, placement of hay bales around the within wetland construction areas, and re-vegetation of disturbed areas as soon as possible. • High rainfall periods (usually November to March) should be avoided during the construction phase to possibly avoid increased surface runoff in attempt to limit erosion and that may modify the existing habitat. • An alien and invasive species management plan should be developed for the Project, which includes details of strategies and procedures that must be implemented on site to control the spread of alien and invasive species. A combined approach using both chemical and mechanical control methods, with periodic follow up treatments informed by regular monitoring, is recommended. • Existing stands of alien and invasive species should be removed from the LSA prior to commencement of construction. • Development of biodiversity management/action plan.
Establishment and spread of alien and invasive species.	Disturbances caused by vegetation clearing and earth works during construction will exacerbate the establishment and spread of AIS. Alien plant infestations can spread exponentially, suppressing, or replacing indigenous vegetation. This may result in a breakdown of ecosystem functioning and a loss of biodiversity. Without mitigation, the consequence of the potential impact is considered moderately severe, while the possibility of the impact occurring is highly probable, amounting to a potential impact of medium significance. With the development of an auditable AIS Management Plan for the project, and the strict implementation of the recommended active control and monitoring measures	✓			

Aspect	Impact	C	O	D	Mitigation Measures
	throughout the construction phase, the probability of the impact occurring can be reduced, resulting in a residual impact of low significance				• Specific provision for biodiversity conservation, including details of any required offsets, should be made in the project BMP/BAP, in alignment with the objectives of the MBSP (2019). • Inclusion of a practical framework and schedule, details of key performance indicators, recommended monitoring protocols for the delivery of mitigation measures, and costs for implementation in the BMP/BAP is recommended. • Establish monitoring requirements. • The presence of alien and invasive flora species should be documented prior to the commencement of the development of the infrastructure and rehabilitation activities, and the baseline case used as a benchmark against which the spread of these species can be monitored. Annual monitoring inspections should identify target areas for clearing and subsequent rehabilitation/re-vegetation programmes. • A record of fauna mortalities/injury due to interactions with Project infrastructure/activities should be kept on site and regularly reviewed to inform the need for implementation of any additional mitigation measures.
Spread of alien invasive species	The potential establishment of alien invasive species in, and immediately adjacent to, the proposed development footprint will continue to be an impact of concern during the operational phase. Without mitigation, the consequence of the potential impact is considered moderately severe, while the possibility of the impact occurring is highly probable, amounting to a potential impact of medium significance. With the continued implementation of an active alien species control programme during the operational phase, the probability of the impact occurring can be reduced, resulting in a residual impact of low significance.		✓		
Avifauna					
Loss or Alteration of Habitat	Loss or alteration of habitat is mainly associated with the construction of access roads, the turbine footprint itself, the electrical transmission infrastructure and the Battery Energy Storage Facility. Consequently, the proportion of habitat loss relative to the overall project area is typically small, compared to other developments (e.g. solar farms).	✓			• Complete spatial avoidance of the identified core habitat areas for threatened high altitude species • Effective and gazetted conservation of these and other remaining natural grasslands through conservation stewardship and appropriate land management practices could reduce the significance of the residual impact. • Offsetting

Aspect	Impact	C	O	D	Mitigation Measures
					• Based on TBC's recommendation Mulilo has recently commissioned Dr. Robin Colyn of Afri-Avian to conduct detailed habitat modelling and acoustic monitoring for Sensitive Species 23. Additionally, Afri-Avian have been tasked with conducting detailed habitat suitability modelling for several selected threatened species. It is recommended that these additional modelling exercises should include as a minimum species such as such as Rudd's Lark, Botha's Lark, Yellow-breasted Pipit, Denham's Bustard, Southern Bald Ibis and Wattled Crane.
Roadkill and other mortalities	Roadkill and other mortalities due to the influx of people and motor vehicle movement during construction will invariably increase bird-vehicle collisions.	✓			• Signpost the entry of roads into areas zoned as core habitat for threatened high altitude species as "Environmentally Sensitive Area Reduce Speed". • All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limit (40km/h), to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.
Sensory disturbance during construction	Sensory disturbance during construction; the greatest and most potentially direct construction-related sensory threat would be the potential disturbance of Southern Bald Ibis from their roosts, particularly breeding colonies at Roosts 2, 6 and 11.	✓			• Spatial avoidance. Adhering to the prescribed nest and roost buffers. • Temporal avoidance. Timing construction is to take place outside the critical breeding window for Southern Bald Ibis (near breeding roosts) and threatened high-altitude grassland species.
Collisions with turbines	Collisions with turbines due to the high abundance and diversity of priority species (which included 25 red-listed species) recorded within the Groothoek WEF that		✓		• Spatial Avoidance. The most important mitigation measure in this regard centres on spatial planning. All infrastructure should be completely avoided in areas

Aspect	Impact	C	O	D	Mitigation Measures
	suggest a high potential risk for significant mortalities during operation.				designated in the sensitivity map as Very High sensitivity. Infrastructure should be minimised unless completely unavoidable in all areas of High sensitivity. • Temporal avoidance. One aspect that should be thoroughly investigated would be the possibility for curtailment during peak flight times. The vantage point data revealed a strong diurnal variation in flight activity of priority species. By far the majority of flight activity occurred between 09:30 and 12:30 in winter and 08:30 to 11:30 in summer. Another peak occurs for about an hour before and following sunset when most priority species, particularly Southern Bald Ibis and Martial Eagle, commute back from foraging. Complete shutdown of the entire wind farm, or the shutdown of the majority of selected “risky” turbine locations, during these times will drastically reduce the risk of turbine collisions. Another key event to consider is the annual migration of Amur Falcon which peaks for only a few days. Observer-based shutdown could be critical to the avoidance of mass strikes. • Any turbines placed in High sensitivity areas must be subject to intense mitigation measures such as intelligent camera systems (e.g. Identiflight or Bioseco), automated curtailment using Artificial Intelligence (AI) models and GPS flight data, radar and bird spotters to inform shutdown on demand, blade painting. Given the site's sensitivity, as a minimum, all planned turbines which currently overlap Very High buffers should be removed from the turbine layout. • Observer led shut down on demand (SDOD) should be implemented. It is, however, important to note that the efficacy of this system may be limited by the extreme and highly erratic climatic conditions on site. Cloud, mist and rain can dramatically hamper visibility and,

Aspect	Impact	C	O	D	Mitigation Measures
					therefore, the efficacy of this system for several days at a time. However, vultures and other priority species were still observed flying in these conditions. It is recommended that selected turbines may need to be shut down in periods of intense mist and cloud cover. • One blade should be painted red. Anticipate and budget for communications and authorisations from CAA. • A Cape Vulture Food Management Programme will need to be designed and implemented to ensure all dead livestock/wildlife on site are removed as soon as possible and transferred to designated vulture restaurants sufficiently far away from the WEF. This would need to be an intensive undertaking by a team of full-time rangers working in close radio communication with the farmers. • Develop a contingency mitigation budget to cater for significant mortality events. This budget should allow for research into and effective implementation of adaptive management strategies such as human-based turbine shutdown on demand, habitat alteration, bird deterrence from site, and any others identified as feasible. • A Biodiversity Management Plan (BMP) must be compiled for the project by an ornithologist prior to construction, outlining critical thresholds for fatalities and the appropriate management response. • Ensure continued collaboration with relevant NGOs such as VULPRO, BirdLife South Africa and the Endangered Wildlife Trust (EWT). It is imperative that these organisations be given ample opportunity to provide information (e.g. tracking data, models and reports) that is critical to informing project planning regarding feasibility.

Aspect	Impact	C	O	D	Mitigation Measures
					• Track martial eagles within the project area. Mulilo recently commissioned a study of this nature, and Dr. Gareth Tate of EWT has already captured and fitted a GPS logger on the first male eagle (May 2024). • Track Southern Bald Ibis. Dr Carina Pienaar is currently busy tracking bald ibises from the Witkoppe Roost. It is recommended that she be contacted to consider fitting GPS loggers to fledglings from within the VWC. • Collision Risk Modelling. Mulilo is currently engaging with TBC and Afri-Avian to design and compile a detailed collision risk model for five species anticipated most prone to collision with the proposed wind turbines.
Collisions and Electrocutions with Electrical Transmission Lines and Auxiliary Infrastructure	Collisions and electrocutions with electrical transmission lines and auxiliary infrastructure.		✓		• Install Eskom-approved flappers or coils (flight diverters), along the entire length of the 500 m line at no more than 10 m intervals. Flight diverter structures should ideally alternate between light and dark shades to maximise visibility and contrast against background as seen from powerline level. The structures must be installed as the powerlines are being spanned. This will drastically help to increase the visibility of transmission lines especially the thinner earth line with which most collisions tend to be associated (Martin et al. 2010). • Anti-perch devices should be intensified on main Eskom powerlines to further reduce perch suitability. • All power cables between panels and the battery energy storage system (BESS) within the project area should be thoroughly insulated and buried in demarcated corridors. • All above ground electrical transmission infrastructure should be fitted with the latest Eskom approved anti-bird structures and anti-collision line marking devices.

Aspect	Impact	C	O	D	Mitigation Measures
Sensory Disturbance	Sensory disturbance to birds during operation centres on the noise the turbines generate.		✓		• Spatial Avoidance. Avoid the placement of turbines in areas identified as core habitats identified for threatened high-altitude species. • Temporal Avoidance. Employ temporal avoidance measures. Attempt as far as possible to conduct most of the high-intensity construction activities during winter to minimize disturbance of avifauna during sensitive life stages such as lekking, courting, nesting and fledging). Ideally activities and operations should take place during the least sensitive periods (migration, nesting and breeding periods, mainly July-September).
Effect on migratory and congregatory species	Effect on migratory and congregatory species.		✓		• Due to the seasonal arrival of large migratory flocks, it is possible to employ a combination of observer-based shut-down on demand and temporal avoidance to reduce the probability of collisions. The potential for, as well as the possible magnitude and severity of a significant collision event (e.g., with Amur Falcons) at Groothoek is lower than some of the other WEFs in the VWC but should still be regarded as potentially significant.
Bats					
Roost disturbance or destruction.	During construction of the proposed WEF Cluster, bat roosts (roosting bats and/or roost sites) in buildings, rocky places, and/or woody vegetation, could be disturbed or destroyed (e.g., from vegetation clearing, excavation works, blasting, and noise) if overlooked and/or not adequately avoided.	✓			• All High sensitive areas (especially rocky areas, buildings, and dense woody vegetation) should be avoided

Aspect	Impact	C	O	D	Mitigation Measures
Forging habitat	Destruction, degradation, and fragmentation of and displacement from foraging habitat. Construction of the WEF Cluster will cause widespread destruction, degradation, and fragmentation of natural terrestrial habitat, which is used by bats for foraging	✓			• Infrastructure should be constructed in already-transformed areas such as quarries or extraction pits, cultivated, fallow, and old fields, and eroded and other barren foraging areas, where possible. • The extent (total area) of all new roads should be minimized, the total number of turbines should be minimized, light pollution should be minimized, and disturbed natural areas should be rehabilitated post-construction.

Bat Fatalities	Bat fatalities from collision and barotrauma, and population declines.		✓		• To mitigate this impact pre-construction and during planning all High sensitive areas should be avoided by turbine hardstands and blades, all Medium-High sensitive areas should be avoided where possible, and Mulilo should plan to:
					  • i) minimize the turbine Area of Influence i.e. the minimum convex polygon for all turbines comprising each WEF;
					  • ii) minimize the total rotor swept area; and
					  • iii) maximize the lowest reach of the turbine blades.
					To mitigate this impact during operation, bat fatality mitigation measures may need to be implemented (depending on the results of 12-month pre-construction bat monitoring), and proper bat fatality monitoring and adaptive management of bat fatalities must be performed.

Aspect	Impact	C	O	D	Mitigation Measures
Decline or loss of bat ecosystem services.	If bat populations in the study region start declining because of roost disturbance, loss of and/or displacement from foraging habitat, and/or high bat fatalities, the ecosystem services that the bats provide (including in nearby protected areas) will be impacted.	✓	✓		• Mitigation of this potential impact will depend on effective mitigation of the impacts mentioned in the specialist report.
Heritage and Archaeology and Palaeontology					
Loss of heritage resources	• Disturbance to Known Cultural Resources • Construction activities may lead to disturbance or destruction of cultural resources (archaeological and historical remains and sacred sites e.g. graves) should the development footprint encroach on identified cultural/heritage sites.	✓			• Chance find of Cultural Resources • Earthworks may accidentally expose unidentified subsurface fossil remains. This will result in a lost opportunity to preserve local cultural heritage and historical records should appropriate management measures not be in place (e.g. Chance Find Procedure).
Traffic					
Temporary increase in traffic	Increase in traffic due to construction vehicles causing potentially negative impact on external traffic as well as damage to road surfaces.	✓		✓	• Source equipment, machinery and material locally as far as possible. • Stagger deliveries of components to site and scheduled to occur outside of peak traffic periods as much as possible. • Regular maintenance of gravel roads located within the site boundary, including the access road to the site. • The use of existing licensed quarries near the site as much as possible. • Staff trips to occur outside of main peak traffic periods as far as possible. • Regular monitoring of road surfaces to address any damage caused by construction vehicles timeously
Dust and Noise pollution	Increase in dust and noise pollution through construction vehicles.	✓		✓	

Aspect	Impact	C	O	D	Mitigation Measures
Increase in traffic	Slight increase in traffic due to permanent staff and irregular maintenance trips to and from site during the life span of the wind farm.		✓		• None.
Visual					
Construction activities	Presence of visually intrusive construction/decommissioning related activities and equipment in the landscape	✓		✓	• Ensure all construction areas are appropriately maintained and kept in tidy order • Reduce the number and size of material laydown and waste storage areas to the extent feasible, and barricade these from view with shade netting/similar if needed • Remove accumulated waste material and unused equipment from site as frequently as is feasible • Repair unsightly and ecologically detrimental erosion damage to steep or bare slopes as soon as possible and re-vegetate these areas using a suitable mix of indigenous grass species
Airborne dust	Airborne dust due to construction/decommissioning activities and resultant dust settling onto surrounding landscape	✓		✓	• Water down construction roads and large bare areas as frequently as is required to minimise airborne dust • Enforce a 40 km/h speed limit on site for all vehicles • Monitor dust fallout if any complaints are received, using appropriate dust monitoring programme
Presence of turbines, other infrastructure	Reduction in visual resource value due presence of visually intrusive wind turbines and other project infrastructure in the landscape.		✓		• Employ micro-siting and orientation of turbines and other infrastructure to group with existing infrastructure and already disturbed areas
Glare and Flicker	Glare due to sunlight reflection from smooth surfaces, as well as flicker from spinning turbine blades		✓		• Employ micro-siting and orientation adjustment of individual towers to ensure glare and flicker impacts to resident receptors (on-site and adjacent landowners) or

Aspect	Impact	C	O	D	Mitigation Measures
					transient receptors (roads bordering the site) are reduced
Light pollution	Light pollution at night due to safety lighting on top of turbines, and security lighting		✓		• Utilise security lighting that is movement activated rather than permanently switched on, to prevent unnecessary constant illumination • Plan the lighting requirements of the facilities to ensure that lighting meets the need to keep the site secure and safe, without resulting in excessive illumination • Reduce the height and angle of illumination from which lights are fixed as much possible while still maintaining the required levels of illumination • Identify zones of high and low lighting requirements, focusing on only illuminating areas to the minimum extent possible to allow security surveillance • Avoid up-lighting of structures by rather directing lighting downwards and focussed on the area to be illuminated • Fit all security lighting with 'blinkers' or specifically designed fixtures, to ensure light is directed downwards while preventing side spill. Light fixtures of this description are commonly available for a variety of uses and should be used to the greatest extent possible
Social					
Job Creation	The construction phase is estimated to be 36 months per 240 MW wind farm. There will be four wind farms in total. The number of employees for the construction phase is estimated to be approximately 2000. Furthermore, the project requires predominantly local South Africans to be employed during construction. Most	✓			• To enhance job creation, the project should prioritise local recruitment for low-skilled work and invest in skills development for locals to improve their competitiveness in the job market, spread across the development of the Verkykerskop WEF cluster, where possible.

Aspect	Impact	C	O	D	Mitigation Measures
	workers will be low-skilled, with approximately 60% low-skilled and 40 % for semi-skilled and skilled, respectively. The facility's construction will create approximately 2,000 equivalent full-time jobs. The job creation projection indicates that many low-skilled persons will be employed. Job creation will have a potential very high positive impact.				
	The total number of employment generated during the operational phase is estimated at 30. Furthermore, the project requires that local South Africans be employed during construction. Most workers will be low-skilled, with approximately 30 – 40 % semi-skilled. The job creation projection indicates that many low-skilled persons will be employed. The impact significance is rated as a potentially high positive impact		✓		
The Influx of Job Seekers	Based on a report by Statistics South Africa in 2023, the unemployment rate during the first quarter of the year stood at 32.9% (Statistics South Africa, 2023). This unemployment rate poses a significant challenge for job seekers who may feel compelled to relocate to areas experiencing development to secure employment opportunities. However, such a move can potentially negatively affect the local community. There will also be added pressure on the existing municipal infrastructure and services. This pressure includes an increase in traffic, water usage and housing demands. Additionally, the influx of people from different cultures and languages may impact the local culture, and family structures, leading to a sense of displacement for locals. The impact significance is rated as highly negative.	✓			• Recruitment procedures should prioritise local employment to limit influx. Local skill development programmes must be implemented for targeted local skill development that aligns with project needs and addressing specific community impacts.

Aspect	Impact	C	O	D	Mitigation Measures
	An increase in job seekers may increase pressure on the existing municipal infrastructure and services. An influx of job seekers includes increased road traffic, water usage and housing demands. The influx of people from different cultures and languages may impact the local culture, language, and family structures, leading to a sense of displacement for the locals. The influx of job seekers can potentially affect the local community negatively. The significance is rated as a negative medium impact.	✓			
Procurement from local businesses for supplies and services.	The project and its employees will require procurement of goods and services for construction and operation. This procurement will increase local economic growth. Local economic growth has the potential to have a medium positive impact.	✓	✓		• The project could partner with local suppliers through procurement programmes to develop local suppliers and enhance this positive impact. Furthermore, the procurement programmes should prioritise local procurement for locally available goods and services • Local businesses should be prioritised to supply goods and services to the project during operations
Loss of agricultural land	The project is located within agriculturally active farm portions. The physical construction of the infrastructure discussed in the project description will require vegetation clearance. The project proponent intends to develop a small portion of the area. A portion of the area will be within the croplands. The loss of farmland could potentially negatively impact the local agricultural sector. The impact is rated as low negative as the disturbed areas will be relatively small.	✓			• The project should limit the construction of infrastructure during planting and harvesting season. Disturbed areas should be kept as small as possible and rehabilitated post-construction phase
Generate income for affected landowners	The proponent will enter into lease agreements with the affected landowners to use the land to construct the proposed wind energy facilities. The affected farmers	✓			• Implement agreements with affected landowners. Where possible, the loss of high-quality agricultural land should be avoided and minimised as far as possible by careful

Aspect	Impact	C	O	D	Mitigation Measures
	are paid a portion of the revenue generated by turbines on their properties. Other infrastructure is compensated with a one time lump sum fee for the servitude. The extra revenue will mitigate the landowner/farmer's livelihood risk posed by the project. The added income is a substantial benefit to the impacted landowner. The impact is rated as medium positive				planning in the final layout of the proposed energy-generating facilities.
Community Health, Safety and Security	The project workers could damage farm fences and buildings, increase crime, theft or killing of livestock, and theft of farm produce. While the creation of jobs is positive, it may also introduce changes in lifestyle, such as multiple sexual relations, which could lead to a higher infection rate of HIV/STIs within the project area. The movement of construction vehicles and increased human activity by workers may have a low negative impact on the community's health, safety and security.	✓			• The project should employ security personnel onsite during construction to implement security. The project should include monthly health talks and coordinate health and safety campaigns to educate personnel and the community on general health, safety and security issues.
	The movement of vehicles and increased human activity may damage infrastructure and increase crime, theft or killing of livestock, and theft of farm produce. It could have a low negative impact on the community's health, safety and security.		✓		• The project should employ security personnel onsite during the operational phase to secure the project and its assets. The project should train its personnel in health and safety. The staff should also receive training on how to interact with locals.
Intrusion impact	The construction and operational activities will result in increased noise and dust and alter the visual aesthetics of the area. The effect is rated to be a medium negative impact.	✓	✓		• The project must implement the measures in the EMPr to mitigate dust emission, noise, and visual impacts. Furthermore, the project must establish an onsite complaints register to record and address complaints regarding noise and dust impacts from the facility's construction. • The project must refer to the approved EMPr to mitigate noise and visual impacts. Furthermore, the project must establish a complaints register onsite to record and

Aspect	Impact	C	O	D	Mitigation Measures
					address complaints about noise and visual impacts arising from the project
Energy Generation	The wind energy generated will be an alternative to coal-powered energy. Energy generation will have a high positive impact because the project will produce renewable energy, less air pollution emissions, and a more reliable energy source for the energy consumer.		✓		• Operations Management Systems must be planned, monitored, and evaluated regularly to ensure that production, financial, human resources and other Key Performance Indicators targets are routinely achieved.
Loss of employment	Employees will have to lose their jobs during the decommissioning phase due to retrenchment, which is unavoidable during this phase. Retrenchment will result in a decrease in employment. The impact is rated as a negative medium impact on employment.			✓	• It is recommended that the project establish a structured employment forum consisting of representatives of employees and organised labour, i.e., labour unions and human resource experts. For effectiveness, the forum must be established during the operational phase. The forum will be responsible for planning fair retrenchment compensation packages, including financial compensation or alternative employment opportunities elsewhere for the retrenched employees. Furthermore, skills development programmes must be incorporated within the retrenchment packages for eligible retrenched employees.
Loss of Livelihood	Employees, business owners, and entrepreneurs will likely lose their livelihoods during the decommissioning phase. The impact is predicted to have a high negative impact on the livelihoods of the receptors.			✓	• It is recommended that skills development programmes be included in the retrenchment packages offered to eligible employees. Skills development will enable them to compete fairly with other job seekers in the market. To facilitate this process, the forum discussed in section 7.3.1 of this report will coordinate with companies looking for employees with the skills retrenched workers possess. • In addition, creating a community engagement forum comprising community leaders, municipal Local

Aspect	Impact	C	O	D	Mitigation Measures
					Economic Development representatives, and local business representatives could be effective. This forum will be a structured organisation that will ensure that affected businesses are developed to continue trading even after the decommissioning phase of the project, enabling these businesses to sustain the market and support economic growth in the area
Geotechnical					
• Soil Erosion	• Increase stormwater velocity. • Increase in soil and wind erosion due to cleared vegetation. • Creation of drainage paths along access tracks and side slopes. • Sedimentation of non-perennial features and excessive dust. •	✓			• Rehabilitation of affected areas (such as revegetation). • Construction of temporary berms and drainage channels to divert surface water. • Minimize earthworks and fills. • Use existing road network and access tracks. • Correct engineering design and construction of gravel roads and culverts/drainage pipes at water crossings. • Control stormwater flow. • Proper moisture and density control during construction of embankments including adequate drainage in design. • Use proper linings on embankments.
Disturbance of fauna and flora	• The displacement of natural earth material and overlying vegetation leading to erosion. • Disturbance on natural fauna and flora ecosystems.	✓		✓	• Limited excavations.
Oil spillages from heavy plant	• Potential groundwater and drainage feature contamination or clearance of structures.	✓		✓	• Vehicle and construction machinery repairs to be undertaken in designated areas with proper soil protection.
Seismic activity	Damage of proposed development.	✓			• Design according to expected peak ground acceleration.

Aspect	Impact	C	O	D	Mitigation Measures
Groundwater:	Potentially undermine foundations and cause damage to structures.	✓			• Identify sources of groundwater and eliminate by detailed design/employ effective groundwater lowering techniques
Slope instability around structures	• Steeply dipping joints in rock or boulders in soil mass may prove treacherous in cuttings and deep foundation excavation leading to collapse of sidewalls. • Collapse of “soft” ground in excavation especially in areas below the water table. Can lead to fatality.	✓		✓	• Avoid steep slopes areas. • Design cut slopes according to detailed geotechnical analysis and adopt appropriate support mechanisms. • Adopt safe wok procedures in excavation.
Acoustic					
Noise Disturbance	Wind turbines have the ability to generate noise, causing disturbance for receptors within close proximity of the turbines. There are a relatively low number of receptors within the Project site area, although some of these are within close proximity (~500 m) of the proposed wind turbines (based on the preliminary layout).	✓	✓	✓	• Planning construction activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to affected local communities. Such information includes: • Proposed working times. • Anticipated duration of activities. • Explanations on activities to take place and reasons for activities. • Contact details of a responsible person on site should complaints arise. • When working near a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible. • Using noise control devices, such as temporary noise barriers and deflectors for high impact activities, and exhaust muffling devices for combustion engines.

Aspect	Impact	C	O	D	Mitigation Measures
					• Selecting equipment with the lowest possible sound power levels. • Ensuring equipment is well-maintained to avoid additional noise generation. • Micro-siting turbines sufficiently away from receptors is the best practical measure to limit annoyance on receptors within the Groothoek WEF site. Should this not entirely be possible, various mitigation measures can be employed during the operational phase (IFC, 2015): • Operating turbines in reduced noise mode. • Selecting turbines with lower noise level specifications. • Building walls/appropriate noise barriers around potentially affected buildings. • Limiting turbine operations above the wind speed at which turbine noise becomes unacceptable in the project-specific circumstances. • Consideration of installing larger capacity wind turbines, limiting the number of turbines to be installed but having the same power generation potential.

8.2 CUMULATIVE IMPACT ASSESSMENT

Cumulative impacts refer to the successive, incremental, and/or combined effects of a project, activity, or action when considered alongside other existing, planned, or reasonably foreseeable developments. The assessment and management of cumulative impacts focus on those impacts that are scientifically significant or of concern to affected communities. While this assessment primarily addresses South African regulatory requirements, elements of internationally recognized standards, such as the IFC Performance Standards, provide valuable context for identifying and mitigating cumulative impacts. These standards will guide alignment during later stages of the project lifecycle.

Cumulative impacts are evaluated within the project's **area of influence**, which includes:

- Areas directly impacted by the project;
- Surrounding regions influenced by other existing and planned projects; and
- Broader geographic and temporal scales where unplanned but predictable impacts may emerge.

While compliance with IFC Performance Standards is not a requirement under South African EIA regulations, their guidance on addressing cumulative impacts is acknowledged. This includes analyzing the interaction of project impacts with other human activities and natural drivers affecting Valued Environmental and Social Components (VECs). During financial close and subsequent phases, the project will incorporate additional measures to align with international standards where necessary.

This cumulative impact assessment provides a foundation for understanding the broader environmental and social context of the Groothoek WEF. It evaluates the additive effects of the project in conjunction with other renewable energy developments within the region, with the goal of proposing actionable measures to mitigate cumulative impacts where feasible. These measures will be detailed in the Environmental and Social Management Plans (ESMPs) and broader Environmental and Social Management System (ESMS) as the project progresses.

Cumulative impacts with existing and planned facilities may occur during construction and operation of the Groothoek WEF. While one project may not have a significant negative impact on sensitive resources or receptors, the collective impact of the projects may increase the severity of the potential impacts.

Therefore, a number of projects within the surrounding area which have submitted applications for environmental authorisation (some of which have been approved) have been considered. The projects considered are from the latest REEA database from the DFFE (2024 Quarter 2). It is important to note that the existence of an approved EA does not directly equate to actual development of the project.

The proposed Groothoek WEF is not located within one of the promulgated Renewable Energy Development Zones (REDZ). The projects located within a 50km radius of the site that should be considered in the cumulative impact assessment is included in **Table 8-2**, and illustrated in **Figure 8-1**.

Due to the fact that there are no neighbouring authorised or operational WEFs within 20km of the Groothoek WEF, no wake loss effect study is deemed required. The wake loss effect that may be associated with the neighbouring Kromhof and Normandien WEFs will be taken into account by the developer during the design of the WEFs

Table 8-2 – Projects within 50km of the Groothoek WEF

Project Name	Applicant	Status	Reference Number	Distance away (KM)
Newcastle Gas Engine Power Plant (NGEPP), Newcastle, KwaZulu-Natal Province.	Newcastle Energy (Pty) Ltd	Refused	14/12/16/3/3/2/2074	36
Proposed Upgrade of Karbochem boilers and electricity project in Newcastle	Distributed Energy Generation (Pty) Ltd	In process	14/12/16/3/3/1/1164	37
Proposed Upgrade of Karbochem boilers and electricity project in Newcastle - Amendment	Distributed Energy Generation (Pty) Ltd	Approved	14/12/16/3/3/1/1164/AM1	37
Proposed Newcastle solar energy facility near Newcastle, KwaZulu-Natal Province	Building Energy (Pty) Ltd	Refused	14/12/16/3/3/1/1225	38
Proposed Newcastle WEF 2 and associated grid infrastructure near Newcastle, KwaZulu-Natal Province	Mulilo Newcastle Wind Power 2 (Pty) Ltd	Refused	14-12-16-3-3-2-2213	32
Proposed Mulilo Newcastle WEF and associated grid infrastructure near Newcastle, KwaZulu-Natal Province	Mulilo Newcastle Wind Power (Pty) Ltd	Approved	14-12-16-3-3-2-2457	35
Proposed Mulilo Newcastle WEF 2 and associated grid infrastructure near Newcastle, KwaZulu-Natal Province	Mulilo Newcastle Wind Power 2 (Pty) Ltd	Approved	14-12-16-3-3-2-2458	32

Table 8-3 - Projects outside 50km of the Groothoek WEF

Project Name	Applicant	Status	Reference Number	Distance away (KM)
Proposed Construction Of A Photovoltaic (Pv) Solar Energy Facility On Portion 1 Of Rietfontein 1387 Gs At Pepworth Near Ladysmith, Kwa-Zulu Natal Province	Protea Energy	Approved	12/12/20/2671	54
Proposed Waaihoek Wind energy facility, Utrecht	Megawatt one Photovoltaic (Pty) Ltd	In process	14/12/16/3/3/2/655	77
The 140MW Waaihoek wind energy facility, South-East of Utrecht within the Emadlangeni Local Municipality in the KZN Province	Waaihoek Wind Farm (Pty) Ltd	Approved	14/12/16/3/3/2/655/AM5	77
Waaihoek Wind Farm (Pty) Ltd, is proposing a deviation to the powerline route and associated infrastructure from the authorised 88kV powerline and the addition of an Eskom portion of the on-site substation for the Waaihoek Wind Energy Facility (WEF). Th*	Waaihoek Wind Farm (Pty) Ltd	Approved	14/12/16/3/3/1/2606	78
The proposed waaihoek battery energy storage system (BESS) and reservoir, associated with the authorised waaihoek wind energy facility and power line located near Utrecht, Emadlangeni Local Municipality, Amajuba District, KwaZulu-Natal	Caaihoek Wind Farm (Pty) Ltd	Approved	14/12/16/3/3/1/2266	79
Proposed Extension Of The Emondlo, St James And Leksand Substation Yards, Including The Reconstruction Of The Existing Leksand-St James 88/22kv Powerline And The Construction Of The New	Unknown	Approved	12/12/20/2475	88

Project Name	Applicant	Status	Reference Number	Distance away (KM)
Emondlo-St James 88/22kv Powerline, Kwazulu Natal				
Proposed Construction Of The 30mw Thukela Hydro Electric Power Schemes (Site 5) On The Thukela River, Kwazulu-Natal Province	Thukela Hydro Electric Power Schemes (Pty) Ltd	Approved	12/12/20/1998/2/AM1	135
Proposed Construction Of The 30mw Thukela Hydro Electric Power Schemes (Site 4) On The Thukela River, Kwazulu-Natal Province	Thukela Hydro Electric Power Schemes (Pty) Ltd	Approved	12/12/20/1998/1	142
Proposed Construction Of The 30mw Thukela Hydro Electric Power Schemes (Site 4) On The Thukela River, Kwazulu-Natal Province	Thukela Hydro Electric Power Schemes (Pty) Ltd	Approved	12/12/20/1998/1/AM1	142
Proposed Construction Of A Photovoltaic (Pv) Solar Energy Facility On Portion 1 Of Rietfontein 1387 Gs At Pepworth Near Ladysmith, Kwa-Zulu Natal Province	Unknown	Approved	12/12/20/2672	65
Proposed 65MW solar PV facility at Majuba Power Station in Mpumalanga Province	Eskom Holding SOC Limited	Approved	14//12/16/3/3/2/752	95

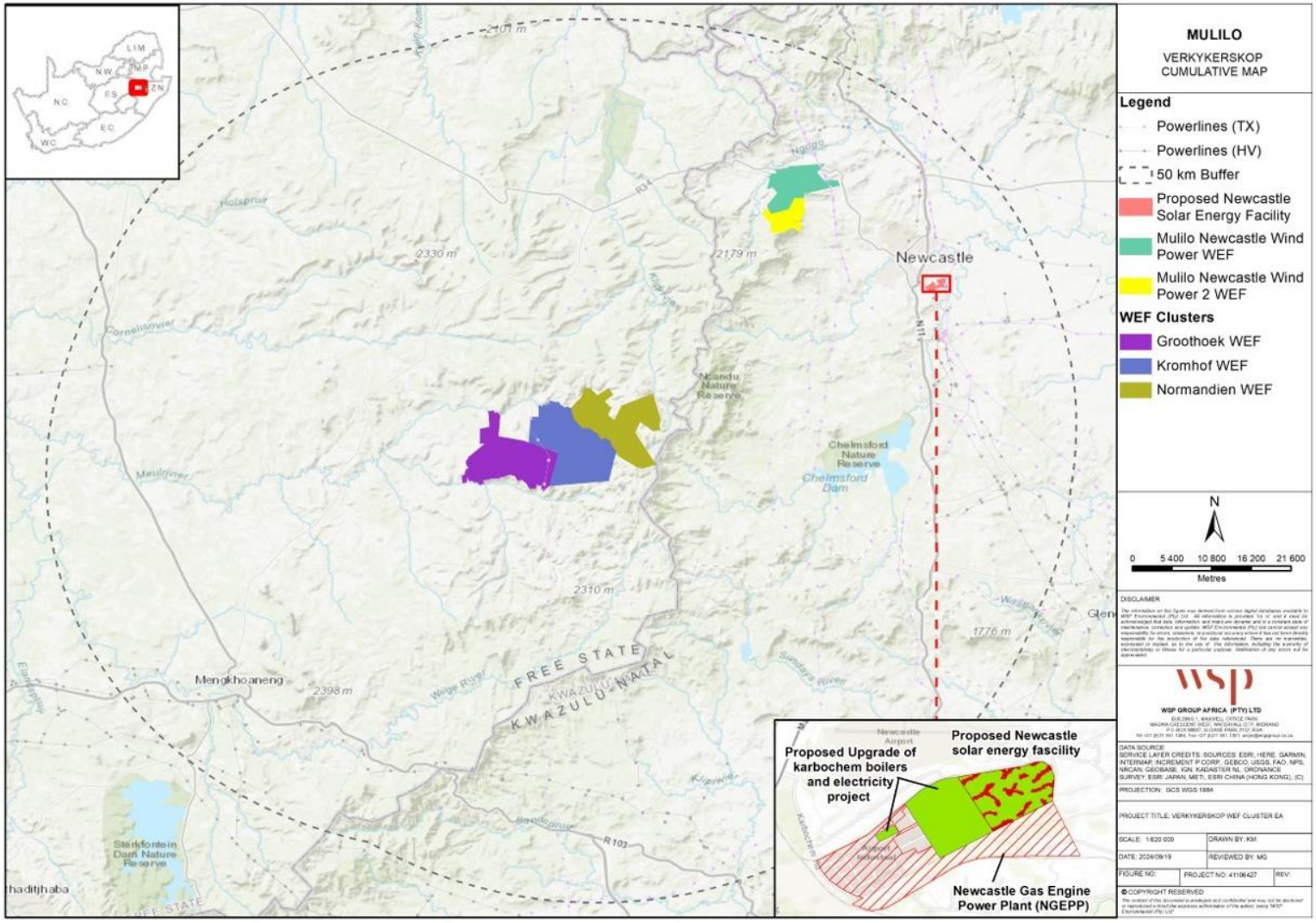

Figure 8-1 – Map showing projects within 50km of the Groothoek WEF

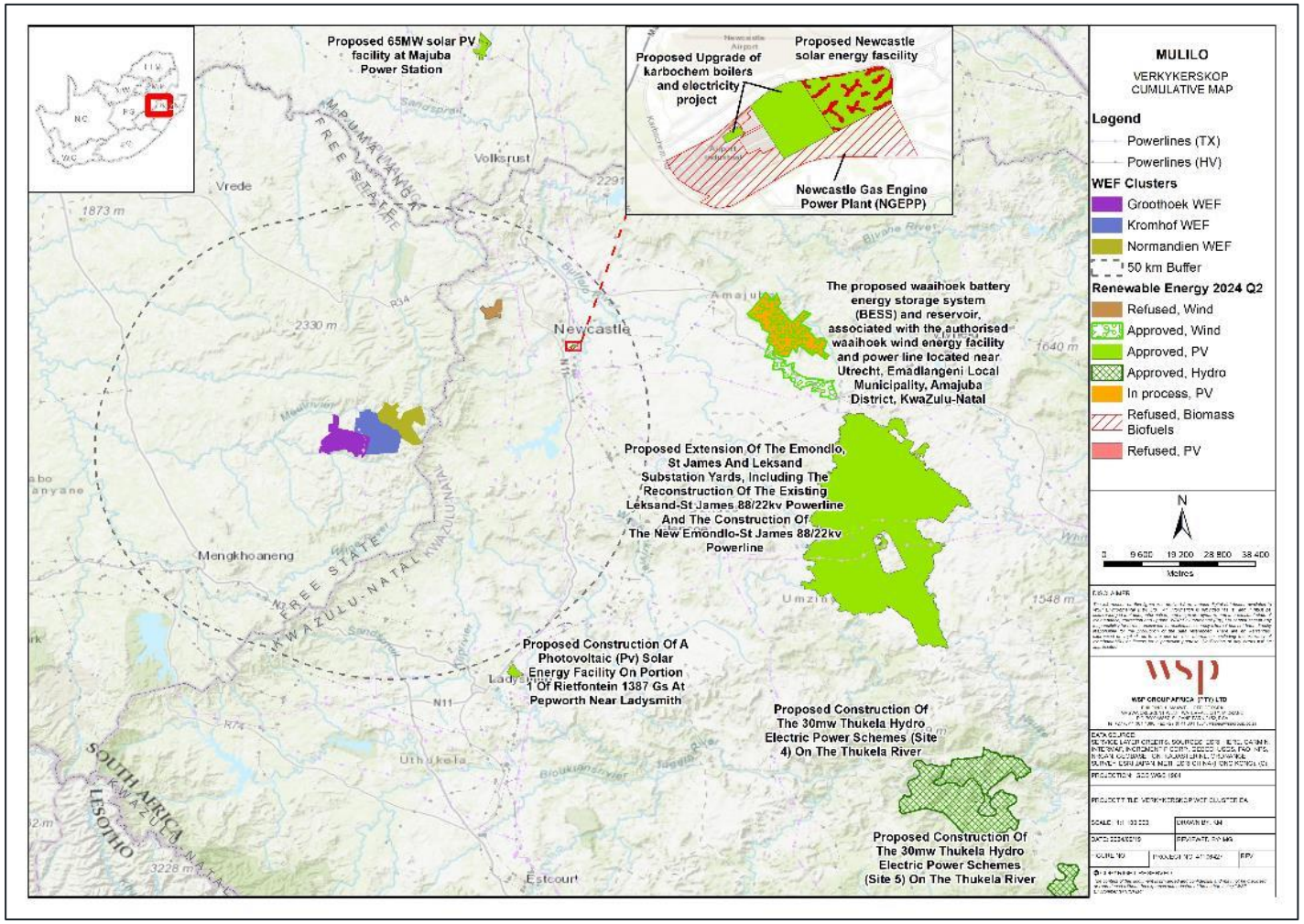

Figure 8-2 - Projects outside 50km of the Groothoek WEF

8.2.1 AGRICULTURE

Specialist assessments for environmental authorisation are required to include an assessment of cumulative impacts. The cumulative impact of a development is the impact that development will have when its impact is added to the incremental impacts of other past, present, or reasonably foreseeable future activities that will affect the same environment.

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable level of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of future agricultural production potential. The defining question for assessing the cumulative agricultural impact is this:

> *What loss of future agricultural production potential is acceptable in the area, and will the loss associated with the proposed development, when considered in the context of all past, present or reasonably foreseeable future impacts, cause that level in the area to be exceeded?*

The Department of Forestry, Fisheries and the Environment (DFFE) requires compliance with a specified methodology for the assessment of cumulative impacts. This is positive in that it ensures engagement with the important issue of cumulative impacts. However, the required compliance has some limitations and can, in the opinion of the author, result in an over-focus on methodological compliance, while missing the more important task of effectively answering the above defining question.

This cumulative impact assessment determines the quantitative loss of agricultural land if all renewable energy project applications within a 50 km radius become operational. These projects are listed in Appendix 4 of this report. Note that electrical grid infrastructure projects do not contribute to a loss of agricultural land and are not therefore included in this calculation of cumulative land loss. The area of land taken out of agricultural use as a result of all the projects listed in Appendix 4 of the study (total generation capacity of 1175 MW) will amount to a total of approximately 518 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30 km radius (approximately 282,700 ha), this amounts to only 0.18% of the surface area. This is well within an acceptable limit in terms of loss of low potential agricultural land, which is only suitable for grazing, and of which there is no scarcity in the country.

8.2.2 TERRESTRIAL BIODIVERSITY

The loss of on-site habitat associated with the proposed Project, coupled with ongoing land uses changes across the broader landscape that result in habitat loss and disturbance, may have cumulative negative impacts on local terrestrial biodiversity and broader ecological functioning that are greater in extent than that of any one project. It is therefore important that measures are put in

place to minimise any potential cumulative impacts on terrestrial biodiversity as well as plant and animal species.

8.2.3 AVIFAUNA

The AOI is largely natural and, in most areas, pristine. There are no operational wind energy facilities in or within 50 km surrounding the project area.. Including this project, there are at least 4 prospective wind developments planned for the Phumelela region. There is, however, also a vested birding interest in the region (e.g. Roberts Memel Birding Site, Memel Getaway Birding Routes) and NGOs such as BirdLife and EWT are distinctly aware of the avifaunal importance and are actively working in the region. The proposed VWC is not located within one of the promulgated Renewable Energy Development Zones (REDZ) and a portion of the northern end of the VWC overlaps the Grasslands IBA..

Based on the information, the cumulative impact of wind energy developments in this region is likely to have a significant consequence for birdlife on a national to global scale, and therefore, the cumulative avifauna impact is considered to be Very High.

8.2.4 BATS

Of some additional concern is the potential cumulative impact on bats from increasing anthropogenic activities in the region including commercial crop cultivation (involving e.g., pesticide spraying), burning, urban settlement (involving e.g., persecution of bats in rooves and light pollution), and energy development. According to the Department of Forestry, Fisheries, and the Environment's Renewable Energy EIA Applications Database (https://egis.environment.gov.za/data_egis - consulted in September 2024), there is within 50 km of the proposed Verkykerskop WEF cluster site at least one proposed WEF, viz. the Newcastle Wind Power 2 project ca. 32 km north-east. A proposed biofuel plant near Newcastle has apparently been refused. Within 100 km of the proposed Verkykerskop WEF cluster site there are at least two approved solar photo-voltaic projects (near Ladysmith and Majuba) and at least one proposed WEF, viz. the Waaihoek WEF ca. 77 km east- north-east, near Utrecht. . Additional wind farms may be planned in the region, which are not shown. Of chief concern is that, without considerable mitigation (primarily, pre-construction avoidance of High sensitive areas, and secondarily, operational management of bat fatalities below the Groothoek WEF fatality threshold), the proposed Groothoek WEF could have an appreciable adverse impact on certain bat populations that are meant to be conserved by the various protected areas in the surrounding region.

8.2.5 TRAFFIC

Cumulative impacts with existing and planned facilities may occur during construction and operation of the proposed Groothoek WEF. While one project may not have a significant negative impact on sensitive resources or receptors, the collective impact of the projects may increase the severity of the potential impacts.

A number of projects within a 50km radius which have submitted applications for environmental authorisation (some of which have been approved) have been considered. The projects considered are from the latest REEA database from the DFFE (2023 Quarter 3). It is important to note that the existence of an approved EA does not directly equate to actual development of the project.

The proposed Groothoek WEF is not located within one of the promulgated Renewable Energy Development Zones (REDZ). To assess a cumulative impact, it is generally assumed that all

currently approved and authorized projects within a 30 km radius would be constructed at the same time.

The construction phase of a renewable energy project is the highest traffic generator. The duration of this phases is short term, i.e., the potential impact of the traffic generated during the construction phase on the surrounding road network is temporary and wind energy projects, when operational, do not add any significant traffic to the road network.

8.2.6 HERITAGE RESOURCES

Renewable energy projects within a 50km radius will have an added cumulative impact on heritage resources and the cultural landscape. The cumulative impacts of the proposed Project to heritage resources can be mitigated to an acceptable level with the adherence of correct mitigation measures as included in this report and will be in the Heritage Impact Assessment (HIA) for the Project. With adherence to the recommendations the proposed Project is expected to have a low cumulative impact.

8.2.7 ACOUSTIC

Cumulative impacts with existing and planned facilities may occur during construction and operation of the proposed Groothoek WEF. While one project may not have a significant negative impact on sensitive receptors, the collective impact of the projects may increase the severity of the potential impacts.

The only other project within the vicinity of the Groothoek WEF site, is the neighbouring proposed Kromhof WEF, located immediately east. With no common shared receptors between the two sites, cumulative impacts are not anticipated.

8.2.8 SOCIAL

Cumulative impacts with existing and planned facilities may occur during construction and operation of the proposed Verkykerskop WEF Cluster. While one project may not have a significant negative impact on sensitive resources or receptors, the collective impact of the projects may increase the severity of the potential impacts.

Therefore, a number of projects within the surrounding area which have submitted applications for environmental authorisation (some of which have been approved) have been considered. The projects considered are from the latest REEA database from the DFFE (2023 Quarter 3). It is important to note that the existence of an approved EA does not directly equate to actual development of the project.

The proposed Verkykerskop WEF Cluster is not located within one of the promulgated Renewable Energy Development Zones (REDZ).

Sense of Place

The potential cumulative impacts on the area's sense of place will be linked mainly to potential visual impacts. These issues relate to wind energy facilities and their associated infrastructure. The relevant issues identified include:

- Combined visibility (whether two or more wind farms will be visible from one location).
- Sequential visibility (e.g. the effect of seeing two or more wind farms along a single journey, e.g.
- road or walking trail)

The visual compatibility of different energy facilities in the same vicinity. Perceived or actual change in land use across a character type or region. Loss of a characteristic element (e.g. viewing type or feature) across a character type caused by developments across that character type.

Cumulative impacts need to be considered from dynamic and static viewpoints. For example, the experience of driving along a tourist road is regarded as a dynamic sequence of views and visual impacts, not just as the cumulative impact of several developments on one location. The viewer may only see one renewable energy facility and the associated infrastructure at a time. Still, each successive views of renewable energy facilities, can be argued to have a cumulative visual impact (Environmental Protection and Heritage Council, 2010).

Approximately 4 renewable energy projects are located within a 50 km range of the project site.

There is, therefore, the possibility of combined and sequential impacts. However, given the site's location, the potential impact of the proposed energy-generating facilities and associated infrastructure on the area's sense of place is likely to be limited. The significance of this impact is rated Negative-Medium.

Local Services And Accommodation

The development of multiple renewable energy projects has the potential to put a strain on local services and accommodations, particularly during the construction phase. The goal will be to source as many un-skilled and semi-skilled employees from the local municipality as possible during the construction and operational phases of the Project. Sourcing skills locally will relieve the strain on local services, accommodations, and the nearby town of Harry Smith. However, considering the construction phase's brief duration, the potential impact is expected to be limited.

The potential impact should also be considered in light of the possible beneficial cumulative effects on the local economy linked with the planned facilities and accompanying renewable energy projects in the local municipality. Such benefits will generate opportunities for investment in the municipality such as upgrading and expanding existing services and building new residences. The significance of this impact is rated Negative-Low.

Local Economy

In addition to the potential negative impacts, establishing renewable energy facilities and associated infrastructure will create several socio-economic opportunities for the Msukaligwa local municipality. The positive cumulative economic opportunities include the creation of employment, skills development and training opportunities, and downstream business opportunities.

The potential cumulative benefits for the local and regional economy are associated with the construction and operational phases of renewable energy projects and related infrastructure, extending over 20-25 years. However, steps must be taken to maximise employment opportunities for local community members and support skills development and training programmes. This impact's significance is positive and rated Medium.

The cumulative impacts are identified as a sense of place resulting from the visual change of scenic views because of several solar PV and wind energy facilities within the viewer's sight. Due to limited resources, local services and accommodation could negatively affect the local municipality service delivery. Socio-economic opportunities may rise due to increased renewable energy facilities within the municipality.

8.2.9 TRAFFIC

To assess a cumulative impact, it is generally assumed that all wind farms within a 50 km radius, currently proposed and authorized, would be constructed at the same time. This is the precautionary approach as in reality; these projects would be subject to a highly competitive bidding process and not all the projects may be selected to enter into a Power Purchase Agreement. Even if all the facilities are constructed and/or decommissioned at the same time, the roads authority will consider all applications for abnormal loads and work with all project companies to ensure that loads on the public roads are staggered and staged to ensure that the impact will be acceptable.

The construction and decommissioning phases of a WEF are the only significant traffic generators. The duration of these phases is short term, i.e., the potential impact of the traffic generated during the construction and decommissioning phases on the surrounding road network is temporary and WEFs, when operational, do not add any significant traffic to the road network.

8.2.10 VISUAL

The region is predominantly a rural and agricultural landscape, although Newcastle, Harrismith and several other small towns occur within the cumulative impact assessment study area. Currently, the cumulative impact assessment study area is essentially devoid of projects similar in appearance to the proposed Groothoek WEF, noting that two further wind turbine and one electric boiler projects approved within this area are expected to cause similar impacts to that of the Groothoek project.

The visual impact associated with the proposed Groothoek WEF project will entail the introduction of highly visible renewable energy generation infrastructure into the visual landscape, thereby transforming a notable additional section of the mostly rural, agricultural study area towards energy generation. The cumulative effect together with that of the various other proposed renewable projects if developed, will partially alter the existing rural character of the study area, which may act as catalyst for further similar development in the vicinity.

The cumulative visual impact of the project is expected to be on the lower end of moderate and will be confirmed once the detailed impact assessment has been completed.

8.3 SUMMARY OF IMPACT SIGNIFICANCE SCREENING

This section presents a summary outlining the likely significance of potential impacts identified for the construction phase (**Table 8-4**), operational phase (**Table 8-5**), decommissioning phase (

Table 8-6) and potential cumulative impacts (**Table 8-7**). The impact screening tool is based on two criteria, namely probability and consequence (outlined in Section 2.5). This is used as a guide to determine whether additional assessment may be required in the EIA phase. Impacts will be refined and assessed during the EIA phase.

Table 8-4 - Significance of potential construction phase impacts

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Soil, Landuse and Land Capability	Soil and land capability	Negative	2	2	**Low**
Plant Species	Direct Loss of natural habitat and associated flora SCC	Negative	3	4	**High**
	Disturbance of natural habitat and associated flora SCC	Negative	3	2	**Medium**
	Establishment and spread of AIS	Negative	3	2	**Medium**
Animal Species	Disturbance and fragmentation of faunal habitat	Negative	3	2	**Medium**
Aquatic Biodiversity	Water quality deterioration	Negative	4	3	**High**
	Increased sediment load	Negative	4	3	**High**
	Establishment and spread of AIS	Negative	3	2	**Medium**
Wetlands	Direct Loss of wetland habitat	Negative	4	4	**High**
	Soil Erosion	Negative	3	3	**Medium**
	Establishment and spread of AIS	Negative	3	3	**Medium**
	Changes in wetland health/functioning	Negative	3	3	**Medium**

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
	Contamination of riparian habitat systems	Negative	4	3	High
Avifauna	Loss or Alteration of Habitat	Negative	4	3	High
	Roadkill and other mortalities	Negative	2	2	Low
	Sensory disturbance during construction	Negative	2	2	Low
Bats	Roost disturbance or destruction.	Negative	3	3	High
	Foraging habitat	Negative	3	3	High
	Decline or loss of bat ecosystem services.	Negative	3	3	High
Noise/ Acoustic	Acoustic impacts on surrounding sensitive receptors	Negative	3	1	Low
Archaeology	Impacts of the proposed development to archaeological resources	Negative	2	2	Medium
Traffic	Temporary increase in traffic	Negative	2	2	Low
	Dust and Noise pollution	Negative	2	2	Low
Visual	Airborne Dust	Negative	3	2	Medium
	Presence of visually intrusive components	Negative	3	2	Medium
Social	Job Creation	Positive	4	4	Very High
	The influx of Job Seekers	Negative	3	2	Medium

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
	Procurement from Local Businesses	Positive	3	2	Medium
	Loss of Farmlands	Negative	2	2	Low
	Income for Affected Landowners	Positive	3	2	Medium
	Community Health, Safety, and Security	Negative	2	2	Low
	Environmental Health	Negative	2	2	Low
Geotechnical	Soil Erosion	Negative	2	2	Low
	Disturbance of Fauna and Flora	Negative	3	2	Medium
	Oil Spillages from Heavy Plant	Negative	2	3	Medium
	Slope Stability	Negative	2	2	Low
	Seismic Activity	Negative	1	1	Very Low
	Groundwater	Negative	2	1	Low

Table 8-5 - Significance of potential operational phase impacts

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Avifauna	Collisions with turbines	Negative	4	4	Very High
	Collisions and Electrocutions with Electrical Transmission Lines and Auxiliary Infrastructure	Negative	3	3	Medium
	Sensory Disturbance	Negative	3	4	High
	Effect on migratory and congregatory species	Negative	3	3	High

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Animal Species	Fragmentation of habitats, barriers to movements.	Negative	3	2	**Medium**
	Injury and mortality of fauna SCC	Negative	3	2	**Medium**
Plant Species	Spread of AIS	Negative	3	2	**Medium**
Aquatic Biodiversity	Water quality deterioration	Negative	3	2	**Medium**
	Increased sediment load	Negative	3	2	**Medium**
	Establishment and spread of AIS	Negative	3	2	**Medium**
Bats	Bat Fatalities	Negative	3	3	**High**
Wetlands	Erosion	Negative	2	3	**Medium**
	Establishment and spread of AIS	Negative	3	2	**Medium**
	Contamination of riparian habitat systems	Negative	3	2	**Medium**
Transport		Negative	1	1	**Very Low**
Noise/ Acoustic	Acoustic impacts on surrounding sensitive receptors	Negative	3	2	**Medium**
Visual	Presence of turbines, other infrastructure	Negative	3	4	**High**
	Glare, flicker	Negative	3	4	**High**
	Light pollution	Negative	3	4	**High**
Social	Job Creation	Positive	3	4	**High**
	An influx of Job Seekers	Negative	3	2	**Medium**
	Procurement from Local Businesses	Positive	3	2	**Medium**
	Community Health, Safety and Security	Negative	2	2	**Low**
	Environmental Health	Negative	2	2	**Low**
	Energy Generation	Positive	3	4	**High**

Table 8-6 – Significance of potential decommissioning phase impacts

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Traffic	Temporary increase in traffic	Negative	2	2	**Low**
	Dust and Noise pollution	Negative	2	2	**Low**
Noise/ Acoustic	Acoustic impacts on surrounding sensitive receptors	Negative	3	1	**Low**
Social	Loss of Employment	Negative	3	2	**Medium**
	Loss of Livelihoods	Negative	3	4	**High**
Geotechnical	Soil erosion	Negative	2	2	**Low**
	Disturbance of Fauna and Flora	Negative	3	2	**Medium**
	Oil Spillages from Heavy Plant	Negative	2	2	**Low**
	Seismic Activity	Negative	1	1	**Low**

Table 8-7 - Significance of potential Cumulative Impacts

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Traffic	Temporary increase in traffic	Negative	3	2	**Medium**
	Dust and Noise pollution	Negative	2	2	**Low**
Social	Sense of Place	Negative	3	2	**Medium**
	Loss of Employment	Negative	3	2	**Low**
	Loss of Livelihoods	Positive	3	4	**Medium**
Geotechnical	Soil erosion	Negative	3	2	**Medium**
	Potential Oil Spillages	Negative	3	2	**Medium**
	Disturbance of fauna and flora	Negative	2	1	**Low**
	Slope stability	Negative	2	1	**Low**

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
	Seismic activity	Negative	1	1	**Very Low**
Visual	Alteration of the existing rural character	Negative	3	2	**Medium**
Avifauna	Cumulative Avifaunal Impacts	Negative	4	4	**Very High**
Terrestrial Biodiversity (Including Plants and Animal species)	Cumulative Biodiversity Impacts	Negative	4	3	**High**

9 PLAN OF STUDY FOR THE EIA

9.1 PLAN OF STUDY FOR EIA TERMS OF REFERENCE

Table 9-1 outlines the structure of the plan of study as required in terms of Appendix 2 of GNR 982.

Table 9-1 - Plan of Study Requirements

Plan of Study Chapter	Information Requirements as per GNR 982
Description of EIA Tasks	▪ A description of the tasks that will be undertaken as part of the environmental impact assessment process.
Description of Alternatives	▪ A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.
Aspects to be Assessed in the EIA Process	▪ A description of the aspects to be assessed as part of the environmental impact assessment report process.
Specialist Studies	▪ Aspects to be assessed by specialists.
Impact Assessment Methodology	▪ A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists. ▪ A description of the proposed method of assessing duration and significance.
Environmental Impact Report	▪ Contents of EIAR as specified in GNR 982 (as amended) Annexure 2
Stakeholder and Authority Engagement	▪ An indication of the stages at which the competent authority will be consulted. ▪ Particulars of the public participation process that will be conducted during the environmental impact assessment process.

9.2 OVERVIEW OF THE EIA PHASE TASKS

The EIA phase will consist of the following tasks; each of these tasks is detailed separately in the following sub-sections:

- Specialist studies;
- Continuation of authority and stakeholder engagement;
- Assessment of the significance of potential impacts; and
- Preparation of the EIA Report.

9.3 DESCRIPTION OF ALTERNATIVES

The EIA process identifies two types of project alternatives:

- Concept Level Alternatives, which relate to the site, technology and process alternatives
- Detailed Level Alternatives which relate to mitigation measures

The feasibility of the higher-level Concept Alternatives have been discussed within Section 4 of this report. The Detailed Level Alternatives which relate to mitigation measures, will be addressed within the EIA Report.

Table 9-2 outlines the alternatives considered feasible from an environmental perspective to be assessed in the EIA Phase.

Table 9-2 –Alternatives to be Assessed in the EIA Phase

Alternative		Comment
Site	Groothoek WEF (Preferred Alternative):	There is no site alternative for the Groothoek WEF. The location of the project infrastructure was subjected to a site selection process as described in **Section 4.2**.
Technology	Wind Technology (Preferred Alternative)	Wind technology has been identified as the preferred activity in terms of generating electricity from a renewable resource.
	Solid State Lithium (SSL) Battery Technologies (Preferred Alternative)	Pre-assembled solid state battery technologies are preferred
Layout and Design	• Preliminary Layout (up to 55 Turbines) (Eliminated) (**Figure 4-1**) • Optimised Layout (up to 31 Turbines) (**Figure 9-1**) • The avifaunal sensitivity map overlain by the Optimised Layout is illustrated in **Figure 9-2**.	The Groothoek WEF turbine layout, was revised during the Scoping Phase, from the initial 55 turbines to 31 turbines. The turbine layout was revised in order to avoid sensitive features and buffer areas. The two turbines located within the 'no-go zone' have been acknowledged and are indicated in red on the avifauna sensitivity map (**Figure 9-2**). These turbines will be relocated accordingly in the revised layout. The revised layout will be assessed by the specialists during the EIA Phase. Further recommendations received from the specialists as a result of their detailed studies will be utilised to further optimise the layout such that the EIA Phase results in a preferred final layout for approval.

In the "no project" alternative, the proposed project will not be developed. In this scenario, there could be a missed opportunity to address the need for increase in renewable energy generation in an effort to mitigate against concerns of climate change and exploitation of non-renewable resources. The no-go alternative would not assist in responding to the growing electricity demand in South Africa and would not contribute to the reliability of electricity supply at a national scale. Conversely, negative environmental impacts of the project associated with the development of the Groothoek WEF would be avoided, and the current status quo will continue. This includes continued use of the land for agriculture.

Areas of sensitivity flagged through the scoping reports will be subject to disturbance through agricultural development, and other disturbance factors. As the development of Wind projects, provides the opportunity to provide on-going protection and rehabilitation for sensitive areas within the project area.

No-Go Alternative will also not provide the type of temporary and permanent socio-economic benefits that a wind development entails, resulting in a loss of opportunities for jobs and social upliftment for the communities.

The “no project” alternative will be considered in the EIA phase as a baseline against which the impacts of the proposed project will be assessed. The no-go alternative will be discussed in more detailed during the EIA Phase.

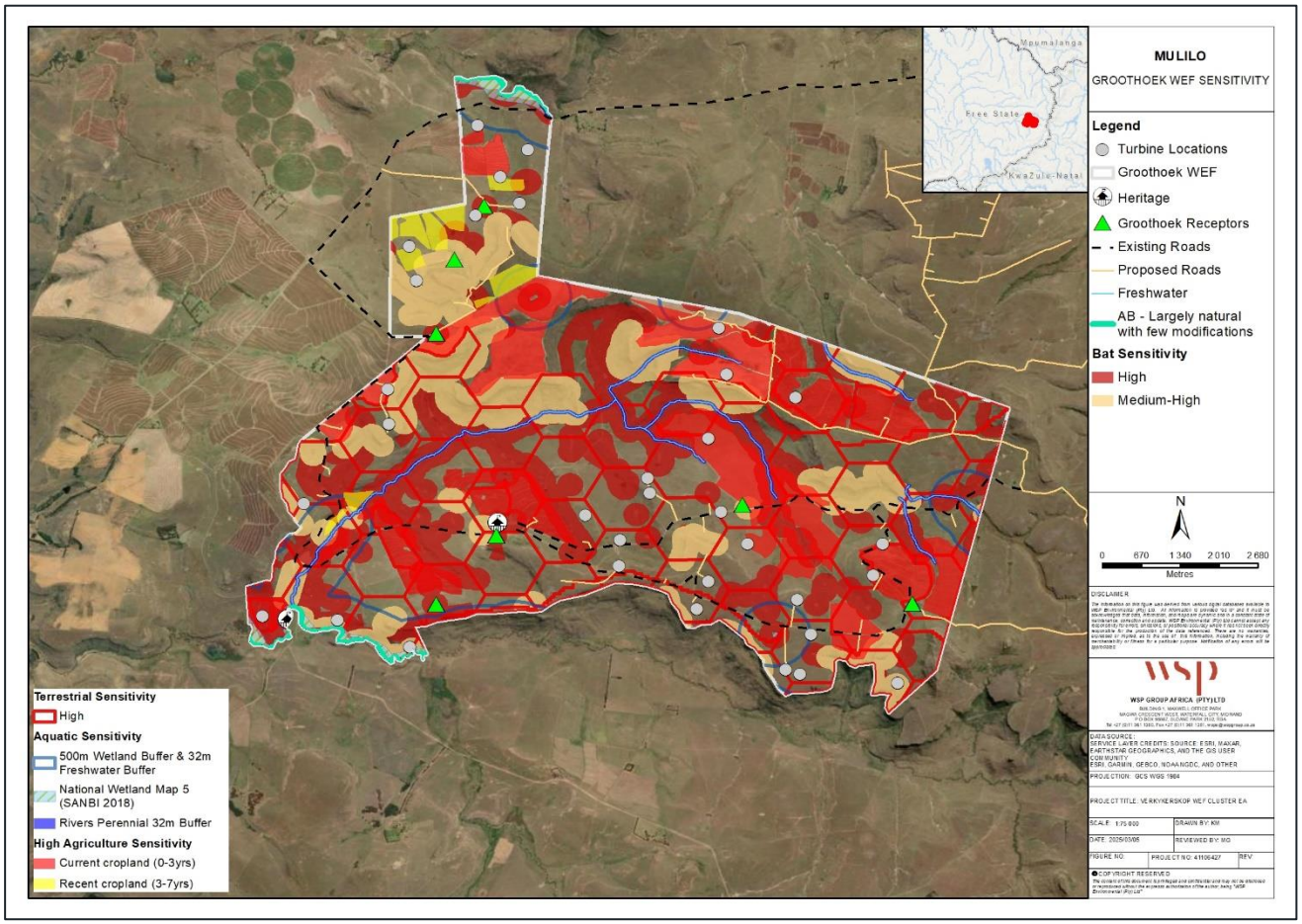

Figure 9-1 – Groothoek WEF - Consolidated Sensitivity Map overlain by Optimised Project Layout (excluding Avifauna)

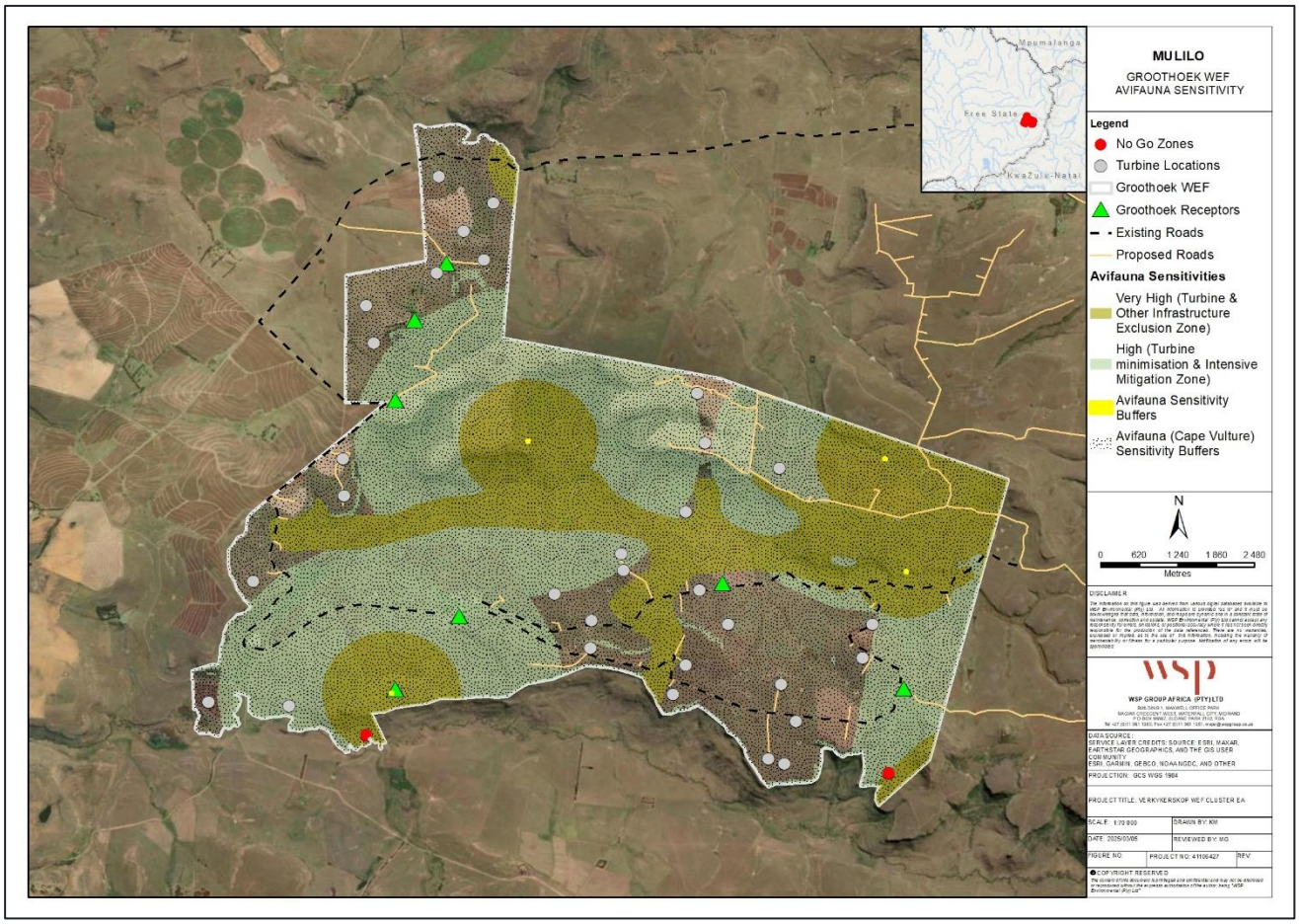

Figure 9-2 – Groothoek WEF - Avifauna Sensitivity Map overlain by the Optimised Layout

9.4 ASPECTS TO BE ASSESSED IN THE EIA PROCESS

Table 9-3 outlines the key aspects that were identified in the scoping phase; these aspects will be subject to further assessment in the EIA Phase.

Table 9-3 – Summary of aspects to be addressed in the EIA Phase

Environmental Aspect	Impact
Soil, Land use and Land Capability Assessment	• Soil and land capability • Soil Contamination • Soil Compaction • Loss of agricultural potential
Terrestrial Biodiversity	• Floral Habitat and Diversity • Floral SCC
Plant Species	• Direct loss and disturbance of natural habitat and associated species of conservation of concern (SCC) • Establishment and spread of alien and invasive species. • Spread of alien invasive species

Environmental Aspect	Impact
Animal Species	• Injury and mortality of faunal species of conservation concern • Disturbance and fragmentation of faunal habitat • Injury and mortality of faunal species
Aquatic Biodiversity	• Water Quality deterioration • Increase in sediment load due to earth works and subsequent loss of habitat. • Establishment and spread of alien and invasive species. • Loss of wetland habitat • Changes in wetland health/ functioning • Contamination of riparian systems • Soil erosion • Water quality deterioration and contamination of wetland soils
Avifauna	• Loss or Alteration of Habitat • Roadkill and other mortalities • Sensory disturbance during construction • Collisions with turbines • Collisions and Electrocutions with Electrical Transmission Lines and Auxiliary Infrastructure • Sensory Disturbance • Effect on migratory and congregatory species
Bats	• Roost disturbance or destruction. • Forging habitat • Bat Fatalities • Decline or loss of bat ecosystem services.
Heritage And Archaeology	• Loss of heritage and archaeological resources
Palaeontology	• Loss of palaeontological resources
Traffic	• Temporary increase in traffic • Dust and Noise pollution • Increase in traffic
Visual	• Construction activities • Airborne dust • Presence of turbines, other infrastructure • Glare Flicker • Light pollution
Social	• Job Creation • The Influx of Job Seekers • Procurement from local businesses for supplies and services. • Loss of agricultural land • Generate income for affected landowners

Environmental Aspect	Impact
	• Community Health, Safety and Security • Intrusion impact • Energy Generation • Loss of employment • Loss of Livelihood
Detailed Geotechnical Desktop Assessment	• Soil Erosion • Disturbance of fauna and flora • Oil spillages from heavy plant • Seismic activity • Groundwater: • Slope instability around structures
Acoustic	• Noise disturbance

9.5 SPECIALIST STUDIES TO BE UNDERTAKEN

The following specialist assessments have been commissioned for the EIA Phase:

- Soil, Land use and Land Capability Assessment;
- Terrestrial Ecological Assessment (including Plant and Animal Species Assessments);
- Aquatic Biodiversity Assessment;
- Avifauna Impact Assessment;
- Bat Impact Assessment;
- Visual Impact Assessment;
- Archaeology and Cultural Heritage Assessment;
- Palaeontological Assessment;
- Social Impact Assessment;
- Detailed Geotechnical Desktop Assessment;
- Traffic and Transport Assessment.

It should be noted that the specialist studies will be undertaken according to the procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of Sections 24(5)(a) and (h) and Section 44 of the NEMA (GNR 320, dated 20 March 2020), where applicable.

9.5.1 SOIL, LAND USE AND LAND CAPABILITY ASSESSMENT

The level of soil assessment undertaken during the current scoping phase is considered entirely adequate for an understanding of on-site soil potential for the purposes of a wind farm assessment. For this purpose, only an understanding of the general range and distribution patterns of different soil conditions across the site is required. A more detailed soil survey would be extremely time consuming and impractical to conduct, given the very large assessment area, and would not provide any additional data that would add value to the assessment of the agricultural impact of the wind farm.

This is because a wind farm extends over a very large surface area. The layout design of a wind farm is complex and there are multiple interacting factors that determine the turbine locations that

will ensure the viability of the wind farm. Each turbine influences the amount of wind that the other turbines receive. Therefore, the location of one turbine cannot simply be shifted without requiring other turbines to be shifted as well, to retain the viability of all the turbines. To shift turbines to account for variation in soil conditions would be extremely complex and would require a level of soil mapping detail across the whole wind farm area that would be practically impossible to achieve. Even with this level of detail, it is highly unlikely that it would have any influence on agricultural impact.

An assessment of soils and long-term agricultural potential is in no way affected by the season in which the assessment is made, and therefore the date on which this assessment was done has no bearing on its results.

- Micro-siting

  The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. An aspect of wind farm layout that can cause unnecessary fragmentation of croplands is the location of turbine access roads within croplands. This will be assessed in the EIA phase.

- Confirmation of linear activity exclusion
  - If linear infrastructure has been given exclusion from complying with certain requirements of the agricultural protocol because of its linear nature, the protocol requires confirmation that the land impacted by that linear infrastructure can be returned to the current state within two years of completion of the construction phase. No such exclusion applies to this project.
- Compliance with the allowable development limits
  - The agricultural protocol stipulates allowable development limits for renewable energy developments of > 20 MW. Allowable development limits refer to the area of a particular agricultural sensitivity category that can be directly impacted (i.e. taken up by the physical footprint) by a renewable energy development. The agricultural footprint is defined in the protocol as the area that is directly occupied by all infrastructures, including roads, hard standing areas, buildings, substations etc., that are associated with the renewable energy facility during its operational phase, and that result in the exclusion of that land from potential cultivation or grazing. It excludes all areas that were already occupied by roads and other infrastructure prior to the establishment of the energy facility but includes the surface area required for expanding existing infrastructure (e.g. widening existing roads). It excludes the corridor underneath overhead power lines but includes the pylon footprints. It therefore represents the total land that is actually excluded from agricultural use as a result of the renewable energy facility (the agricultural footprint).
  - The allowable development limit on land of low and medium agricultural sensitivity with a land capability of < 8, as this site has been verified to be, is 2.5 ha per MW. This would allow the proposed facility of MW to occupy an agricultural footprint of 300 x 2.5 = 750 hectares. The wind facility being assessed will occupy an agricultural footprint of 150 hectares. It is therefore confirmed that the agricultural footprint of this development will be well within the allowable limit. It will in fact be approximately eight times smaller than what the development limits allow.

9.5.2 HERITAGE IMPACT ASSESSMENT

The area has historically been occupied and although the cultural landscape attests to more recent occupation, heritage resources such as structures (including farmsteads/ruins and associated burial

sites) and associated landscape elements older than 60 years are of importance and are protected by Section 34 & 36 of the NHRA. Iron Age stone walled settlements also occur in the larger area relating to Batlokwa and Basia occupation and is protected by Section 35 of the NHRA.

To comply with the NHRA and with cognisance of known heritage resources in the area, it is recommended that the final footprint should be subjected to a HIA. During this study, the potential impact on heritage resources will be determined as well as levels of significance of recorded heritage resources. The HIA should also provide management and mitigation measures, ensuring that all the requirements of the SAHRA are met. To compile an integrated HIA, the following requirements apply:

- The study area is of low, moderate, and very high paleontological sensitivity and additional studies are required for the EIA phase;
- The visual impact of the WEF on the farmsteads that is older than 60 years and archaeological sites should be assessed by the Visual Specialist considering the sense of place and impact on the cultural landscape;
- During the public participation and stakeholder consultation process facilitated by the EAP, advertisements & site notices must reference the NHRA and address heritage concerns from stakeholders.

9.5.3 AVIFAUNA IMPACT ASSESSMENT

Based on the information provided, the developer will seek to establish up to four wind energy facilities within the VWC, of which Groothoek WEF is one. Each will have its own grid connection linear infrastructure. As the position and length of each grid connection corridor are currently unknown, this project allows for two 15-km alternatives for the Groothoek WEF.

9.5.3.1 Compliance

The approach outlined below has been designed to comply with the following global and national legislation and best proactive standards:

- International Finance Corporation (IFC) Performance Standard 6 (IFC, 2019);
- Equator Principles (EP4, 2020);
- Birds and wind energy best practice guidelines (Jenkins et al. 2015);
- Cape Vulture and wind farms best practice guidelines (BLSA, 2018);
- Verreaux's Eagle and wind farms best practice guidelines (BLSA, 2017);
- The National Web-Based Environmental Screening Tool DEA website (2022);
- South African National Biodiversity Institute (SANBI). 2020. Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Fauna Protocols for environmental impact assessments in South Africa;
- Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998 when applying for Environmental Authorisation (Gazetted October 2020).
- 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 20MW or more (Government Gazette No. 43110 – 20 March 2020).

9.5.3.2 Schedule and Deliverables

Scoping fieldwork involved an eight-day reconnaissance survey from 18-25 July 2022 (two days per WEF). Due to the scale of the project, there are six surveys in a year as opposed to the conventional four. Each survey for the VWC is run over two 22-day periods (which translates to ca. 5-6 days for Groothoek WEF per survey). Based on the two-year monitoring requirement, fieldwork sessions were thus planned to end in late2024, assuming no unforeseen catastrophic events or pandemic restrictions. The scoping reports are set to be submitted in January 2025. Then, allowing for data processing and reporting, the first draft submission deadline for all four WEF reports (one for each WEF) would be April 2025 (with progress reports after each sampling season). The following plan and scope of work is anticipated.

1. Information requests session (bullet point list and one remote meeting, completed).
2. Scoping Assessment (desktop study followed by 8-day site visit divided into 2 days per WEF project and a brief report (completed).
3. Use results of scoping assessment to inform initial layout planning of WEF and establish more precise scope of avifauna monitoring (completed).
4. Species specific guidelines are warranted, therefore:
   - Two-year cycle
   - Intensive pre-construction monitoring conducted according to national and international best practice as well as the species-specific guidelines for Verreauxs' Eagle, Cape Vulture

- Fieldwork per annual cycle:
  - Three in-field observers per site visit, which includes one avifaunal lead and two competent avifaunal field assistants;
  - This is broken into Six, 22-day field sessions (one in each main season and others in peak breeding season). This equates to six, 5-6 day trips per WEF project per year.
- Note the sessions are broken into two WEFs at a time (two site visit legs per survey). This essentially means 12 trips to and from our base in northern Gauteng per year so 12 surveys or 24 trips over the 2-year cycle;
  - A total of 17 Vantage Points and one Control for the VWC. Average of four vantage points per WEF;
  - 12 hours of surveying per vantage point per season totalling 72 hours per VP per year conducted by two observers simultaneously;
  - Two to four driven transects per WEF (including one control) conducted by the third observer in rotation with the vantage point observers;
  - One walked transect at each VP (including one control);
  - Several focal point surveys scattered throughout the VWC and AOI;
  - Progress report after each fieldwork session (6 per year)
  - Four pre-construction monitoring reports (one for each WEF) after 24-month cycle completed
  - Three Avifaunal Impact Assessment Reports (one for each WEFs grid connection infrastructure) submitted after the two-year monitoring WE reports have been completed.

- Mulilo will be initiating a carcass management project within the project area in collaboration with the local landowners and their staff. The Biodiversity Company was commissioned to extend the avifaunal monitoring by two surveys to note any changes in vulture attendance.

Note: The VWC is situated 23 km north of a known Cape Vulture colony on Nelson's Kop as well as two other roost sites (<35 km radius of the project area). The status of this colony has been confirmed as a breeding colony. As such, the decision-making hierarchy / philosophy is going to be based on the flow diagram for Cape Vultures as presented in the 2018 best practice document entitled Cape Vulture and Wind Farms Guidelines for Impact Assessment, monitoring and Mitigation (**Figure 9-3**).

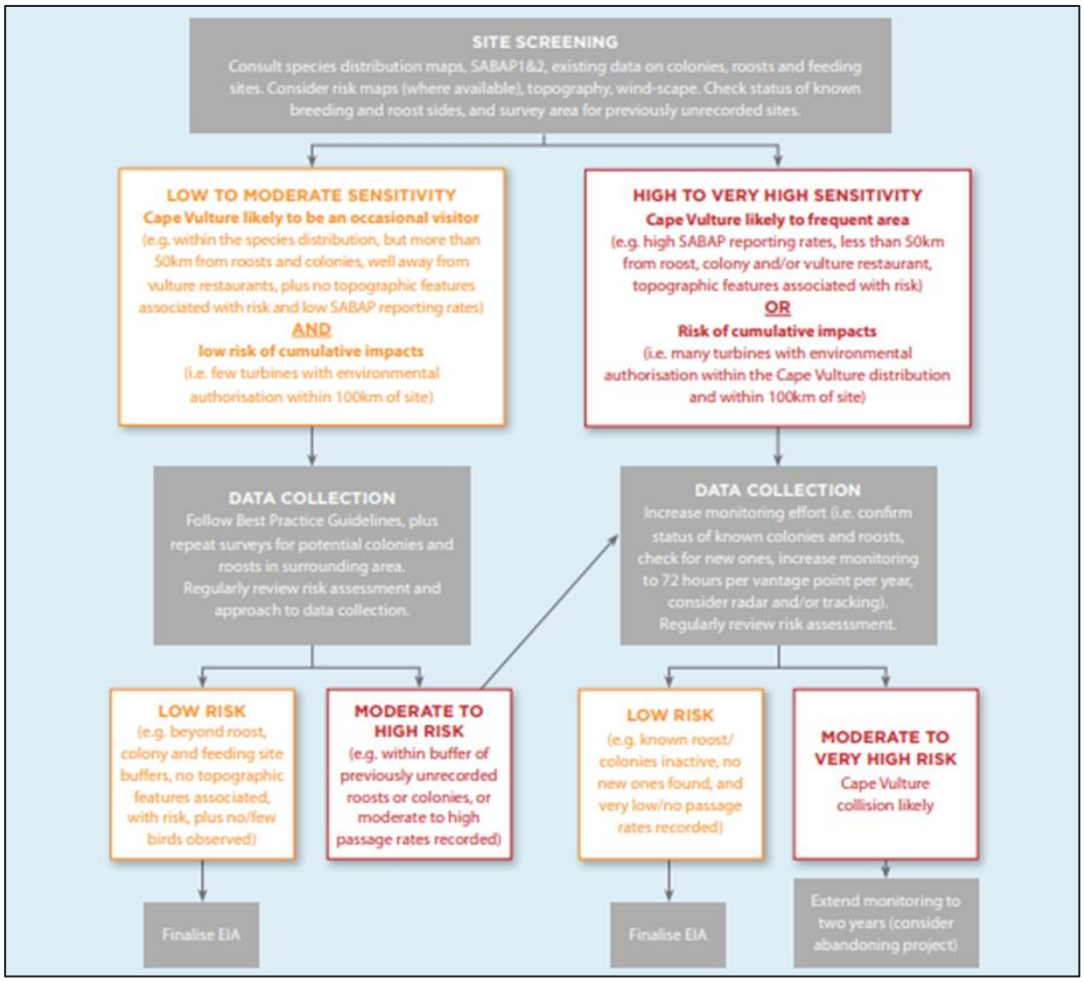

Figure 9-3 - Decision hierarchy as applicable to Cape Vulture sensitive areas (BLSA, 2018).

The Avifauna studies will be undertaken with specific consideration of the Multi-species Biodiversity Management Plan for Vultures in South Africa, implemented under the provisions of section 43(1)(b) and (c) and 43(3)(a) and (b) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

The scope of the applicable avifauna specialist studies will, amongst other aspects, also be aimed at determining the specific impact on resident breeding species of vultures and other raptors in the relevant geographic range of the proposed Project.

During the public participation phase, the outcomes of the identified impacts, specific to the geographical region, will in collaboration with the relevant avifauna specialists, conservation stakeholders, regulators and landowners, be circularised and thoroughly canvassed.

The objective is to ensure that an inclusive and transparent consultation process between relevant, informed, suitably qualified and experienced stakeholders, culminate in a comprehensive strategic and bespoke Vulture and Raptor Action Management Plan, informed by the Multi-species Biodiversity Management Plan for Vultures in South Africa, will be implemented for the duration of the project. The prioritisation of a Vulture and Raptor Action Management Plan is geared at not only adequately mitigate identified impacts, but to work together to strengthen concerted, collaborative, and coordinated efforts to conserve the vulture and other vulnerable bird populations to acceptable and sustainable levels.

9.5.4 ACOUSTIC IMPACT ASSESSMENT

The environmental acoustic specialist study for the Groothoek WEF will follow the NEMA *Protocol For Specialist Assessment And Minimum Report Content Requirements For Noise Impacts* (GNR 320, Government Gazette 43110, March 2020). The study will form part of the EIA phase and will comprise the following:

9.5.4.1 Preliminary Modelling

As per the IFC EHS Guidelines for Wind Energy methodology (IFC, 2015), a preliminary modelling exercise will be conducted using a simple model, which assumes hemispherical propagation of noise from each turbine. Such modelling will focus on receptors located within a 2 km radius of the turbines.

If the preliminary model suggests that turbine noise at all sensitive receptors is likely to be below an LA90 level of 35 dB(A) at a wind speed of 10 m/s (at a 10 m height) during the daytime and night-time, then this preliminary modelling is likely to be sufficient to assess the noise impact of the proposed Project. If the LA90 levels at any receptor location are above 35 dB(A) then a more detailed acoustic study may need to be conducted, which includes comprehensive baseline monitoring. Alternatively, input into the micro-siting of the turbines will be provided to avoid unwanted impacts or further detailed studies.

In low noise environments, the ETSU-R-97 report itself, however, stipulates that noise from wind farms should be limited to a range between 35 and 40 dB(A) (daytime). Additionally, a fixed limit of 43 dB(A) should be implemented during night-time. This should increase to 45 dB(A) (day and night) if the potential receptors have financial investments in the facility. With the Groothoek WEF being located within a low noise environment, a combination of the IFC and ETSU methodology will be followed in the assessment.

9.5.4.2 Environmental Acoustic Impact Assessment Report

A detailed Environmental Acoustic Impact Assessment report will be provided detailing the findings of the preliminary modelling, associated impacts, any inputs into micro-siting, as well as detailed recommendations, including mitigation measures if deemed necessary. The Environmental Acoustic Impact Assessment report will align with the requirements of the NEMA *Protocol For Specialist Assessment And Minimum Report Content Requirements For Noise Impacts* (GNR 320, Government Gazette 43110, March 2020), with the relevant sections cross-referenced therein.

9.5.5 TRAFFIC IMPACT ASSESSMENT

The report deals with the traffic impact on the surrounding road network in the vicinity of the site during the:

- Construction phase;
- Operational phase; and
- Decommissioning phase.

This transport study includes the following tasks:

- Project Assessment
  - Communication with the project team to gain sound understanding of the project.
  - Overview of available project background information including, but not limited to, location maps, site development plans, anticipated vehicles to the site (vehicle type and volume), components to be transported and any resulting abnormal loads.
  - Research of all available documentation and information relevant to the proposed facility.
- Access and Internal Roads Assessment
  - Assessment of the proposed access points including:
    - Feasible location of access points
    - Motorised and non-motorised access requirements
    - Stacking distances, if required
    - Sight distances and required access spacing
    - Comments on internal circulation requirements and observations
- Haulage Route Assessment
  - Determination of possible haulage routes to site regarding:
    - National routes
    - Local routes
    - Site access points
    - Road limitations due to abnormal loads
- Traffic Estimation and Impact
  - Construction, operational, and decommissioning phase vehicle trips
    - Generated vehicles trips
    - Abnormal load trips
    - Access requirements
  - Investigation of the impact of the development traffic generated during construction, operation, and decommissioning.
- Report (Documentation)
  - Reporting on all findings and preparation of the report.

9.5.6 VISUAL

- Evaluating different project alternatives in terms of their anticipated visual impact, as relevant (refer to Section 8 of the VIA).
- Determining the magnitude of potential impacts (refer to Section 9.3 of the VIA) within the existing visual context by considering the proposed project in terms of:
    - Visibility (refer to Section 9.2.1 of the VIA)
    - Visual intrusion (refer to Section 9.2.2 of the VIA)
    - Visual exposure (refer to Section 9.2.3 of the VIA)
- Assessing the impact significance (refer to Section 9.4 of the VIA) by relating the magnitude of the visual impact to:
    - Duration
    - Severity
    - Geographical extent
- Revising the preliminary cumulative impact assessment (refer to Section 10 of the VIA).
- Based on the outcomes of the impact assessment, refining mitigation measures (refer to
- Section 11 of the VIA) to reduce the potential negative visual impacts of the project, were feasible.

9.5.7 TERRESTRIAL BIODIVERSITY

The intactness of Critical Biodiversity Areas that overlap with the Project area will be assessed and reported on after the Wet season survey to ensure species composition and abundance is accounted for as many species are senescent during the dry season. Development within natural state areas (areas of high sensitivity) should be avoided to the degree possible. If development is to commence in these areas, a biodiversity offset strategy will be required during the EIA phase and will be relevant to all species themes.

9.5.7.1 Plant Species Conservation Concern

Although all vegetation types found within the site are listed as Least Concern by the RLE (2021), areas of primary and secondary grassland, woodlands and wetlands have the potential to support plant SCC. Twelve plant SCC have been identified as having a high likelihood of occurrence within the study area. A detailed botanical field survey to confirm the presence of these species on site will be undertaken during the wet season (Oct 2024 -Jan 2025). The survey will also be used to map vegetation communities and assess their ecological condition, to inform the assessment of Site Ecological Importance (SEI) and inform the need for design mitigation (avoidance) plus identification of any requirement for offset where significant residual impacts are unavoidable.

9.5.7.2 Animal Species of Conservation Concern

The majority of the study area is indicated by the DFFE Screening Tool (2020) as being of ‘very high’ sensitivity for the faunal species theme due to the presence of 32 species (those identified in the screening report and the additional species identified from the literature review) that are likely to occur within the Project area.

Baseline animal species field surveys to establish the presence of these species on site, with a focus on mammal and herpetofauna species, was conducted during the dry season (June-July

2024), wet season surveys (Oct 2024 -Dec 2024) seasons are also scheduled. In addition, an assessment of site suitability for support of invertebrate SCC will be done to determine whether dedicated invertebrate surveys are required

9.5.8 AQUATIC BIODIVERSITY IMPACT ASSESSMENT

Given the extent and importance of agricultural activities in the region, the availability and protection of water and freshwater ecosystems is considered of prime importance, and efforts must be made to ensure that wherever possible, the proposed wind energy facility does not impact negatively on the freshwater ecosystems. Although total avoidance of all freshwater ecosystems is unlikely to be feasible, particularly in terms of linear infrastructure (access roads and powerlines), the information presented in the scoping report will be utilised during the planning phase to ensure that as far as possible, infrastructure is placed outside of the freshwater ecosystems and their buffer zones.

A full aquatic baseline survey, consisting of high and low flow surveys of fish and macroinvertebrates, habitats and in-situ water quality, will be performed on river systems within the project area of influence, so that the potential significance of risks posed by the proposed WEF development can be assessed and mitigation measures refined accordingly.

9.6 IMPACT ASSESSMENT METHODOLOGY

9.6.1 ASSESSMENT OF IMPACTS AND MITIGATION

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct[5], indirect[6], secondary[7] as well as cumulative[8] impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria[9] presented in **Table 9-4.**

[5] Impacts that arise directly from activities that form an integral part of the Project.
[6] Impacts that arise indirectly from activities not explicitly forming part of the Project.
[7] Secondary or induced impacts caused by a change in the Project environment.
[8] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.
[9] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

Table 9-4 – Impact Assessment Criterion and Scoring System

Criteria	Score 1	Score 2	Score 3	Score 4	Score 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
Impact Significance Rating					
Total Score	**4 to 15**	**16 to 30**	**31 to 60**	**61 to 80**	**81 to 100**
Environmental Significance Rating (Negative (-))	**Very low**	**Low**	**Moderate**	**High**	**Very High**
Environmental Significance Rating (Positive (+))	**Very low**	**Low**	**Moderate**	**High**	**Very High**

9.6.2 IMPACT MITIGATION

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of

mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in **Figure 9-4** below.

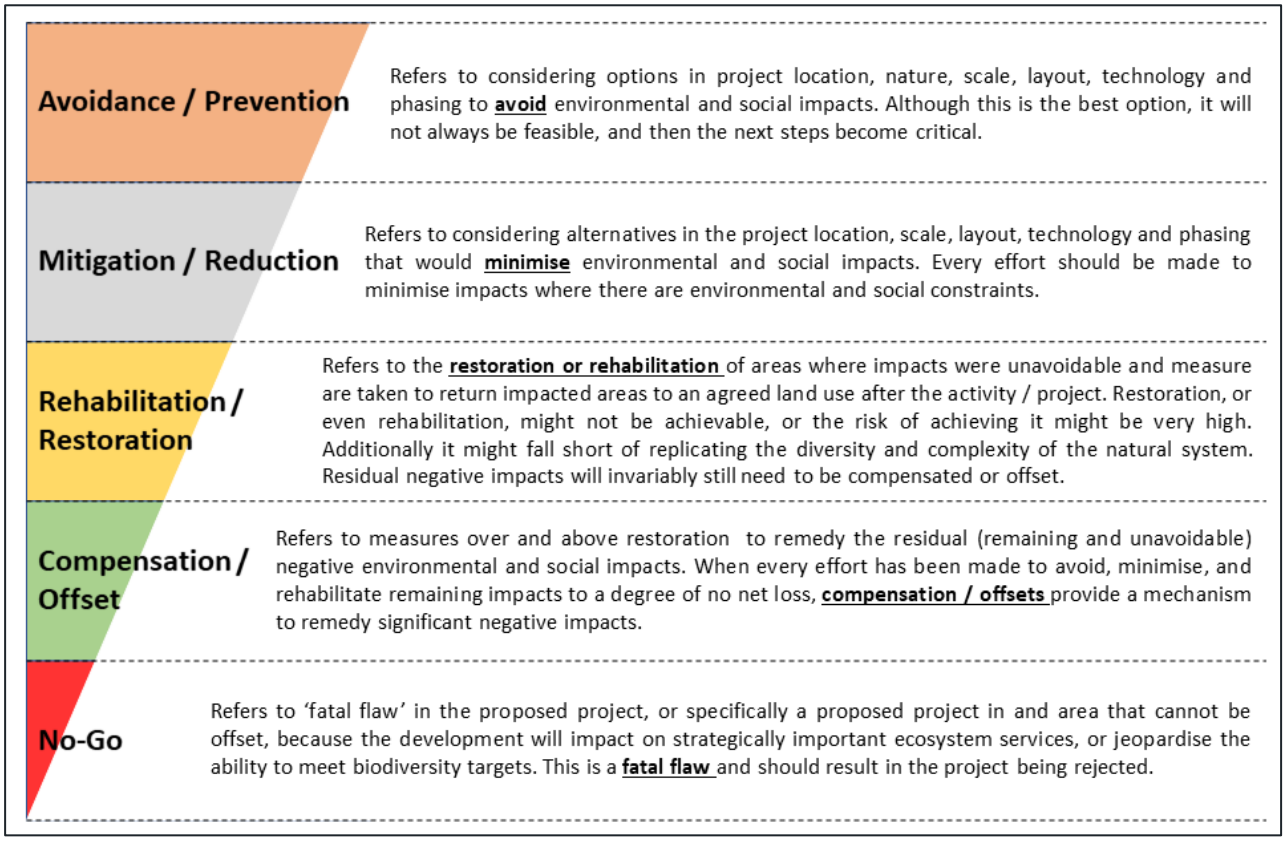

Figure 9-4 - Mitigation Sequence/Hierarchy

The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is

encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

9.7 ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Once the FSR has been approved the proposed project will proceed into detailed EIA phase, which involves the detailed specialist investigations.

WSP will produce a Draft EIA Report after the completion of the required specialist studies. The Draft EIAR will provide an assessment of all the identified key issues and associated impacts from the Scoping phase. All requirements as contemplated in the EIA Regulations, 2014 (GNR 982, as amended) will be included in the Draft EIAR.

The Draft EIAR will contain, inter alia, the following:

- Details of the EAP who prepared the report and the expertise of the EAP to carry out the S&EIR process, including a curriculum vitae;
- The location of the activity, including the 21 digit Surveyor General code of each cadastral land parcel, where available, the physical address and farm name; and the coordinates of the boundary of the property or properties;
- A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale;
- A description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the associated structures and infrastructure related to the proposed project;
- 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;
- A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location;
- A motivation for the preferred development footprint within the approved site;
- A full description of the process followed to reach the proposed development footprint within the approved site;
- Details of the public participation process undertaken;
- 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;
- The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts;
- The methodology used in determining and ranking of potential environmental impacts and risks;
- Positive and negative impacts;
- An assessment of each identified potentially significant impact and risk;
- The possible mitigation measures that could be applied;

- An environmental impact statement;
- A description of any assumptions, uncertainties and gaps in knowledge;
- A reasoned opinion as to whether the proposed activity should or should not be authorised;
- An undertaking under oath or affirmation by the EAP; and
- An EMPr.

9.8 STAKEHOLDER AND AUTHORITY ENGAGEMENT

Public participation during the EIA phase revolves around the review of the environmental impact assessment findings, which will be presented in the Draft EIA Report. All stakeholders will be notified of the progress to date and availability of the Draft EIA Report, via mail, email and/or SMS. A legislated period of 30 consecutive days will be allowed for public comment. Reports will be made available in the following way:

- Distribution for comment at central public places, which were used during the Scoping phase;
- The document will be made available to download from the WSP and Datafree websites; and
- Copies of CDs will be made available on request.

The EIA phase will provide the following information to I&APs:

- Initial Site Plan;
- Alternatives;
- A description of activities and operations to be undertaken;
- Baseline information;
- Specialist studies;
- Impact assessment; and
- Management measures.

The information outlined above will be presented in one or more of the following:

- Notifications;
- Scoping Report;
- EIA Report; and
- EMPr.

All comments received during the EIA phase will be recorded in the Comments and Responses table within the SER, which will be included in the draft and final EIA Reports. The final EIA Report will incorporate public comment received on the Draft EIA Report and will be made available for public review with hard copies distributed mainly to the authorities and key stakeholders.

All stakeholders will receive a letter notifying them of the authority's decision.

10 CONCLUSION AND WAY FORWARD

This FSR contains:

- A description of the existing and proposed activities;
- A description of the alternatives considered to date;
- An outline of the proposed process to be followed;
- Information on the EAP and stakeholders who have chosen to participate in the project;
- An outline of the environment in which the project falls;
- Information on the potential environmental impacts to be studied in more detail during the EIAR phase of the project; and
- Information on the proposed specialist studies to be undertaken.

A number of environmental impacts have been identified as requiring some more in-depth investigation and the identification of detailed mitigation measures. Therefore, a detailed EIA is required to be undertaken in order to provide an assessment of these potential impacts and recommend appropriate mitigation measures. All specialist studies and identified mitigations will be assessed, verified and ground-truthed during the EIA phase.

The recommendation of this report is that detailed specialist studies as outlined in **Section 9.5** are undertaken.

The DSR was available for review from **22 January 2025 - 21 February 2025.** All issues and comments submitted to WSP were incorporated in the Comments and Responses Table of the SER (**Appendix C**).

This FSR has been submitted to the delegated competent authorities responsible for authorising this project.

If you have any further enquiries, please feel free to contact:

Please submit all comments or queries to:

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