NGXWABANGU WIND ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE NEAR COFIMVABA, EASTERN CAPE PROVINCE
STORMBERG REDZ

DFFE Reference Number: TBA
DFFE Pre-Application Reference: 2022-11-0011

DRAFT BASIC ASSESSMENT REPORT

PREPARED FOR:

NGXWABANGU WIND POWER (PTY) LTD
Waterfront Business Park, Building 4, First Floor,
1204 Humerail Road, Humerail, 6001
+27 (0)41 506 4900

PREPARED BY:

GRAHAMSTOWN/MAKHANDA BRANCH
67 African Street, Grahamstown, 6139
+27 (0)46 622 2364
c.evans@cesnet.co.za / a.carter@cesnet.co.za
CES also has offices in East London, Port Elizabeth, Cape Town, Johannesburg and Maputo (Mozambique)
www.cesnet.co.za

MAY 2023

Report Title: Ngxwabangu Wind Energy Facility and Associated Infrastructure, Basic Assessment Report
Report Version: Draft
Department of Forestry, Fisheries and the Environment (DFFE) Reference Number: TBC

Environmental Assessment Practitioner (EAP) Details:

EAP:	**Dr Alan Carter**
Address:	**39 Harewood Drive, Nahoon, East London, 5214**
Telephone:	**+27 (0)43 726 7809**
E-mail:	**a.carter@cesnet.co.za**

EAP Declaration

- I act as the independent environmental practitioner in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not;
- All of the particulars furnished by me in this form are true and correct; and
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations.

ENVIRONMENTAL CONSULTANT	RESPONSIBILITY	DATE
Alan Carter	*EAP, Project Leader & Author*	May 2023
Caroline Evans	*Project Manager & Co-Author*	May 2023
Robyn Thomson	*Co-Author & GIS Mapping*	May 2023

THE CONTENTS OF A BASIC ASSESSMENT REPORT

CONTENT OF THE BASIC ASSESSMENT REPORT (APPENDIX 2, NEMA EIA REGULATIONS)
The Environmental Impact Assessment (EIA) Regulations, promulgated in terms of the National Environmental Management Act (NEMA) (Act no. 107 of 1998, as amended) dated 8th of December 2014, which have subsequently undergone amendments. In terms of Appendix 1 (3) of the EIA Regulations (2014, as amended), a Basic Assessment Report (BAR) must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include –

SCOPE OF ASSESSMENT AND CONTENT OF BASIC ASSESSMENT REPORTS	
(a) Details of – (i) The EAP who prepared the report; and (ii) The expertise of the EAP, including a curriculum vitae.	**Chapter 1 and Appendix A**
(b) The location of the activity, including – (i) The 21-digit Surveyor General code of each cadastral land parcel; (ii) Where available, the physical address and farm name; and (iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	**Chapter 2**
(c) A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale, or, if it is – (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	**Chapter 2**
(d) A description of the scope of the proposed activity, including – (i) All listed and specified activities triggered and being applied for; and (ii) A description of the activities to be undertaken, including associated structures and infrastructure.	**Chapter 3**
(e) A description of the policy and legislative context within which the development is proposed including (i) An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks and instruments.	**Chapter 3**
(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.	**Chapter 4**
(g) A motivation for the preferred site, activity and technology alternative.	**Chapter 6**
(h) A full description of the process followed to reach the proposed preferred alternative within the site, including – (i) Details of all the alternatives considered; (ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) The impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts – aa. Can be reversed; bb. May cause irreplaceable loss of resources; and cc. Can be avoided, managed or mitigated;	**Chapter 6 and Chapter 7**

(vi) The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) The possible mitigation measures that could be applied and level of residual risk; (ix) The outcome of the site selection matrix; (x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and (xi) A concluding statement indicating the preferred alternatives, including the preferred location of the activity.	
(i) A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including – (i) A description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	**Chapter 8**
(j) An assessment of each identified potentially significant impact and risk, including – (i) Cumulative impacts; (ii) The nature, significance and consequences of the impact and risk; (iii) The extent and duration of the impact and risk; (iv) The probability of the impact and risk occurring; (v) The degree to which the impact and risk can be reversed; (vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) The degree to which the impact and risk can be avoided, managed, or mitigated.	**Chapter 8**
(k) Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report.	**Chapter 7**
(l) An environmental impact statement which contains – (i) A summary of the key findings of the environmental impact assessment; (ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	**Chapter 9**
(m) Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for inclusion in the EMPr.	**Chapter 8**
(n) Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of the authorisation.	***None to date***
(o) A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed.	**Chapter 9**
(p) A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	**Chapter 9**
(q) Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post-construction monitoring requirements finalised.	*Not Applicable*
(r) An undertaking under oath or affirmation by the EAP in relation to – (i) The correctness of the information provided in the reports; (ii) The inclusion of comments and inputs from stakeholders and I&APs; (iii) The inclusion of inputs and recommendations from the specialist reports where relevant; and	**Appendix B**

	(iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	
(s)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post-decommissioning management of negative environmental impacts.	*None to date*
(t)	Any specific information that may be required by the competent authority.	**Appendix I**
(u)	Any other matters required in terms of section 24 (4)(a) and (b) of the Act.	*None to date*

ENVIRONMENTAL ASSESSMENT TEAM

Environmental Consultants	**Alan Carter,** EAP, Project Leader & Author *CES* **Caroline Evans,** Project Manager & Author *CES* **Robyn Thomson,** Co-Author & GIS Mapping *CES*
Biodiversity Offset Specialist	**Greer Hawley,** Biodiversity Specialist *Big Thorn Biodiversity*
Aquatic Specialist	**Brian Colloty,** Aquatic Specialist *EnviroSci*
Avifaunal Specialist	**Jon Smallie,** Avifaunal Specialist *WildSkies Ecological Services*
Bat Specialist	**Caroline Lötter,** Bat Specialist *Inkululeko Wildlife Services*
Ecological Specialists	**Luc Strydom,** Ecological Specialist (flora) *CES* **Elena Reljic,** Ecological Specialist (terrestrial fauna) *CES* **Ted Avis**, Ecological Specialist, Review *CES*
Heritage Specialist	**Nelius Kruger,** Archaeological Specialist *CES*
Noise Specialist	**Morné de Jager,** Acoustic Specialist *Enviro Acoustic Research, MENCO*
Paleontological Specialist	**John Almond,** Paleontological Specialist *Natura Viva*
Socio-Economic Specialist	**Matthew Keeley,** Social Specialist *Urban Econ*
Visual Specialist	**Bryony van Niekerk,** Visual Specialist *NuLeaf SA*

GENERAL SITE INFORMATION

NGXWABANGU WIND ENERGY FACILITY			
FARM NAME	**SG DIGIT NUMBER**	**FARM NUMBER/PORTION**	**AREA (HA)**
Nququ Plantation	**C10600000000006600000**	Portion 0 of Farm 66	1 390
Lower Nququ	**C10600000000009500000**	Portion 0 of Farm 95	4 605
Farm 98	**C10600000000009800000**	Portion 0 of Farm 98	2 589
Mcambalala	**C10600000000010100000**	Portion 0 of Farm 101	3 048
Farm 123	**C10600000000012300000**	Portion 0 of Farm 123	885
Ngxwabangu	**C10600000000017000000**	Portion 0 of Farm 170	3 110
Ngcagca	**C10600000000018100000**	Portion 0 of Farm 181	1450
Upper Ncuncuzo	**C10600000000018400000**	Portion 0 of Farm 184	2 284
Ncuncuzo	**C10600000000018300000**	Portion 0 of Farm 183	5 674
Mtshanyana	**C10600000000018800000**	Portion 0 of Farm 188	3 723
		TOTAL	**28 758**

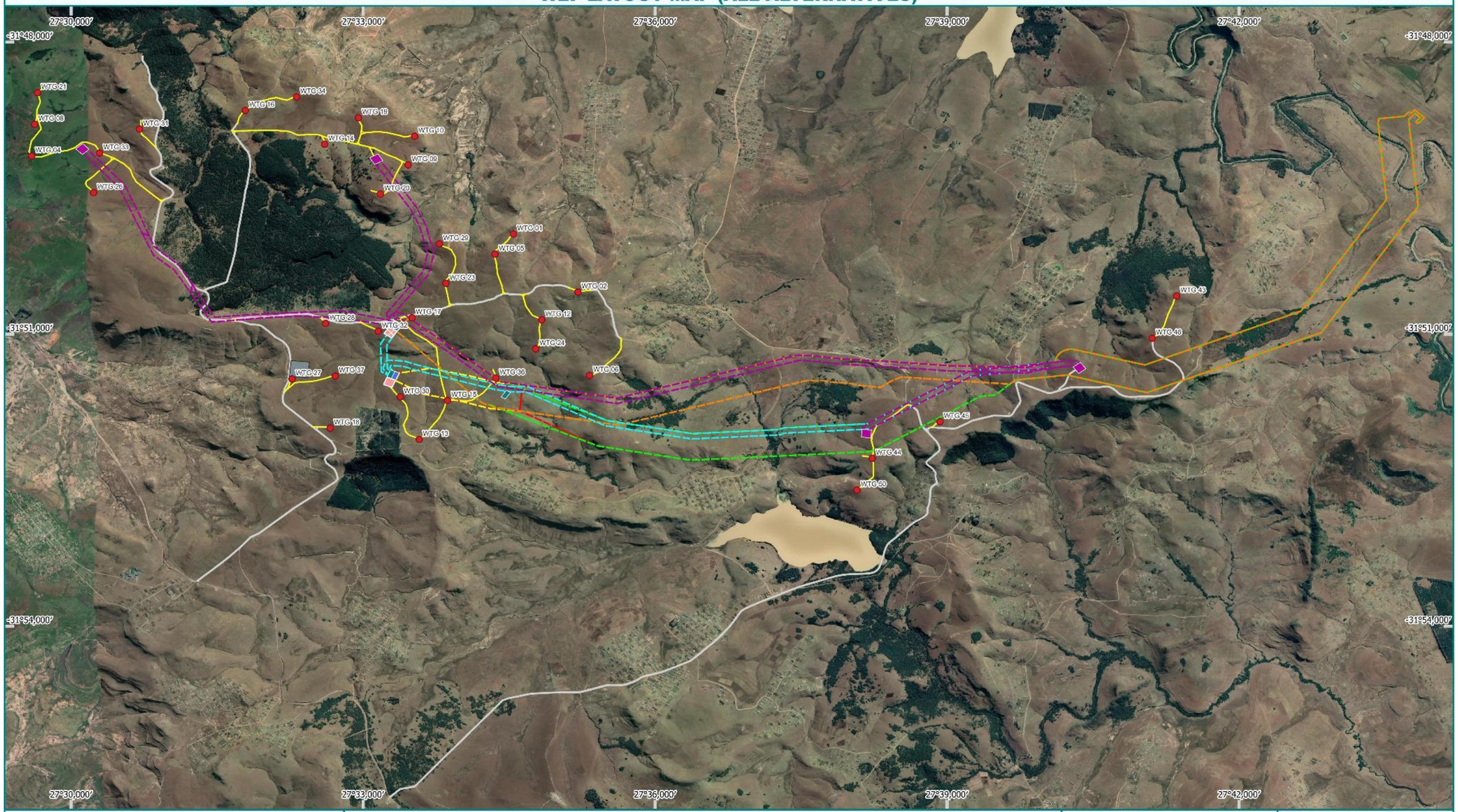
NGXWABANGU WEF DESIGN SPECIFICATIONS	
Number of turbines	Up to 36
Power output per turbine	Unspecified
Facility output	Up to 260 MW
Turbine hub height	Up to 130 m
Turbine rotor diameter	Up to 170 m
Turbine blade length	Up to 85 m
Turbine upper tip height	Up to 215 m
Turbine lower tip height	30 m
IPP Substations (SS)	33kV
Collector Substations (SS)	33kV
Eskom Substation (SS)	33/132kV
Connecting Overhead Line (OHL)	Up to 132kV
Length of Connecting OHL	Up to 22 km
Conductor Type of OHL	Tern Conductor
Tower Type of OHL	Monopole and/or Lattice Structures
Connecting Cabling	33kV (underground, where technically feasible)
Access Roads	Two Access Points
Main Facility Roads	15 m (construction phase), to be rehabilitated to 8m (operational phase)
OHL Service Road	Up to 3 m jeep track
BESS Technology	Solid State (Li-Ion) or REDOX-Flow
REDZ	Stormberg

ONSITE MEASURED WIND PARAMETERS
85 m masts were installed on the 4th of November 2012 and decommissioned on the 5th of November 2013. A 120 m mast was then installed on the 3rd of March 2016, and it is still collecting data.

LAYOUT MAP

NGXWABANGU WEF

WEF LAYOUT MAP (ALL ALTERNATIVES)



MAP DETAILS

Date: May 2023
Drawn by: Robyn Thomson
Datum: WGS 84

SCALE

0 — 2 000 — 4 000 m

LEGEND

- Turbines
- BESS (preferred)
- BESS
- Eskom substation (preferred)
- Eskom substation
- IPP substations (preferred)
- IPP substations
- Collector substations
- 33kV OHL 100m buffer option 2a (preferred)
- 33kV OHL 100m buffer option 1a
- Eskom 132kV OHL corridor 2a (preferred)
- Eskom 132kV OHL corridor 2b
- Eskom 132kV OHL corridor 1a
- Eskom 132kV OHL corridor 1b
- Proposed new roads
- Existing roads to be upgraded
- Temporary Laydown Area, Construction Compound and CTMF

SITE IN SOUTH AFRICA

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ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

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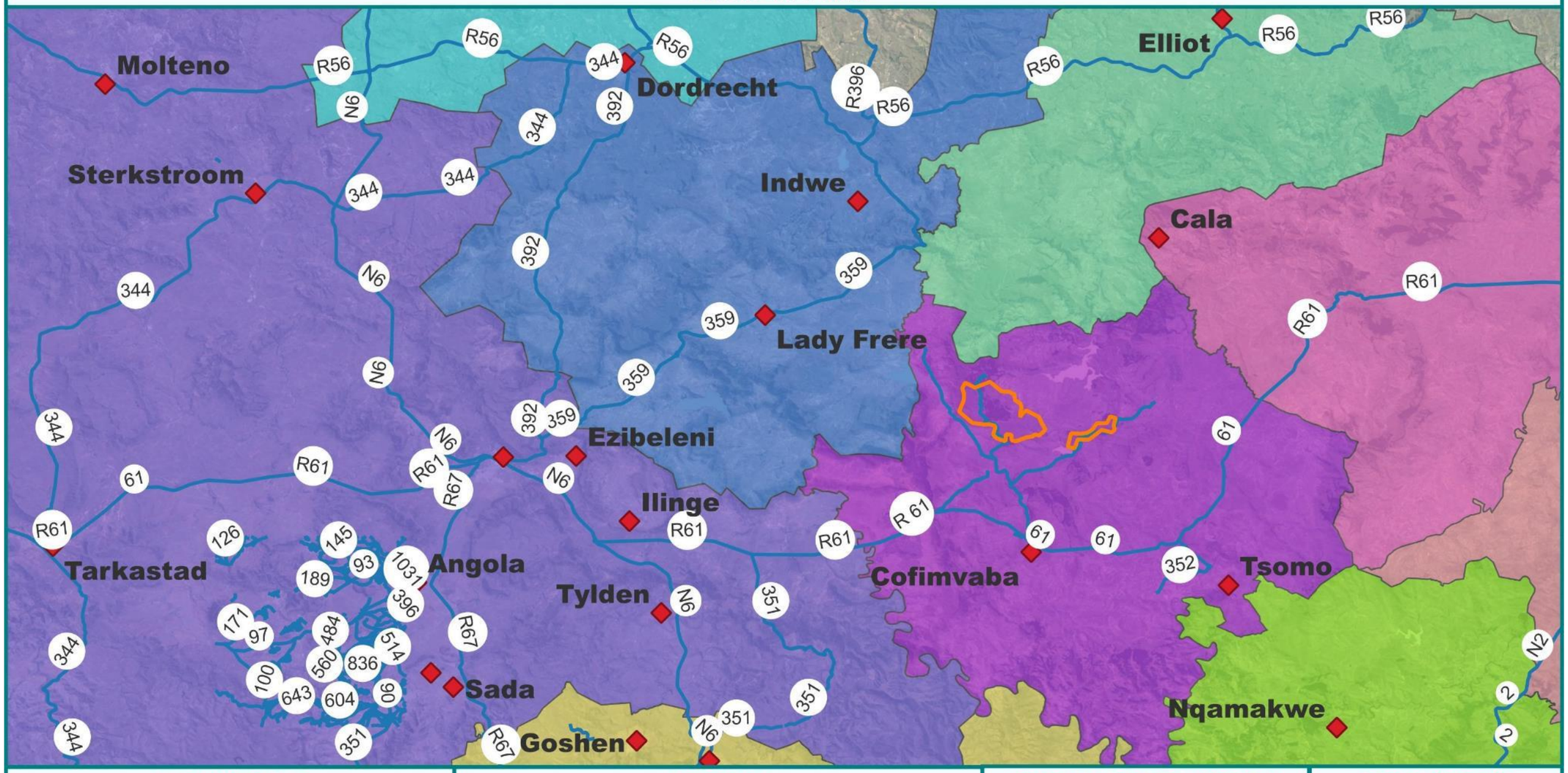
EDF renewables

NGXWABANGU WEF

LOCALITY MAP



MAP DETAILS

Date: October 2022
Drawn by: Robyn Thomson
Datum: WGS 84

SCALE

0 10 20 km

LEGEND

Main Roads

Local Municipalities

- Amahlathi
- Emalahleni
- Engcobo
- Enoch Mgijima
- Intsika Yethu
- Mbhashe
- Mnquma
- Sakhisizwe
- Walter Sisulu

SITE IN SOUTH AFRICA

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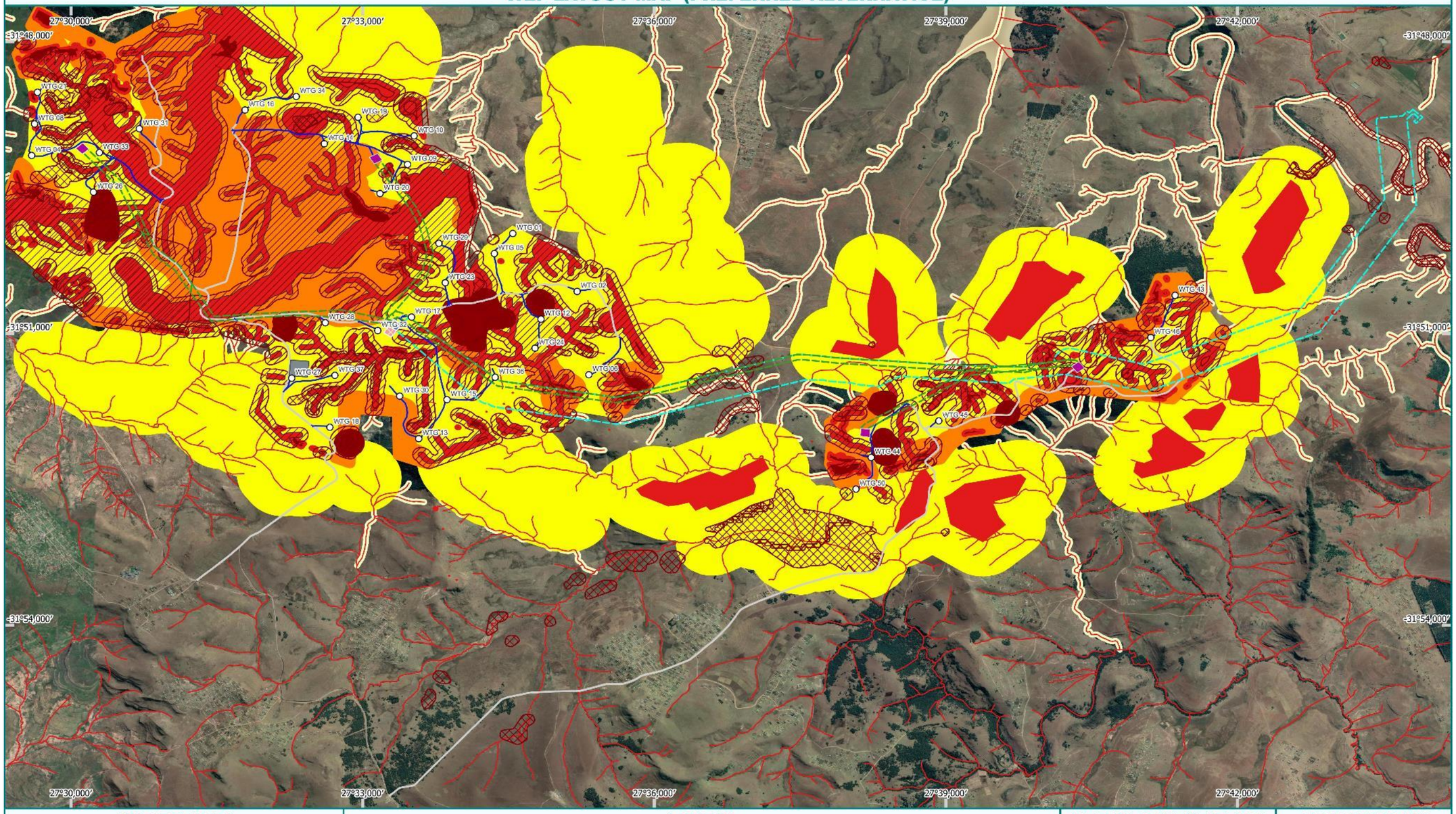
CONSOLIDATED SENSITIVITY MAP

NGXWABANGU WEF

WEF LAYOUT MAP (PREFERRED ALTERNATIVE)



MAP DETAILS

Date: May 2023
Drawn by: Robyn Thomson
Datum: WGS 84

SCALE

0 — 2 000 — 4 000 m

LEGEND

- Turbines
- Proposed new roads
- Existing roads to be upgraded
- Temporary Laydown Area, Construction Compound and CTMF
- BESS (preferred)
- Eskom infrastructure (preferred)
- IPP substations (preferred)
- Collector substations
- Internal 33kV OHL 100m buffer (preferred)
- Eskom 132kV OHL corridor 2a (preferred)
- No-go turbines
- No-go except OHL
- No-go
- High
- Medium to high
- Bats medium
- Low

SITE IN SOUTH AFRICA

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1 INTRODUCTION

1.1 BACKGROUND INFORMATION

Ngxwabangu Wind Power (Pty) Ltd., a subsidiary of EDF Renewables South Africa (Pty) Ltd. plans to develop, construct and operate a Wind Energy Facility (WEF) approximately 15 km North of Cofimvaba in the Eastern Cape Province. The project site is situated in the Intsika Yethu Local Municipality (LM) which forms part of the Chris Hani District Municipality (DM). The proposed Ngxwabangu WEF is situated within the Stormberg Renewable Energy Development Zone (REDZ4) which was promulgated in GN R. 840 for large scale wind and solar photovoltaic energy facilities. According to the data recorded by the applicant in the area as well as the WASA (Wind Atlas for South Africa, CSIR, 2018) this project site appears to have favourable wind conditions to operate a wind farm.

The proposed Ngxwabangu WEF will consist of up to 36 turbines, with a total facility output of up to 260MW. The WEF will also include up to four (4) 33kV medium voltage internal collector substations (SS), two (2) 33kV medium voltage underground powerlines of up to 6km and 9km in length (two alternatives), a 33 kV medium voltage Overhead Line (OHL) of approximately 12km to connect the northern section to the southern section of the site, an IPP SS (two alternatives) which will include a 33kV/132kV Switching Station (SWS) area in order to connect the WEF to the existing Eskom Substation via a 132kV OHL (two alternatives). The WEF will also include a Battery Energy Storage System (BESS) (two alternatives), temporary and permanent laydown areas, a Concrete Tower Manufacturing Facility (CTMF), a Construction Compound (CC), and access roads. The construction footprint of the proposed WEF will be up to 209 ha (inclusive of roads), rehabilitated to an operational footprint of up to 118 ha (inclusive of roads).

CES has been appointed by Ngxwabangu Wind Power (Pty) Ltd. as the Environmental Assessment Practitioner (EAP) to conduct the necessary BA Process for the project in terms of the (NEMA) EIA Regulations (2014, as amended).

It must be emphasised that the previous Application for EA (DFFE Ref.: 14/12/16/3/3/1/2674), and associated BAR, have been withdrawn. The proposed Ngxwabangu WEF was applied for, without the OHL infrastructure and without a Biodiversity Offset Plan, in November 2022. The initial project description was for a total of 50 turbines which were assessed by specialists. The outcomes of the Draft BAR and specialist process was that a number of turbines would need to be removed/relocated due to sensitivities and the recommendation by the Ecological Specialist and the EAP was that a Biodiversity Offset Strategy would be required.

A new approach was then followed, and this new application now includes a reduced number of turbines, a Biodiversity Offset Strategy and a holistic application which includes all infrastructure in one application. This has been done to ensure that the Offset Strategy and specialist assessments consider the facility as a whole, in one application. We strongly believe that this makes for a more transparent process which allows Stakeholders and I&APs to consider the Ngxwabangu WEF and associated infrastructure as a full project.

1.2 PURPOSE OF THE BASIC ASSESSMENT (BA) PROCESS

The objective of the BA process, as set out by the NEMA EIA Regulations (2014, as amended), is to, "*through a consultative process-*
(a) Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
(b) Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;

(c) Identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
(d) Determine the—
(i) Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
(ii) Degree to which these impacts—
(aa) Can be reversed;
(bb) May cause irreplaceable loss of resources, and
(cc) Can be avoided, managed or mitigated;
(e) Identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;
(f) Identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;
(g) Identify suitable measures to avoid, manage or mitigate identified impacts; and
(h) Identify residual risks that need to be managed and monitored".

1.3 NATURE AND STRUCTURE OF THIS REPORT

The structure of this report is based on Appendix 2 of GN R. 982 (326), of the EIA Regulations (2014, as amended), which clearly specifies the required content of a Basic Assessment Report (BAR).

1.3.1 STRUCTURE

The structure of this BAR is as per Table 1-2 below.

Table 1-2: Structure of the BAR

CHAPTER	HEADING	CONTENT
1	**Introduction**	Provides a brief overview of the proposed development, details of the EAP and project team and purpose of the BA report.
2	**Project description**	Provides a description of the proposed development, the properties on which the development is to be undertaken and the location of the development on the property.
3	**Need and Desirability**	A description of the need and desirability/motivation for the project.
4	**Legal and Policy Framework**	Identifies all the legislation and guidelines that have been considered in the preparation of this BA Report. In addition, this chapter includes a description of the BA process.
5	**Environmental Baseline**	Provides a brief overview of the bio-physical characteristics of the site and its environs that may be impacted by the proposed development, compiled largely from published information.
6	**Social Baseline**	Provides a brief overview of the socio-economic characteristics of the site and its environs that may be impacted by the proposed development, compiled largely from published information.
7	**Alternatives**	A description of the fundamental alternatives, incremental alternatives and the no-go alternative considered during all phases of the proposed development have been detailed in this Chapter.
8	**Findings of the Specialist Reports**	This chapter provides a summary of the key findings of each specialist assessment conducted as part of the BA.

9	**Impacts and risks identified during the BAR Process**	Provides a description of the key impacts that have been identified by the project team and through discussions with I&APs thus far in the BA process. In addition, this chapter covers the impacts identified by each specialist assessment. This chapter also includes mitigation measures that must be implemented. The chapter also describes the cumulative assessment methodology and a summary of the cumulative impacts as identified by each specialist assessment and in general by the BA. This chapter also includes mitigation measures that should be implemented.
10	**Ngxwabangu WEF Sensitivity Analysis**	This chapter illustrates the site development sensitivity map that was developed based on specialist and general site information gathered, where the site was classified into areas of GO (unrestricted development), GO-BUT (conditional development) and NO-GO (no development).
11	**Public Participation**	This chapter describers the Public Participation Process (PPP) conducted to date and that will be conducted as part of the BA.
12	**Conclusions and Recommendations**	Concludes the report and provides recommendations on the way forward.
13	**APPENDIX A**	EAP Affirmation and Declaration
14	**APPENDIX B**	Curriculum vitae of EAP team
15	**APPENDIX C**	Full Impacts Tables (A3)
16	**APPENDIX D**	Specialist Reports
17	**APPENDIX E**	Biodiversity Offset Strategy
18	**APPENDIX F**	Specialist Declarations and CVs
19	**APPENDIX G**	Environmental Management Programme (EMPr) prepared in accordance with Appendix 4 of the EIA Regulations 2014, as amended. And a Generic EMPr prepared due to the presence of Substations.
20	**APPENDIX H**	PPP Proofs
21	**APPENDIX I**	Comments and Response Report (CRR)

1.3.2 Assumptions and Limitations

This report is based on currently available information and, as a result, the following limitations and assumptions are implicit–

- This report is based on a project description and site plan, provided to CES by the applicant, which has not been approved by DFFE at this stage of the project. The project description and site plan may undergo iterations and refinements before being regarded as final. A project description, based on the final design, will be concluded once DFFE has had the opportunity to review ground truthing reports during a separate EMPr and Layout process, should the EA be granted.
- Descriptions of the natural and social environments are based on limited fieldwork and available literature.
- It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the accompanying maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken.

1.4 Details and Expertise of the Environmental Assessment Practitioner

In fulfilment with the legislative requirements, the details of the Environmental Assessment Practitioner (EAP) and the environmental team that prepared this BAR are provided below.

1.4.1 Dr Alan Carter (The EAP, Project Leader & Author)

Alan is an Executive and the East London Branch Manager at CES. He has extensive training and experience in both financial accounting and environmental science disciplines with CES for the past 20 years and with international accounting firms in South Africa and the USA for 10 years. He is a member of the American Institute of Certified Public Accountants (licensed in Texas) and holds a PhD in Plant Sciences. He is also certified ISO14001 EMS Auditor with the American National Standards Institute. Alan has been responsible for leading and managing numerous and varied consulting projects over the past 30 years. He is a registered professional with the South African Council for Natural Scientific Professionals (SACNASP) and through Environmental Assessment Practitioners Association of South Africa (EAPASA).

1.4.2 Ms Caroline Evans (Project Manager & Co-Author)

Caroline is a Principal Environmental Consultant with more than 8 years' experience and she is based in the Grahamstown branch. She holds a BSc with majors in Environmental Science (distinction) and Zoology, as well as a BSc (Hons) in Environmental Science (distinction) both from Rhodes University. Her undergraduate degree included both commerce and natural sciences. Caroline's honours dissertation evaluated the economic impacts of degradation of the xeric subtropical thicket through farming practices, focusing on the rehabilitation potential of the affected areas in terms of carbon tax. She has a broad academic background including statistics, economics, management, climate change, wetland ecology, GIS, rehabilitation ecology, ecological modelling and zoology. Caroline has a strong focus on renewable energy and South African policy and legislation related to development.

1.4.3 Ms Robyn Thomson (Co-Author & GIS Mapping)

Robyn Thomson is a Principal Environmental Consultant with 16 Years's experience. She holds a BSc degree with majors in Archaeology, Environmental and Geographical Science, as well as a BSc Honours in Environmental Science from the University of Cape Town and Rhodes University respectively. Robyn's key experience includes renewable energy developments, linear developments, residential developments and mining developments, with her main interest being on renewable energy. Her areas of expertise include project management, basic assessment processes, scoping and EIA process, the environmental authorisation (EA) amendment processes, the public participation process (PPP), water use licence applications and associated reports, and GIS mapping. Robyn completed both the Introduction to Environmental Impact Assessment Procedure and Introduction to Environmental Risk Assessment Short Courses by Coastal and Environmental Services and the Department of Environmental Science, Rhodes University, respectively. In addition, Robyn is a member of the International Association for Impact Assessment (IAIA). Her experience with renewable energy facilities and associated infrastructure includes the management and report writing for various components of the Chaba, Haga Haga, and Great Kei WEFs in the Great Kei LM, Albany WEF in the Makana LM, and Ngxwabangu WEF in the Intsika Yethu LM, Eastern Cape; the Waaihoek WEF in the Emadlangeni LM, Kwa-Zulu Natal; and the Soyuz WEFs in the Pixley Ka Seme DM, Northern Cape.

PLEASE FIND THE *CURRICULUM VITAE* ATTACHED AS APPENDIX B.

2 PROJECT DESCRIPTION

2.1 PROPOSED ACTIVITY

Ngxwabangu Wind Power (Pty) Ltd., a subsidiary of EDF Renewables South Africa (Pty) Ltd. plans to develop, construct and operate a Wind Energy Facility (WEF) approximately 15 km North of Cofimvaba in the Eastern Cape Province. The project site is situated in the Intsika Yethu Local Municipality (LM) which forms part of the Chris Hani District Municipality (DM). The proposed Ngxwabangu WEF is situated within the Stormberg Renewable Energy Development Zone (REDZ4) which was promulgated in GN R. 840 for large scale wind and solar photovoltaic energy facilities.

The proposed Ngxwabangu WEF will consist of up to 36 turbines, with a total facility output of up to 260MW. The WEF will also include up to four (4) 33kV medium voltage internal collector substations (SS), two (2) 33kV medium voltage underground powerlines of up to 6km and 9km in length (two alternatives), a 33 kV medium voltage Overhead Line (OHL) of approximately 12km to connect the northern section to the southern section of the site, an IPP SS (two alternatives) which will include a 33kV/132kV Switching Station area in order to connect the WEF to the existing Eskom Substation via a 132kV OHL (two alternatives). The WEF will also include a Battery Energy Storage System (BESS) (two alternatives), temporary and permanent laydown areas, a Concrete Tower Manufacturing Facility (CTMF), a Construction Compound (CC), and access roads. The construction footprint of the proposed WEF will be up to 209 ha (inclusive of roads), rehabilitated to an operational footprint of up to 118 ha (inclusive of roads). Please see Figure 2-1 for the layout map.

In summary, the proposed Ngxwabangu WEF will include:

- Up to 36 turbines with a maximum nominal power output of up to 260MW.
- The proposed WEF will include turbines with a hub height of up to 130m, a rotor diameter of up to 170m, blade length of up to 85m, and a maximum tip height of up to 215m and a lower tip height of 30m.
- Permanent laydown areas adjacent to each wind turbine (up to 4 000 m^2).
- Temporary laydown areas adjacent to each wind turbine (up to 3 150 m^2).
- Foundations (up to 900 m^2) for each wind turbine.
- An IPP Substation of up to 4ha (inclusive of a 33/132kV Eskom Substation, offices and parking and a permanent Substation laydown area). Two alternatives are proposed:
  - IPP Substation Alternative 1: situated in southern area.
  - IPP Substation Alternative 2: situated in the northern area. This is the preferred alternative.
- Four (4) Collector Substations of up 3ha each (33kV). Two (2) of the Collector Substations are situated within the western cluster of turbines and two (2) of the Collector Substations are situated within the eastern cluster of turbines.
- Temporary Laydown Area, Temporary Buffer Yard, Temporary Batching Plant, Temporary CTMF and Temporary Site Camp (Construction Compound) of up to 9ha.
- BESS of up to 3ha. Two alternatives are proposed:
  - BESS Alternative 1: Situated adjacent to the southern IPP Substation (Alternative 1).
  - BESS Alternative 2: Situated adjacent to the northern IPP Substation (Alternative 2). This is the preferred alternative.
- Two (2) medium voltage underground powerlines (up to 33kV) between the Collector Substation and the IPP Substation of up to 6km and 9km in length. Two alternatives are proposed:
  - 33kV Powerline Alternative 1: Connecting the Northern and Eastern Collector Substations to the southern IPP Substation (Alternative 1).
  - 33kV Powerline Alternative 2: Connecting the Northern and Eastern Collector Substations to the northern IPP Substation (Alternative 2). This is the preferred alternative.
- A 33kV medium voltage OHL of approximately 12km to connect the northern section to the southern section of the site.
- Ngxwabangu WEF will require Grid Infrastructure in order to connect to the existing Eskom Grid network. This is proposed via a 132kV OHL from the proposed onsite IPP Substation (33/132kV) to the existing

Qolweni Substation. The proposed OHL will be strung with a single circuit tern conductor, up to 22km in length. Four alternatives are being considered.

- Alternative 1a is proposed from the southern IPP Substation (Alternative 1). This OHL is 132kV and is up to 20km in length.
- Alternative 1b is proposed from the southern IPP Substation (Alternative 1). This OHL is 132kV and is up to 20km in length.
- Alternative 2a is proposed from the northern IPP Substation (Alternative 2). This OHL is 132kV and is up to 20km in length. This is the preferred alternative (2a)
- Alternative 2b is proposed from the northern IPP Substation (Alternative 2). This OHL is 132kV and is up to 20km in length.

- Medium voltage cabling (up to 33kV) between turbines and the collector substations, to be laid underground and along roads, where technically feasible.
- Internal access roads of up 101km constructed at up to 15m wide (construction phase), rehabilitated to 8m wide (operational phase). Existing roads will be used as far as possible. However, where required, internal access roads will be constructed between the turbines.

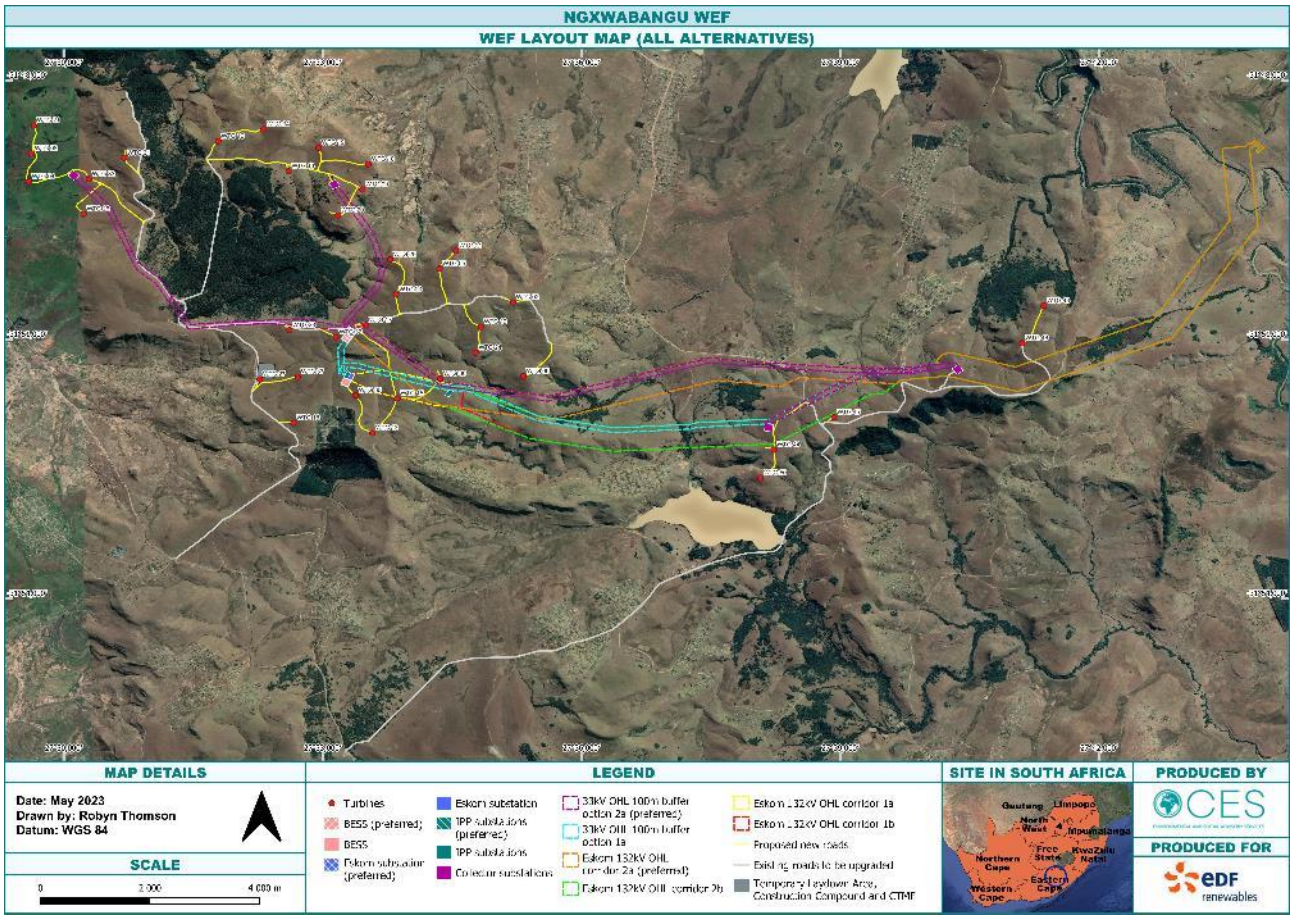


Figure 2-1: Layout Map of the Proposed Ngxwabangu WEF.

CES has been appointed by Ngxwabangu Wind Power as the Environmental Assessment Practitioner (EAP) to conduct the necessary BA Process for the project in terms of the NEMA EIA Regulations (2014, as amended).

The turbine footprints and associated facility infrastructure (internal access roads, substations, construction compound, batching plant and operations building) will potentially cover a total combined area of approximately 209 ha during the construction phase. This footprint will be reduced through rehabilitation, resulting in a maximum final total combined footprint of approximately 118 ha.

The footprint of the facility is calculated as follows:

Table 2-1: Construction Footprint of the Ngxwabangu WEF.

FACILITY COMPONENT	CONSTRUCTION FOOTPRINT (PRE-MITIGATION)	OPERATIONAL FOOTPRINT (POST-MITIGATION)
Permanent Turbine Laydown Area	TOTAL 4 000 m^2 x 36 turbines = 144 000 m^2 which equates to **14.400 ha**	TOTAL 4 000 m^2 x 36 turbines = 144 000 m^2 which equates to **14.400 ha**
Permanent Turbine Foundation Area	TOTAL Up to 900m^2 x 36 turbines = 32 400 m^2 which equates to **3.240 ha**	TOTAL Up to 900m^2 x 36 turbines = 32 400 m^2 which equates to **3.240 ha**
Permanent Turbine Transformer Area	TOTAL Up to 25m^2 x 36 turbines = 900 m^2 which equates to **0.090 ha**	TOTAL Up to 25m^2 x 36 turbines = 900 m^2 which equates to **0.090 ha**
Permanent BESS Area	TOTAL Up to 30 000m^2 which equates to **3.000 ha**	TOTAL Up to 30 000m^2 which equates to **3.000 ha**
Permanent IPP Substation (including a 33/132kV Switching Station)	TOTAL Up to 40 000m^2 = 40 000 m^2 which equates to **4.000 ha**	TOTAL Up to 40 000m^2 = 40 000 m^2 which equates to **4.000 ha**
Permanent Collector Substations (33kV)	TOTAL Up to 30 000m^2 x 4 = 120 000 m^2 which equates to **12.000 ha**	TOTAL Up to 30 000m^2 x 4 = 120 000 m^2 which equates to **12.000 ha**
Permanent WEF Gatehouse	TOTAL Up to 40m^2 which equates to **0.004 ha**	TOTAL Up to 40m^2 which equates to **0.004 ha**
Temporary Turbine Laydown Area	TOTAL 3 150 m^2 x 36 turbines = 113 400 m^2 which equates to **11.340 ha**	TOTAL 0 m^2 x 36 turbines = 0m^2 which equates to **0.000 ha**
Temporary WEF Site Camp **Temporary WEF Laydown Area** **Temporary WEF CTMF Area** **Temporary Buffer Yard** **Temporary WEF Batching Plant**	TOTAL Up to 90 000m^2 which equates to **9.000 ha**	TOTAL Up to 0m^2 which equates to **0.000 ha**
New Internal Access Roads (15 m construction, rehabilitated to 8 m during operation)	TOTAL Up to 57 000 m x 15m = 855 000 m^2 which equates to **85.500 ha**	TOTAL Up to 57 000 m x 8m = 456 000 m^2 which equates to **45.600 ha**
Upgraded Existing Internal Access Roads (15 m construction, rehabilitated to 8 m during operation)	TOTAL Up to 44 000 m x 15m = 660 000 m^2 which equates to **66.000 ha**	TOTAL Up to 44 000 m x 8m = 352 000 m^2 which equates to **35.200 ha**
TOTAL FOOTPRINT:	**Up to 57.074 ha** ***of clearing needed for the construction phase of the development of the proposed WEF (excluding roads)*** **Up to 208.574 ha** ***of clearing needed for the construction phase of the development of the proposed WEF (including roads)***	**Up to 36.734 ha** ***of clearing remaining during the post-construction operational phase (after rehabilitation) of the proposed WEF (excluding roads)*** **Up to 117.534 ha** ***of clearing remaining during the post-construction operational phase (after rehabilitation) of the proposed WEF (including roads)***

In summary, the Ngxwabangu WEF includes the following dimensions of WEF design specifications (Table 2-2).

Table 2-2: Ngxwabangu WEF Design Specifications.

NGXWABANGU WEF DESIGN SPECIFICATIONS	
Number of turbines	Up to 36
Power output per turbine	Unspecified
Facility output	Up to 260 MW
Turbine hub height	Up to 130 m

Turbine rotor diameter	Up to 170 m
Turbine blade length	Up to 85 m
Turbine upper tip height	Up to 215 m
Turbine lower tip height	30 m
IPP Substations (SS)	33kV
Collector Substations (SS)	33kV
Eskom Substation (SS)	33/132kV
Connecting Overhead Line (OHL)	Up to 132kV
Length of Connecting OHL	Up to 22 km
Conductor Type of OHL	Tern Conductor
Tower Type of OHL	Monopole and/or Lattice Structures
Connecting Cabling	33kV (underground, where technically feasible)
Access Roads	Two Access Points
Main Facility Roads	15 m (construction phase), to be rehabilitated to 8m (operational phase)
OHL Service Road	Up to 3 m jeep track
BESS Technology	Solid State (Li-Ion) or REDOX-Flow
REDZ	Stormberg

2.2 PROJECT LOCALITY

Ngxwabangu Wind Power (Pty) Ltd., a subsidiary of EDF Renewables South Africa (Pty) Ltd. plans to develop, construct and operate a WEF approximately 15 km North of Cofimvaba in the Eastern Cape Province. The project site is situated in the Intsika Yethu LM which forms part of the Chris Hani DM. Table 2-3 indicates the towns in the vicinity of the proposed site and Table 2-4 lists the affected properties. The study site is approximately 29 000 ha in extent, of which Ngxwabangu WEF and associated infrastructure will cover a total combined area of ~209 ha during the construction phase, rehabilitated to ~118ha for the operational phase..

Table 2-3: Towns in the vicinity of the Ngxwabangu WEF.

TOWN NAME	APPROXIMATE DISTANCE	DIRECTION
Cofimvaba	15 km	South
Qamata	20 km	Southwest
Komani	40 km	West

Table 2-4: Ngxwabangu WEF Properties.

NGXWABANGU WIND ENERGY FACILITY			
FARM NAME	**SG DIGIT NUMBER**	**FARM NUMBER/PORTION**	**AREA (HA)**
Nququ Plantation	**C10600000000006600000**	Portion 0 of Farm 66	1 390
Lower Nququ	**C10600000000009500000**	Portion 0 of Farm 95	4 605
Farm 98	**C10600000000009800000**	Portion 0 of Farm 98	2 589
Mcambalala	**C10600000000010100000**	Portion 0 of Farm 101	3 048
Farm 123	**C10600000000012300000**	Portion 0 of Farm 123	885
Ngxwabangu	**C10600000000017000000**	Portion 0 of Farm 170	3 110
Ngcagca	**C10600000000018100000**	Portion 0 of Farm 181	1450
Upper Ncuncuzo	**C10600000000018400000**	Portion 0 of Farm 184	2 284
Ncuncuzo	**C10600000000018300000**	Portion 0 of Farm 183	5 674
Mtshanyana	**C10600000000018800000**	Portion 0 of Farm 188	3 723
		TOTAL	**28 758**

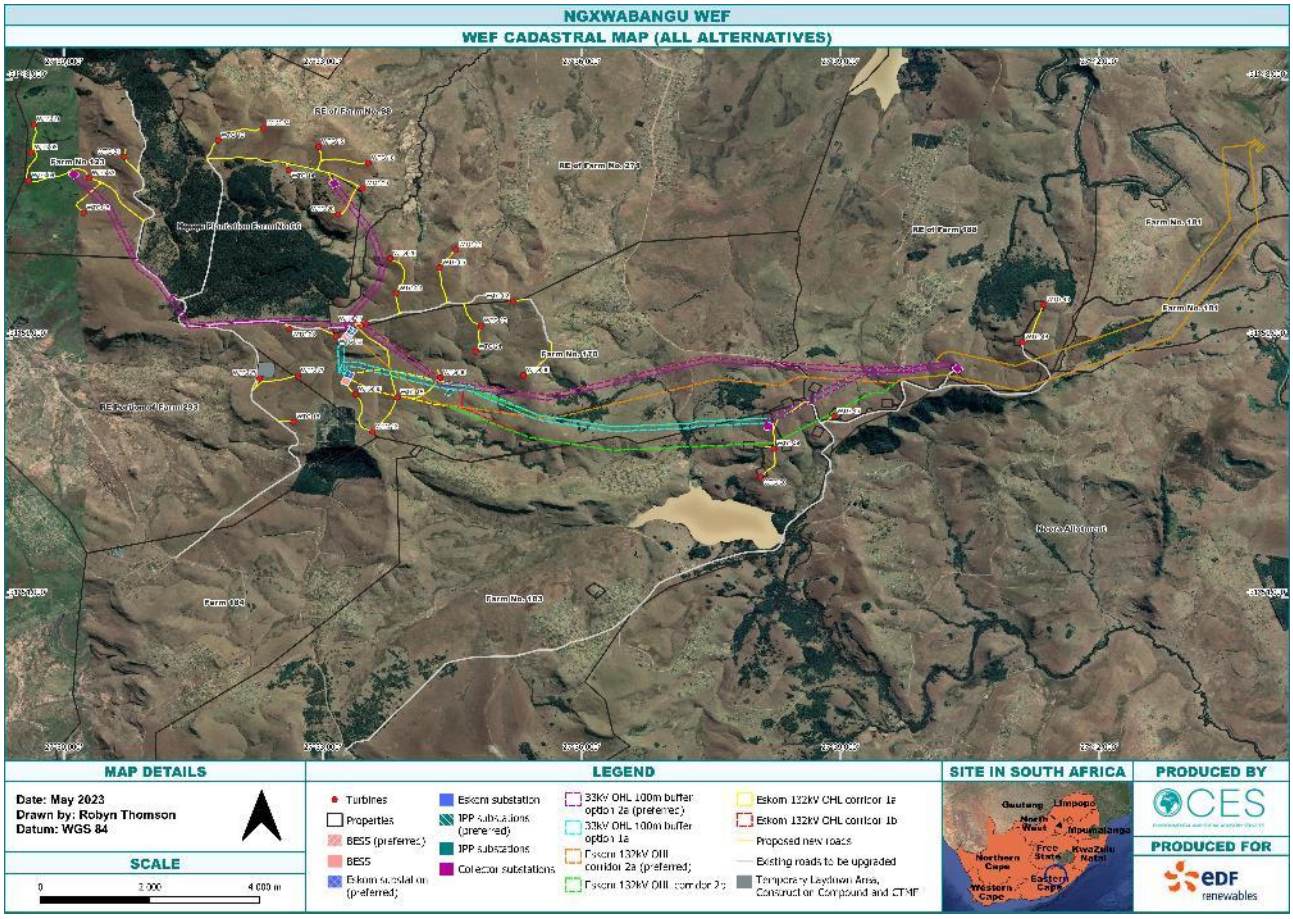


Figure 2-2: Cadastral Map of the Affected Properties within the Proposed Site.

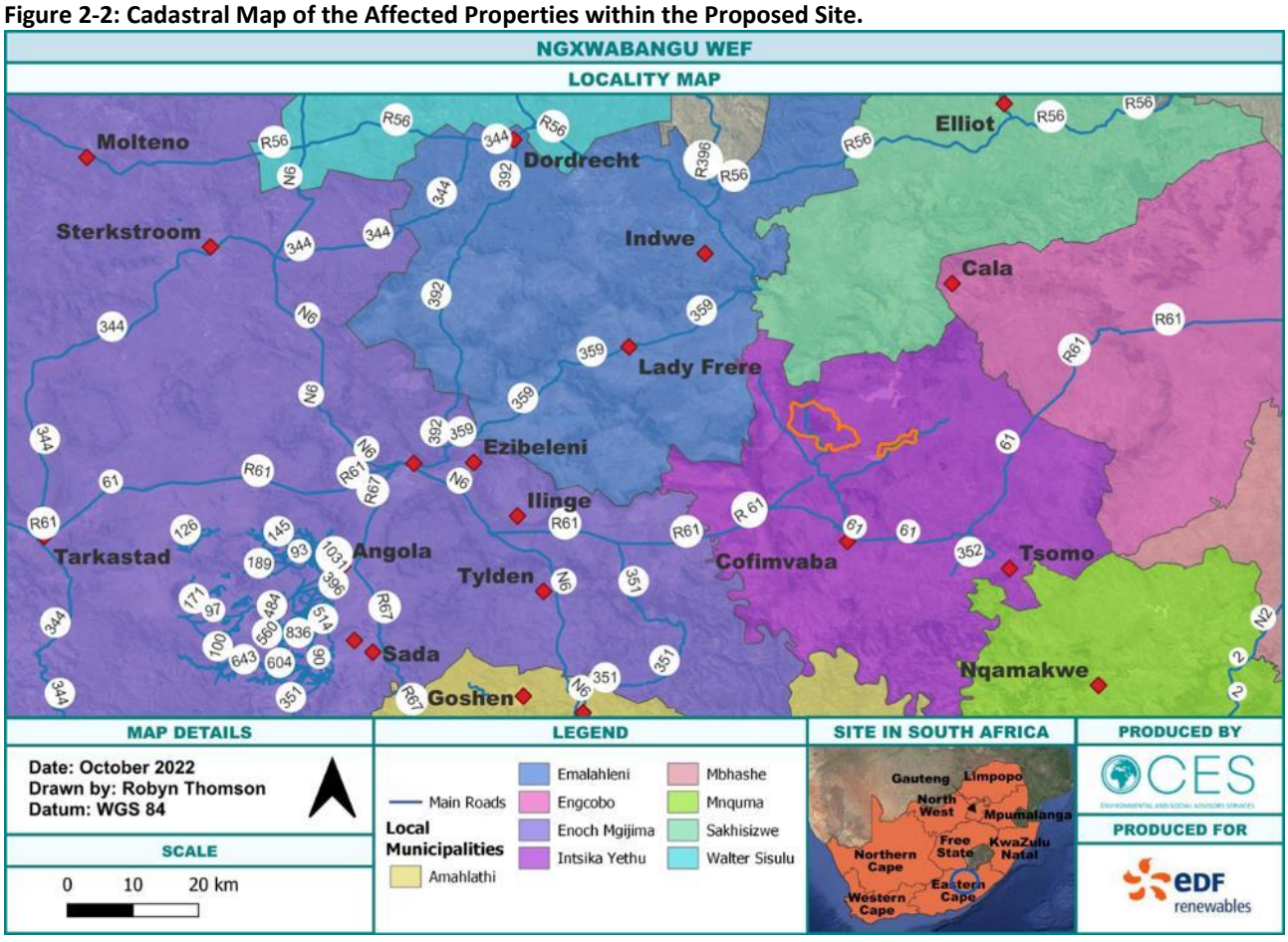


Figure 2-3: Locality Map of the Proposed Site.

2.3 ENVIRONMENTAL AUTHORISATIONS IN SOUTH AFRICA

The regulation and protection of the environment within South Africa, occurs mainly through the application of various items of legislation, within the regulatory framework of the Constitution (Act No. 108 of 1996).

The primary legislation regulating EIAs within South Africa is the NEMA (Act No. 107 of 1998 and subsequent amendments). The NEMA makes provision for the Minister of Environmental Affairs to identify activities which may not commence prior to authorisation from either the Minister or the provincial Member of the Executive Council ("the MEC"). In addition to this, the NEMA also provides for the formulation of regulations in respect of such authorisations.

Table 2-5: Relevant Legislation, Policies and Guidelines

TITLE OF LEGISLATION, POLICY OR GUIDELINE	RELEVANCE TO THE PROJECT
Constitution Act (Act No. 108 of 1996)	The Developer is obligated to ensure that the development of the proposed Ngxwabangu WEF will not result in pollution and ecological degradation. In addition, the Developer is obligated to ensure that the proposed Ngxwabangu WEF is ecologically sustainable and that it demonstrates economic and social development.
National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) Environmental Impact Assessment Regulations (2014, as amended)	The construction of the proposed Ngxwabangu WEF triggers listed activities in terms of Listing Notice 1, Listing Notice 2 and Listing Notice 3 of the NEMA EIA Regulations (2014, as amended). A Basic Assessment (BA) Process is being undertaken and an Environmental Authorisation (EA) is required from the national Department of Forestry, Fisheries and the Environment (DFFE) prior to the commencement of construction.
National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) Geographical areas for the development of renewable energy development zones (2021)	The geographical zones identified as important for the expansion of South Africa's energy mix were published on 10 March 2021 for implementation. The Notices are part of the alignment of regulations required for the effective implementation of national environmental management legislation in terms of the One Environmental System. They will also contribute to the expansion of the country's alternate energy mix as the country works towards a reduction in the reliance on coal for energy. The EA application process for REDZ projects has been shortened to allow for a smoother implementation of alternate energy growth in South Africa. It is also because the proactive site sensitivity work has been completed through two two-and-a-half-year Strategic Environmental Assessment (SEA) processes. These determined the environmental sensitivity of each of the zones and corridors. The expansion of energy supply within the pre-assessed strategic corridors will assist the country as it moves towards a low carbon and climate resilient economy.
National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004)	The proposed development of the Ngxwabangu WEF will require the clearance of sections of vegetation, specifically Drakensberg Foothill Moist Grassland and Tsomo Grassland (SANBI National Vegetation Map, 2018), which will impact on the biodiversity of the area. In addition, small patches of Southern Mistbelt Forest are present near the site, but are not impacted on by any infrastructure (SANBI National Vegetation Map, 2018). The proposed Ngxwabangu WEF development footprints could contain plant Species of Conservation Concern (SCC). The necessary permissions and/or permits must be obtained prior to the clearance of vegetation.
National Forestry Act (NFA) (Act No. 84 of 1998)	
Provincial Nature and Environmental Conservation Ordinance (No. 19 of 1974)	
National Water Act (NWA) (Act No. 36 of 1998, as amended)	Should the proposed Ngxwabangu WEF development trigger water use activities in terms of Section 21 of the NWA, authorisation will be required from the Department of Water and Sanitation (DWS) prior to the commencement of the construction phase. Regardless of whether Section 21 water uses are triggered, the DWS remains a stakeholder which will be notified of the proposed Ngxwabangu WEF. The proposed water use activities are being considered as part of this process.

TITLE OF LEGISLATION, POLICY OR GUIDELINE	RELEVANCE TO THE PROJECT
Mineral and Petroleum Resources Development Act (MPRDA) (Act No. 28 of 2002)	The Department of Mineral Resources and Energy (DMRE) should be made aware of the proposed development and any necessary approvals must be obtained from the DMRE prior to the commencement of these activities.
National Heritage Resources Act (NHRA) (Act No. 25 of 1999)	The proposed Ngxwabangu WEF development could impact sensitive heritage resources. The Eastern Cape Provincial Heritage Resources Authority (ECPHRA) and South African Heritage Resources Agency (SAHRA) will be informed of the proposed development and any relevant authorisation and/or permits must be obtained prior to the commencement of the construction phase.
National Environmental Management: Waste Act (NEM:WA) (Act No. 59 of 2008)	The Developer must ensure that all activities associated with the proposed Ngxwabangu WEF address waste-related matters in compliance with the requirements of the NEM:WA. The Developer should communicate with the affected municipalities to ensure that waste is disposed of at a suitably registered landfill site.
Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983)	The DFFE should be informed of the proposed Ngxwabangu WEF. An invasive species monitoring, control, and eradication plan for land/activities under their control should be developed as part of the environmental plans in accordance with CARA.
Electricity Regulation Act (Act No. 4 of 2006)	The proposed Ngxwabangu WEF must be in line with the Electricity Regulation Act.
Occupational Health and Safety Act (OHSA, Act No. 85 of 1993)	The Developer and the appointed Contractor must be mindful of the principles and broad liability and implications associated with the OHSA and mitigate any potential impacts which are identified prior to the construction phase.
National Environmental Management: Air Quality Act (NEM:AQA) (Act No. 39 of 2004)	No major air quality issues are expected due to the proposed Ngxwabangu WEF; however, the Developer and the appointed Contractor should be mindful of the potential impact associated with dust generation as a result of vegetation clearance during the construction phase.
National Road Traffic Act (NRTA) (Act No. 93 of 1996)	The Developer and the appointed Contractor must comply with all the requirements in terms of the NRTA during the various phases of the Ngxwabangu WEF development.
National Veld and Forest Fire Act (NVFFA) (Act No. 101 of 1998)	The Developer and the appointed Contractor must ensure that appropriate firefighting equipment, protective clothing, and trained personnel (for extinguishing fires) are present onsite during the construction of the Ngxwabangu WEF.
Intsika Yethu Local Municipality	The proposed Ngxwabangu WEF must comply with/be in line with all relevant municipal by-laws, the Spatial Development Framework (SDF) and the Integrated Development Plan (IDP). Representatives from the affected municipalities must be informed of the proposed development.
Chris Hani District Municipality	

Table 2-6 provides the relevant listed activities, in terms of the NEMA EIA Regulations (2014, as amended), which are likely to be triggered by the activities associated with the proposed Ngxwabangu WEF.

The NEMA EIA Regulations (2014, as amended) allow for a BA Process for activities with limited environmental impact (GN R. 983 and 985, 2014) and a more rigorous two (2) tiered approach to activities with potentially greater environmental impact (GN R. 984, 2014). This two-tiered approach includes both a Scoping and EIA Process. The proposed development of the Ngxwabangu WEF triggers the requirement of an EA from the national DFFE, due to the Listing Notice 1, 2, and 3 activities. The WEF falls entirely within a REDZ. Applications for environmental authorisation for large scale wind or solar photovoltaic energy facilities, when such facilities trigger activity 1 of Environmental Impact Assessment Regulations Listing Notice 2 of 2014 and any other listed and specified activities necessary for the realisation of such facilities, and where the entire proposed facility is to occur in such REDZs, must follow the BA procedure contemplated in Regulation 19 and 20 of the EIA Regulations (2014, as amended) in order to obtain EA, as required in terms of the Act. Thus, a BA Process is required.

Table 2-6: Listed activities triggered by the proposed Ngxwabangu WEF.

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 (GN R. 983)	Describe the portion of the proposed project to which the applicable listed activity relates.
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.***	**The proposed Ngxwabangu WEF development entails the construction of up to 132kV OHL connecting the WEF to the Eskom SS, 33kV OHL and underground powerlines as well as collector substations (33KV), IPP substations (33kV) and Eskom Switching Station (33/132kV), outside of urban areas and outside of industrial complexes.**
12 (ii)(a) and (c)	***The development of (ii) infrastructure or structures with a physical footprint of 100 square metres or more. Where such development occurs (a) within a watercourse and (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.***	**The proposed Ngxwabangu WEF will have a combined construction phase development footprint of up to 209 ha and some of the infrastructure is located within 32 metres of watercourses and wetlands.**
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.***	**This relates specifically to road and cable crossings that will be required during internal road construction and cable installation connecting the turbines as well as access road installation and upgrading for the WEF.**
24	***The development of a road– A road with a reserve wider the 13.5 metres, or where no reserve exists where the road is wider than 8 metres.***	**The road network will need to be developed and upgraded (using all technically feasible existing roads where possible) to ensure that the delivery of turbine parts is possible and that maintenance teams are able to access each individual turbine throughout the lifespan of the project. A 15 m road corridor may be temporarily impacted upon during the construction phase. The final road width will be 8 m.**
28(ii)	***Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.***	**The proposed Ngxwabangu WEF development requires the clearance of vegetation which exceeds 1 ha (up to 209 ha during the construction phase, up to 118 ha for the operational phase), on land which is used for agricultural purposes (grazing).**
56	***The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre.***	**The proposed Ngxwabangu WEF will require upgrades to existing roads to ensure that the construction width is 15m, rehabilitated to 8m for the operational phase.**
Activity No(s):	Provide the relevant **Scoping and EIA Activity(ies)** as set out in **Listing Notice 2** of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
1	***The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more.***	**The proposed Ngxwabangu WEF will include the construction of up to 36 turbines with a maximum output capacity of up to 260 MW. This WEF is classified as a renewable energy facility.**

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 (GN R. 983)	Describe the portion of the proposed project to which the applicable listed activity relates.
		The WEF falls entirely within a REDZ. Applications for EA for large scale wind or solar photovoltaic energy facilities, when such facilities trigger activity 1 of the EIA Regulations Listing Notice 2 (2014, as amended) and any other listed and specified activities necessary for the realisation of such facilities, and where the entire proposed facility is to occur in such REDZs, must follow the BA procedure contemplated in Regulation 19 and 20 of the EIA Regulations (2014, as amended) in order to obtain EA, as required in terms of the Act.
4	***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 more than 500 cubic meters.***	**This relates specifically to aspects such as storage of liquid electrolyte in flow state batteries (if this alternative is used for the proposed BESS). It also includes other storage such as transformer oil at the switching station sites and at the maintenance storage facility during operations. Also, small volumes of other chemicals may be stored during construction (including diesel and petrol) which may trigger this activity.** **The final layout, in terms of WEF ancillary facilities, will determine the volumes needed on site, but at this stage a rough estimate can be calculated as follows: the construction period is expected to last for approximately 24 months, during this time approximately 175m^3 of chemicals which can be classified as dangerous goods will be used. The operational phase is expected to last up to 25 years and will require approximately 200m^3 of chemicals which can be classified as dangerous goods. This equates to a total of approximately 375m^3 of dangerous goods for the lifespan of the proposed WEF.** **The WEF falls entirely within a REDZ. Applications for EA for large scale wind or solar photovoltaic energy facilities, when such facilities trigger activity 1 of the EIA Regulations Listing Notice 2 (2014, as amended) and any other listed and specified activities necessary for the realisation of such facilities, and where the entire proposed facility is to occur in such REDZs, must follow the BA procedure contemplated in Regulation 19 and 20 of the EIA Regulations (2014, as amended) in**

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 (GN R. 983)	Describe the portion of the proposed project to which the applicable listed activity relates.
		order to obtain EA, as required in terms of the Act.
15	***The clearance of an area of 20 hectares or more of indigenous vegetation.***	**The proposed development will include the clearing of indigenous vegetation. The total footprint of the proposed Ngxwabangu WEF will be up to 209 ha in extent (construction phase), rehabilitated to 118 ha in extent (operational phase). It must be noted that these figures in include the construction and upgrade of roads. Non-linear vegetation clearance is expected to be up to 58ha (construction phase), rehabilitated to up to 37ha (operational phase).** **The WEF falls entirely within a REDZ. Applications for EA for large scale wind or solar photovoltaic energy facilities, when such facilities trigger activity 1 of the EIA Regulations Listing Notice 2 (2014, as amended) and any other listed and specified activities necessary for the realisation of such facilities, and where the entire proposed facility is to occur in such REDZs, must follow the BA procedure contemplated in Regulation 19 and 20 of the EIA Regulations (2014, as amended) in order to obtain EA, as required in terms of the Act.**
Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 3** (GN R. 985)	Describe the portion of the proposed project to which the applicable listed activity relates.
4(a)i(bb)(ee)	***The development of a road wider than 4 metres with a reserve less than 13,5 metres.*** ***a. Eastern Cape*** ***i. Outside urban areas:*** ***(bb) National Protected Areas Expansion Strategy Focus areas;*** ***(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;***	**The proposed Ngxwabangu WEF is located within an area classified as a NPAES (2010/11) Focus Area (Tarkastad-Amathole). The WEF is also located within areas classified as both Critical Biodiversity Area (CBA) 1 and CBA 2 (ECBCP Terrestrial CBAs, 2019), and an ESA 1 (ECBCP Aquatic CBAs, 2019). The road network will need to be developed and upgraded (using all technically feasible existing roads where possible) to ensure that the delivery of turbine parts is possible and that maintenance teams are able to access each individual turbine throughout the lifespan of the project. A 15 m road corridor may be temporarily impacted upon during the construction phase. The final road width will be 8 m.**
10(a)i (bb)(ee)(ii)	***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***	**The proposed Ngxwabangu WEF will require the combined storage of a dangerous good, such as the storage of materials for the battery storage and the storage of fuel, which will exceed 30 m^3. In**

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 (GN R. 983)	Describe the portion of the proposed project to which the applicable listed activity relates.
	combined capacity of 30 but not exceeding 80 cubic metres in the – *a. Eastern Cape* *i. Outside urban areas* *(bb) National Protected Areas Expansion Strategy Focus areas;* *(ee) critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans,* *(ii) areas on the watercourse side of the development setback lines or within 100 metres from the edge of a watercourse where no such setback lines have been determined*	**addition, the proposed site is situated within 100 m of a few watercourses and wetlands, situated within a NPAES, and within areas classified as both CBA 1 and CBA 2 (ECBCP Terrestrial CBAs, 2019), and an ESA 1 (ECBCP Aquatic CBAs, 2019).**
12(a)(ii)	*The clearance of an area of 300 square metres or more of indigenous vegetation.* *a. Eastern Cape* *(ii) Within critical biodiversity areas identified in bioregional plans.*	**The proposed Ngxwabangu WEF Development requires the clearance of vegetation which exceeds 300 m^2 (209 ha). The WEF is located within areas classified as both CBA 1 and CBA 2 (ECBCP Terrestrial CBAs, 2019), and an ESA 1 (ECBCP Aquatic CBAs, 2019).**
14(ii)(a) and (c) (a)i(bb)(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, and* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse.* *a. Eastern Cape* *i. Outside urban areas:* *(bb) National Protected Areas Expansion Strategy Focus areas;* *(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*	**The total footprint of the proposed Ngxwabangu WEF will be up to 209 ha in extent (construction phase), rehabilitated to 118 ha in extent (operational phase). Some of the infrastructure may be located within 32 metres of a few watercourses and wetlands. The WEF is located within areas classified as a NPAES (Tarkastad-Amathole). The WEF is located within areas classified as both CBA 1 and CBA 2 (ECBCP Terrestrial CBAs, 2019), and an ESA 1 (ECBCP Aquatic CBAs, 2019).**
18a.i.(bb)(ee)	*The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.* *a. Eastern Cape* *i. Outside urban areas:* *(bb) National Protected Areas Expansion Strategy Focus areas;* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	**The proposed Ngxwabangu WEF is located within areas classified as a NPAES (Tarkastad-Amathole). The WEF is located within areas classified as both CBA 1 and CBA 2 (ECBCP Terrestrial CBAs, 2019), and an ESA 1 (ECBCP Aquatic CBAs, 2019). The road network will need to be developed and upgraded (using all technically feasible existing roads where possible) to ensure that the delivery of turbine parts is possible and that maintenance teams are able to access each individual turbine throughout the lifespan of the project. A 15 m road corridor may be temporarily impacted upon during the construction phase. The final road width will be 8 m.**

The Competent Authority that must consider and decide on the application for authorisation in respect of the activities, listed in Table 2-6 above, is the National DFFE, as the Department has reached an agreement with all Provinces that all electricity-related projects, including generation, transmission and distribution, are to be submitted to the National DFFE, irrespective of the legal status of the Applicant. This decision has been made in terms of Section 24(C)(3) of the NEMA (Act No. 107 of 1998 and subsequent amendments). In addition to this fact, this project is intended to be submitted as part of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

In addition to the requirements for an EA in terms of the NEMA, there may be additional legislative requirements that need to be considered prior to commencing with the activity, these include but are not limited to:

- National Heritage Resources Act (Act No. 25 of 1999);
- National Water Act (Act No. 36 of 1998) as amended;
- Civil Aviation Act (Act No. 74 of 1962) as amended;
- National Environmental Management Biodiversity Act (Act No. 10 of 2004);
- National Forests Act (Act No. 84 of 1998); and the
- Eastern Cape Nature and Environmental Conservation Ordinance (No. 19 of 1974).

These are discussed in detail in Chapter 4 of this report.

2.4 TECHNICAL: PROPOSED ACTIVITY

2.4.1 WIND ENERGY FACILITY (WEF)

The proposed Ngxwabangu WEF will consist of up to thirty-six (36) wind turbines with a proposed maximum output capacity of 260 MW.

Wind energy is a form of solar energy. Winds are caused by the uneven heating of the atmosphere by the sun, the irregularities of the earth's surface, and the rotation of the earth. Wind flow patterns are modified by the earth's terrain, bodies of water, and vegetation. This wind flow or motion energy (kinetic energy) can be used for generating electricity. The term “wind energy” describes the process by which wind is used to generate mechanical power or electricity. Wind turbines convert the kinetic energy in the wind into mechanical power and a generator can then be used to convert this mechanical power into electricity. The components of a typical wind turbine subsystem are depicted by Figure 2-4 below, and include:

- A rotor, or blades, which are the portion of the wind turbine that collect energy from the wind and convert the wind's energy into rotational shaft energy to turn the generator. The speed of rotation of the blades is controlled by the nacelle, which has the ability to turn the blades to face into the wind (‘yaw control’) and change the angle of the blades (‘pitch control’) to make the most use of the available wind. The maximum rotor diameter for the Ngxwabangu WEF turbines is up to 170 m.
- A nacelle (enclosure) containing a drive train, usually including a gearbox (some turbines do not require a gearbox) and a generator. The generator converts the turning motion of a wind turbine’s blades (mechanical energy) into electricity. Inside this component, coils of wire are rotated in a magnetic field to produce electricity. The nacelle is also fitted with brakes, so that the turbine can be switched off during very high winds, such as during storm events. This prevents the turbine from being damaged. All this information is recorded by computers and is transmitted to a control centre, which means that operators don't have to visit the turbine very often, but only occasionally for mechanical monitoring.
- A tower, to support the rotor and drive train the tower, on which a wind turbine is mounted is not only a support structure, but it also raises the wind turbine so that its blades safely clear the ground and can reach the stronger winds at higher elevations. The tower must also be strong enough to support the wind turbine and to sustain vibration, wind loading, and the overall weather elements for the lifetime of the turbine. The maximum hub height of the Ngxwabangu WEF turbines is up to 130 m.

- Electronic equipment such as controls, electrical cables, ground support equipment, and interconnection equipment.

2.4.2 STAGES OF WIND FARM DEVELOPMENT

Typically, building a wind farm is divided into four (4) phases, namely:

- Preliminary civil works;
- Construction;
- Operation; and
- Decommissioning.

A) PRELIMINARY CIVIL WORKS

Prior to the commencement of the main construction works, the Contractor will undertake vegetation clearance and site establishment works. The site establishment works may include the construction of one, or more, temporary construction compounds and laydown areas and the connection of services such as power and water to these compounds.

B) CONSTRUCTION

The construction footprint will include the platforms, or "crane pads" required to construct the wind turbines, new or upgraded access roads, lay-bys, component storage areas, turning heads and a substation to evacuate the electricity generated to the municipal or national grid.

A typical platform for the assembly of the crane and construction of the turbine is shown in Figure 2-5. These platforms will be connected by access roads with the following requirements:

- Minimum of 8 m width (5 m running width and 1.5 m verge either side) on straight sections with widening required on corners;
- Should a "crawler" type crane be used, then road widths of up to 15 m on straight sections may be required, of which 8 m would be retained for the life of the wind farm;
- Typical 300 mm deep road section;
- Maximum 10% vertical gradient on gravel roads;
- Turning heads provided within 200 m of each crane pad; and
- Passing places of c. 50 m length and 5 m width located approximately every 1 km.

The construction footprint required will be greater than the dimensions specified above to allow for construction of the wind farm infrastructure. These areas are used temporarily during the construction period – including temporary construction compound and road verges – and will be rehabilitated at the end of construction works to reduce the footprint on the land.

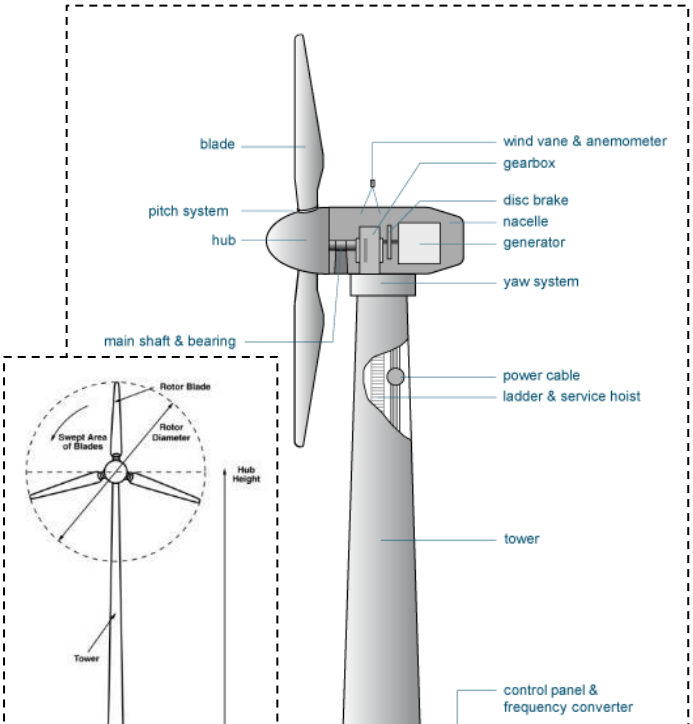


Figure 2-4: Illustrations of the main components of a typical wind turbine. *Note that the transformer would typically be inside the tower (probably at the base). Sources: www.newen.ca and www.soleai.com.

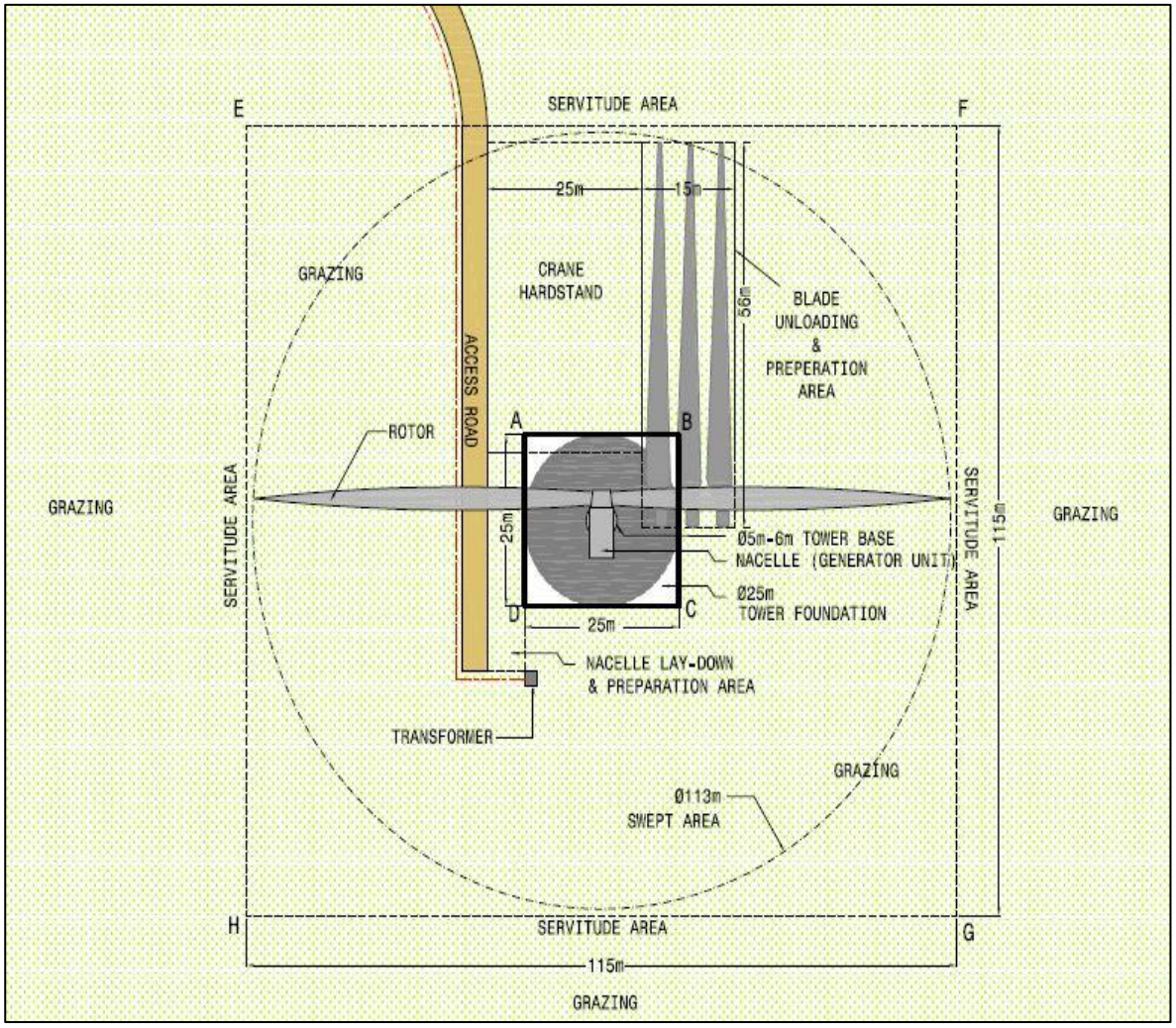


Figure 2-5: Typical construction phase platform

A platform of the dimensions indicated above needs to be laid down during the preliminary phase of a typical wind farm for access to the site during the construction phase by machines (bulldozers, trucks, cranes etc.).

Other works to be undertaken during the construction phase typically include:

aa) Geotechnical Studies and Foundation Works

A geotechnical study of the area is undertaken for safety purposes. This comprises of drilling, penetration and pressure assessments. For the purpose of the foundations, approximately 1500 m^3 of soil would need to be excavated for each turbine. These excavations are then filled with steel-reinforced concrete (typically 45 tons of steel reinforcement per turbine including a "bolt ring" to connect the turbine foundation to the turbine tower). Foundation design will vary according to the type and quality of the soil.

bb) Electrical Cabling

Electrical and communication cables are laid approximately 1 m deep in trenches which run alongside the access roads as much as possible. All previous farming activities can continue unhindered on the ground above the cables during the operational phase.

cc) Establishment of Hard Standing Surfaces and Laydown Areas

Laydown and storage areas will be required for the contractor's construction equipment and turbine components on site.

dd) Site Preparation

If not carried out in the preliminary works phase, this will include clearance of vegetation over the access roads, platforms, lay-bys, substation and any other laydown or hard-standing areas. These activities will require the stripping of topsoil which will be stock-piled, back-filled and/or spread on site.

ee) Establishment of Substation and Ancillary Infrastructure

The establishment of these facilities/buildings will require the clearing of vegetation and levelling of the development site and the excavation of foundations prior to construction. A laydown area for building materials and equipment associated with these buildings will also be required.

ff) Turbine Erection

Weather permitting; the erection of the turbines can be completed swiftly and erection rates generally average 1-2 turbines per week. This phase is the most complex and costly.

gg) Undertake Site Remediation

Once construction is completed and all construction equipment is removed, the site must be rehabilitated. On full commissioning of the facility, any access points to the site which are not required during the operational phase must be closed and rehabilitated.

hh) Electrical Connection

Each turbine is fitted with its own transformer that steps up the voltage usually to 22 or 33 kV. The entire wind farm is then connected to the "point of interconnection" which is the electrical boundary between the wind farm and the municipal or national grid. Most of these works will be carried out by Eskom or an Eskom-approved sub-contractor (line upgrade, connection to the sub-station, burial of the cables etc.)

C) OPERATIONAL PHASE

During the period when the turbines are up and running, on-site human activity drops to a minimum, and includes routine maintenance requiring only light vehicles to access the site. Only major breakdowns would necessitate the use of cranes and trucks.

D) FACILITY RE-POWERING

The wind turbines are expected to have a lifespan of approximately 25 years (with appropriate maintenance). The infrastructure would only be decommissioned once it has reached the end of its economic or technological life. If economically feasible, the disassembly and replacement of the individual components with more appropriate technology/infrastructure available at the time will take place.

E) DECOMMISSIONING OF THE WIND FARM

The infrastructure would only be decommissioned once it has reached the end of its economic or technological life. If economically feasible, the decommissioning activities would comprise the disassembly and replacement of the individual components with more appropriate technology/infrastructure available at the time. This operation is referred to as 'facility re-powering'. However, if not deemed so, then the facility would be completely decommissioned which would include the following decommissioning activities.

aa) Site preparation

Activities would include confirming the integrity of the access to the site to accommodate the required equipment and the mobilisation of decommissioning equipment.

bb) Disassemble all individual components

The components would be disassembled and reused and recycled or disposed of in accordance with regulatory requirements.

3 PROJECT NEED AND DESIRABILITY

The current section has taken note of the revised Guideline on Need and Desirability in terms of the *Environmental Impact Assessment (EIA) Regulations, 2014, DFFE Integrated Environmental Management Guidelines Series 9. 2017*.

When considering an application for EA, the competent authority must comply with section 24O of the NEMA (Act No. 107 of 1998), and must have regard for any guideline published in terms of section 24J of the Act and any minimum information requirements for the application. This includes this need and desirability guideline.

Additionally, the EIA Regulations require EAPs who undertake environmental assessments, to have knowledge and take into account relevant guidelines. A person applying for an EA must abide by the regulations, which are binding on the applicant.

The guideline contains information on best practice and how to meet the peremptory requirements prescribed by the legislation and sets out both the strategic and statutory context for the consideration of the need and desirability of a development involving any one of the NEMA listed activities. Need and desirability is based on the principle of sustainability, set out in the Constitution and in NEMA, and provided for in various policies and plans, including the National Development Plan 2030 (NDP). Addressing the need and desirability of a development is a way of ensuring sustainable development – in other words, that a development is ecologically sustainable and socially and economically justifiable – and ensuring the simultaneous achievement of the triple bottom-line.

The Guideline sets out a list of questions which should be addressed when considering need and desirability of a proposed development. These are divided into questions that relate to ecological sustainability and justifiable economic and social development. The questions that relate to ecological sustainability include how the development may impact ecosystems and biological diversity; pollution; and renewable and non-renewable resources. When considering how the development may affect or promote justifiable economic and social development, the relevant spatial plans must be considered, including Municipal IDPs, SDFs and Environmental Management Frameworks (EMFs). The assessment reports will need to provide information as to how the development will address the socio-economic impacts of the development, and whether any socio-economic impact resulting from the development impact on people's environmental rights. Considering the need and desirability of a development entails the balancing of these factors.

Sustainable development refers to the integrated relationship between social, economic and environmental factors in planning, implementation and decision-making so as to ensure that development serves present and future generations (National Sustainable Development Framework). Sustainable development is a programme to change the process of economic development so that it ensures a basic quality of life for all people and protects the ecosystems and community systems that make life possible and worthwhile.

3.1 CURRENT CONTEXT

Increasing pressure is being placed on countries internationally to reduce their reliance on fossil fuels, such as oil and coal, which contribute towards Greenhouse Gases (GHG) being emitted into the atmosphere and thus climate change. Renewable energy resources such as wind energy facilities and solar PV farms are being implemented as alternative sources of energy at a global and national scale.

South Africa has recognised the need to expand electricity generation capacity within the country. This is based on national policy and informed by ongoing planning undertaken by the Department of Mineral Resources and Energy (DMRE) and the National Energy Regulator of South Africa (NERSA).

The draft of the South African Integrated Resource Plan (IRP 2018) was released for public comment in August 2018, setting out a new direction in energy sector planning. The plan included a shift away from coal, increased adoption of renewables and gas, and an end to the expansion of nuclear power. The revised plan marks a major shift in energy policy. The draft policy aimed to decommission a total of 35 GW (of 42 GW currently operating) of coal generation capacity from Eskom by 2050, starting with 12 GW by 2030, 16 GW by 2040 and a further 7 GW by 2050.

The IRP 2019 was Gazetted in October 2019 and makes provision for the procurement of 1.6 GW of wind energy per annum from 2020 to 2030.

The implementation of the IRP constitutes significant progress in the transformation of the South African energy sector. To be in line with the Paris Agreement goals for mitigation, South Africa would still need to adopt more ambitious actions by 2050 such as expanding renewable energy capacity beyond 2030, fully phasing out coal by mid-century, and substantially limiting unabated natural gas use.

3.2 ELECTRICITY SUPPLY IN SOUTH AFRICA

South Africa's current electricity generation and supply system is unreliable. Eskom has a net output of 47,201MWp, and it produces 85% of South Africa's electricity, which is an equivalent of 40% of Africa's electricity. Renewable energy accounts for 7.3% of South Africa's electricity. This is mainly due to the targets set in the IRP2010-2030 that aimed to change the electricity landscape from high coal (91.7%) to medium coal (48%) using electricity produced by the Independent Power Producers (IPPs), with the utility company, Eskom, as the single buyer of the electricity. The Eastern Cape Province is reliant on the import of power from other provinces, and hence even more constrained by the availability and stability of electricity supply.

South Africa has a high level of renewable energy potential and presently has in place a target of 17 800 MW of renewable energy. The REIPPP Programme has been designed to contribute towards the national target and towards socio-economic and environmentally sustainable growth, and to start and stimulate the renewable industry in South Africa.

The DMRE launched the Request for Proposals (RFP) for the Sixth (6th) Bid Window under the REIPPPP in May 2022 with bids submitted on 3 October 2022. This procurement bid window is the second to be released in line with the Ministerial Determination, promulgated on 25 September 2020, which seeks to procure 11 813 MW of power from various sources including renewable energy, storage, gas, and coal.

Due to the ongoing electricity crisis facing South Africa, the RFP doubled the power output capacity in the initial bid announcement of May 2022, calling for proposals from IPPs to develop new generation capacity of 5 200 MW, including 3 200 MW from onshore wind energy and 2 000 MW from Solar Photovoltaic (Solar PV) power plants. No onshore wind was awarded during this bidding round due to Eskom constraints.

The 6th Bid Window was designed to address the ongoing electricity crisis facing South Africa, contribute towards socio-economic and environmentally sustainable growth, continue the successes of the REIPPPP since its inception, and further stimulate increased local participation and economic empowerment in the South African Renewable Energy industry. This round was concluded in May 2022 and future bid rounds are anticipated in the near future in South Africa.

3.3 SOCIAL AND ECONOMIC DEVELOPMENT

Ngxwabangu Wind Power intends to promote local economic growth and development through direct and indirect employment, as well as the identification and implementation of social development schemes during the project's operational phase. A local community trust will be established in order to ensure that funds are channelled to these social development schemes.

The need and desirability of the proposed Ngxwabangu WEF project can be demonstrated in the following main areas:

- Move to green energy due to growing concerns associated with climate change and the on-going exploitation of non-renewable resources;
- Security of electricity supply, where over the last few years, South Africa has been adversely impacted by interruptions in the supply of electricity, which has reached crisis levels. Prolonged stage 6 load shedding during 2022 has caused significant damage to the country's economy, with over R4 billion removed from the GDP for each day it continues (https://businesstech.co.za/news/business/627280/how-load-shedding-is-tearing-through-south-africas-economy/ Accessed 13 October 2022); and
- Stimulation of the green economy where there is a high potential for new business opportunities and job creation.

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

3.4 INTERNATIONAL

3.4.1 THE 1992 UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

The UNFCCC is a framework convention which was adopted at the 1992 Rio Earth Summit. South Africa signed the UNFCCC in 1993 and ratified it in August 1997. The stated purpose of the UNFCCC is to, "achieve… stabilisation of greenhouse gas concentrations in the atmosphere at concentrations at a level that would prevent dangerous anthropogenic interference with the climate system", and to thereby prevent human-induced climate change by reducing the production of greenhouse gases defined as, "those gaseous constituents of the atmosphere both natural and anthropogenic, that absorb and re-emit infrared radiation".

RELEVANCE TO THE PROPOSED NXAWABANGU WEF

The UNFCCC is relevant in that the proposed Ngxwabangu WEF project will contribute to a reduction in the production of greenhouse gases by providing an alternative to fossil fuel-derived electricity. South Africa has committed to reducing emissions to demonstrate its commitment to meeting international obligations.

3.4.2 THE KYOTO PROTOCOL (2002)

The Kyoto Protocol is a protocol to the UNFCCC which was initially adopted for use on the 11th of December 1997 in Kyoto, Japan, and which entered into force on the 16th of February 2005 (UNFCCC, 2009). The Kyoto Protocol is the chief instrument for tackling climate change. The major feature of the Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions. This amounts to an average of 5% against 1990 levels over the five-year period 2008-2011. The major distinction between the Protocol and the Convention is that, "while the Convention encouraged industrialised countries to stabilize GHG emissions, the Protocol commits them to do so".

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The Kyoto Protocol is relevant in that the proposed Ngxwabangu WEF project will contribute to a reduction in the production of greenhouse gases by providing an alternative to fossil fuel-derived electricity and will assist South Africa to begin demonstrating its commitment to meeting international obligations in terms of reducing its emissions.

3.5 NATIONAL

3.5.1 NATIONAL DEVELOPMENT PLAN (2011)

The National Development Plan (NDP) (also referred to as Vision 2030) is a detailed plan produced by the National Planning Commission in 2011 that is aimed at reducing and eliminating poverty in South Africa by 2030. The NDP represents a new approach by Government to promote sustainable and inclusive development in South Africa, promoting a decent standard of living for all, and includes twelve (12) key focus areas, those relevant to the current proposed WEF being:

- An economy that will create more jobs;
- Improving infrastructure; and
- Transition to a low carbon economy.

SECTOR	TARGET
Electrical infrastructure	➢ South Africa needs an additional 29,000 MW of electricity by 2030. About 10,900 MW of existing capacity will be retired, implying new build of about 40,000 MW. ➢ About 20,000 MW of this capacity should come from renewable sources.
Transition to a low carbon economy	➢ Achieve the peak, plateau and decline greenhouse gas emissions trajectory by 2025. ➢ About 20,000 MW of renewable energy capacity should be constructed by 2030.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF will contribute towards additional energy capacity in South Africa and will contribute towards a reduction in greenhouse gas emissions.

3.5.2 NATIONAL CLIMATE CHANGE RESPONSE WHITE PAPER (2012)

The White Paper indicates that Government regards climate change as one of the greatest threats to sustainable development in South Africa and commits the country to making a fair contribution to the global effort to achieve the stabilisation of greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system.

The White Paper also identifies various strategies in order to achieve its climate change response objectives, including:

- The prioritisation of mitigation interventions that significantly contribute to an eventual decline emission trajectory from 2036 onwards, in particular, interventions within the energy, transport and industrial sectors; and
- The prioritisation of mitigation interventions that have potential positive job creation, poverty alleviation and/or general economic impacts. In particular, interventions that stimulate new industrial activities and those that improve the efficiency and competitive advantage of existing business and industry.

The White Paper provides numerous specific actions for various Key Mitigation Sectors including renewable energy. The following selected strategies (amongst others) must be implemented by South Africa in order to achieve its climate change response objectives:

- The prioritisation of mitigation interventions that significantly contribute to a peak, plateau and decline emission trajectory where greenhouse gas emissions peak in 2020 to 2025 at 34% and 42% respectively below a business as usual baseline, plateau to 2035 and begin declining in absolute terms from 2036 onwards, in particular, interventions within the energy, transport and industrial sectors; and

- The prioritisation of mitigation interventions that have potential positive job creation, poverty alleviation and/or general economic impacts. In particular, interventions that stimulate new industrial activities and those that improve the efficiency and competitive advantage of existing business and industry.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF project will provide an alternative to fossil fuel-derived electricity and will contribute to climate change mitigation.

3.5.3 White Paper on Renewable Energy Policy (2003)

The White Paper on the Renewable Energy Policy (2003) commits the South African Government support for the development, demonstration and implementation of renewable energy sources for both small- and large-scale applications. It sets out the policy principles, goals and objectives to achieve, "An energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation".

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF is consistent with the White Paper and the objectives therein to develop an economy in which renewable energy has a significant market share and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation.

3.5.4 Integrated Energy Plan for the Republic of South Africa (2003)

The former Department of Minerals and Energy (DME) commissioned the Integrated Energy Plan (IEP) in response to the requirements of the National Energy Policy in order to provide a framework by which specific energy policies, development decisions and energy supply trade-offs could be made on a project-by-project basis. 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.

In addition to the above, the IEP recognised the following: -

- South Africa is likely to be reliant on coal for at least the next 20 years as the predominant source of energy;
- New electricity generation will remain predominantly coal based but with the potential for hydro, natural gas, renewables and nuclear capacity;
- Need to diversify energy supply through increased use of natural gas and new and renewable energies;
- The promotion of the use of energy efficiency management and technologies;
- The need to ensure environmental considerations in energy supply, transformation and end use;
- The promotion of universal access to clean and affordable energy, with the emphasis on household energy supply being coordinated with provincial and local integrated development programme;
- The need to introduce policy, legislation and regulations for the promotion of renewable energy and energy efficiency measures and mandatory provision of energy data; and
- The need to undertake integrated energy planning on an on-going basis.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The Ngxwabangu WEF is in line with the IEP with regards to diversification of energy supply and the promotion of universal access to clean energy.

3.5.5 Integrated Resource Plan for Electricity 2010-2030 (Revision 3, 2019)

The Integrated Resource Plan (IRP, 2019) for South Africa was initiated by the DMRE and lays the foundation for the country's energy mix up to 2030, and seeks to find an appropriate balance between the expectations of different stakeholders considering a number of key constraints and risks, including:

- Reducing carbon emissions;
- New technology uncertainties such as costs, operability and lead time to build;
- Water usage;
- Localisation and job creation;
- Southern African regional development and integration; and
- Security of supply.

The Integrated Resource Plan is an electricity infrastructure development plan based on the least-cost electricity supply and demand balance, taking into account security of supply and the environment through the minimisation of negative emission and water use. It is important because it is South Africa's plan for the procurement of generation capacity up to 2030. The last such plan was the Integrated Resource Plan 2010 (IRP 2010) promulgated in March 2011, and such plans are intended to be updated every two years.

Since the promulgation of IRP 2010, a total of 18 000 MW of new generation capacity has been committed comprising 9,564 MW of coal power at Medupi and Kusile, 1,332 MW of water pumped storage at Ingula, 6,422 MW of renewable energy by independent power producers (IPPs), and 1,005 MW of Open Cycle Gas Turbine (OCGT) peaking plants currently using diesel at Avon and Dedisa.

6,000 MW of new solar PV capacity and 14,400 MW of new wind power capacity will be commissioned by 2030 under IRP 2019. The current annual build limits on solar PV and wind have been retained pending a report on the just transition strategy. There will be no new concentrated solar power commissioned under IRP 2019 up to 2030 beyond the 300 MW already committed to being commissioned in 2019.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF is in line with the draft IRP 2019 with respect to the energy mix and movement to a low carbon economy up to 2030 and beyond.

3.5.6 Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

South Africa has a high level of renewable energy potential and presently has in place a target of 17 800 MW of renewable energy. The REIPPP Programme has been designed so as to contribute towards the national target and towards socio-economic and environmentally sustainable growth, and to start and stimulate the renewable industry in South Africa.

In terms of the REIPPPP, bidders are required to bid on tariff and the identified socio-economic development objectives of the DMRE. The tariff is payable by the Buyer (currently ESKOM) pursuant to the Power Purchase Agreement (PPA) to be entered into between the Buyer and the Project Company of a Preferred Bidder.

The Sixth (6^{th}) Bid Window under the REIPPPP had a BID submission deadline of 3 October 2022, included 56 bid submissions. This procurement bid window is the second to be released in line with the Ministerial Determination, promulgated on 25 September 2020, which seeks to procure 11 813 MW of power from various sources including renewable energy, storage, gas and coal.

The RFP called for proposals from IPPs to develop new generation capacity of 5 200 MW, including 3 200 MW from onshore wind energy and 2 000 MW from Solar Photovoltaic (Solar PV) power plants.

This 6th Bid Window was designed to contribute towards socio-economic and environmentally sustainable growth, to continue the successes of the REIPPPP since its inception, and to further stimulate increased local participation and economic empowerment in the South African Renewable Energy industry.
Given the energy challenges the country is facing the qualification criteria has been developed to promote the participation of projects that are fully developed and will be able to be constructed and connected to the national grid as soon as possible, but not later than 24 months post Commercial Close.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

In terms of REIPPPP, bids would be awarded for renewable energy supply to Eskom through up to 7 bidding phases and additional phases in the years to come. The 1st, 2nd, 3rd, 4th, 5th and 6th round bidding processes have been completed where projects are currently reaching financial close in order to implement the projects. REIPPPP is currently expected to move into the 7th bidding window in 2023.

3.5.7 Long Term Mitigation Scenarios (2007)

The aim of the Long-Term Mitigation Scenarios (LTMS) was to set the pathway for South Africa's long-term climate policy and will eventually inform a legislative, regulatory and fiscal package that will give effect to the policy package at a mandatory level. The overall goal is to "develop a plan of action which is economically risk-averse and internationally aligned to the world effort on climate change."

The strategy assesses various response scenarios but concludes that the only sustainable option ("the preferred option") for South Africa is the "Required by Science" scenario where the emissions reduction targets should target a band of between -30% to -40% emission reductions from 2003 levels by 2050 which includes increasing renewable energy in the energy mix by 50% by 2050.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF will contribute towards an overall reduction in emissions and aligns with the world stance on efforts towards the mitigation of climate change.

3.5.8 Industrial Policy Action Plan 2011/12 – 2013/14

The South African Industrial Policy Action Plan (IPAP 2) 2011/12 – 2013/14 represents a further step in the evolution of this work and serves as an integral component of government's New Growth Path and notes that there are significant opportunities to develop new 'green' and energy-efficient industries and related services; and indicates that in 2007/2008, the global market value of the 'Low-Carbon Green Sector' was estimated at £3 trillion (or nearly US$5 trillion), a figure that is expected to rise significantly in the light of climate-change imperatives, energy and water security imperatives.

Based on economic, social and ecological criteria, IPAP identified a number of sub-sectors and an initial round of concrete measures were proposed for development of the renewable energy sector with the following key action programmes:

- Solar and Wind Energy - Stimulate demand to create significant investment in renewable energy supply and the manufacturing of local content for this supply.
- Green Industries special focus: The South African Renewables Initiative (SARi) - SARi is an intra-governmental initiative set to catalyse industrial and economic benefits from an ambitious program of renewables development; including financing and associated institutional arrangements that would not impose an unacceptable burden on South Africa's economy, public finances or citizens.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF will contribute towards an overall reduction in emissions, and it aligns with the world stance on efforts towards the mitigation of climate change.

3.5.9 Strategic Infrastructure Projects (2012)

The National Infrastructure Plan that was adopted in 2012 together with the New Growth Path, which sets a goal of five million new jobs by 2020, identifies structural problems in the economy and points to opportunities in specific sectors and markets or "jobs drivers" resulted in the establishment of the Presidential Infrastructure Coordinating Committee (PICC) which in turn resulted in the development of 18 Strategic Infrastructure Projects (SIPS).

SIPS relevant to renewable energy include:

SIP 8: Green energy in support of the South African economy

- Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP2010).

SIP 9: Electricity generation to support socio-economic development

- Accelerate the construction of new electricity generation capacity in accordance with the IRP2010 to meet the needs of the economy and address historical imbalances.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The Ngxwabangu WEF will contribute to SIP project role out, should it be bid and awarded preferred bidder status in a future bidding round.

3.6 Provincial

3.6.1 Eastern Cape Provincial Development Plan (2014)

The Eastern Cape Provincial Development Plan 2014 (Eastern Cape Vision 2030) is a strategic policy which has been designed to identify strategic goals for implementation in the province. There are five goals, one of which will be expanded in detail as it relates to the growth of the economy, from a renewable energy perspective.

As per the EC PDP the following goals encompass the 2030 vision.

1. Goal 1: A growing, inclusive and equitable economy – "The Eastern Cape has a growing, inclusive and equitable economy, which is larger and more efficient, and optimally exploits the competitive advantages of the province, increases employment, and reduces inequalities of income and wealth. This vision will be realised addressing the key constraints to unlocking economic potential: production costs, economic development support, infrastructure, workforce issues, and land and water challenges."
   The focus will be on seven high-potential sectors:
   i. Agriculture
   ii. Mining and energy
   iii. Construction related to large infrastructure, new property developments and the upgrading of human settlements.
   iv. Manufacturing
   v. Tourism, including eco-tourism, heritage, conferences and sports.
   vi. The social economy, including public works and asset-based community development.
   vii. Knowledge-based services, including R&D, professional services and business services
   The economic goal will be achieved through five strategic objectives:
   i. Improved economic infrastructure that promotes new economic activity
   ii. Stronger industry and enterprise support
   iii. An accelerated and completed land-reform process
   iv. Rapid development of high-potential economic sectors
2. Rapid economic development of rural areas and all regions.
   Goal 2: An educated, empowered and innovative citizenry

3. Goal 3: A healthy population
4. Goal 4: Vibrant, equitably enabled communities
5. Goal 5: Capable, conscientious and accountable institutions

The following strategic objectives form part of the EC PDP 2030 Vision. These strategic objectives have been copied verbatim from the PDP. All those which are relevant to the proposed development area have been highlighted and discussed. Those which are not relevant are not expanded on.

1. Strategic objective 1.1: Improved economic infrastructure that promotes new economic activity

Strategic action 1.1.1: Develop stronger provincial infrastructure planning capacities

Infrastructure planning is a complex process, involving large long-term investments, projected benefits that are difficult to quantify, and a combination of engineering and economic thinking. While the theory of allocating available capital among alternative infrastructure projects is straightforward (select projects with the highest socioeconomic return on investment using a standardised methodology), the practice is much more difficult. The province needs to build infrastructure planning capacity to ensure the following:

- *New infrastructure investments are aligned with the provincial development agenda.*
- *New investments optimise potential economic benefits, encouraging new private-sector investment, increasing local content supply and creating local jobs.*
- *New investments are responsive to changing economic circumstances.*
- *Investments contribute to equitable development – all regions of the province must benefit from the infrastructure programme (see strategic objective 5 for more on this point).*
- *Infrastructure planning and delivery by state-owned entities and others around water, energy, logistics and ICT need to be integrated because different types of infrastructure are usually required jointly.*
- *More capacitated infrastructure planning is required to present convincing arguments to potential investors and to enable effective lobbying.*

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF is in line with the Chris Hani renewable energy goals. It also comprises new infrastructure investment for the Eastern Cape province as a whole. In addition to this, the REIPPPP process includes stringent socioeconomic goals for which the WEF developer will be responsible if the proposed project is successful. In terms of equitable investment across the province, the proposed renewable energy development will benefit the provincial energy supply by supplying up to 260 MW of electricity to the Eskom Grid.

Strategic action 1.1.2: Work with the Presidential Infrastructure Coordinating Committee to plan and implement improved infrastructure

The Presidential Infrastructure Coordinating Committee has done considerable work on the National Infrastructure Plan. A summary of this plan in the province is presented in Annexure E.

We support much of what the Presidential Infrastructure Coordinating Committee is planning for the province. Large elements of the plan in the Eastern Cape are unfunded and preliminary; therefore the province will work with the Presidential Infrastructure Coordinating Committee to ensure that the National Infrastructure Plan responds fully to development priorities.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF is in line with the National Infrastructure Plan which aims to improve energy supply across the whole of South Africa. One of the regions earmarked for wind development is the Chris Hani district of the Eastern Cape province.

Strategic action 1.1.3: Improve maintenance of existing infrastructure

Infrastructure in the province is generally poorly maintained, reducing the value of infrastructure assets. Responsible public bodies should correct this by making the necessary budgetary adjustments. Increased maintenance activity would also contribute to increased employment, as infrastructure maintenance is employment-intensive.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF would contribute towards both road and electrical/substation maintenance of existing infrastructure surrounding the WEF site.

Strategic action 1.1.4: A major new provincial irrigation programme
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.1.5: Investment in strategic freight and passenger corridors
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.1.6: Position the province as a key investment hub in the energy sector and ensure reliable energy supply to high-potential sectors.
The province is positioning itself as an investment hub in the energy sector (wind farms, imported liquefied natural gas, shale-gas and nuclear energy). This will provide opportunities to develop the capital goods sector and heavy industries. This new investment could become a major catalyst for provincial economic development, particularly if the benefits and costs are well managed. Regional and local benefits accruing from new investment in the energy sector could include:

- *Cheaper energy (fuel and electricity), leading to cheaper food and transport, and more competitive labour markets.*
- *Employment in the construction, operation and maintenance of new energy facilities.*
- *Employment in the supply of manufactured components for the new energy facilities.*
- *Downstream linkages (for example, in the petro-chemicals industry based on shale gas).*
- *New rental collection systems to capture a portion of the surplus from these new investments.*

The province will need to position itself very carefully to ensure that these regional and local benefits are maximised, and costs (including externalities) are minimised.

Approved wind energy projects already account for 63 percent of the average provincial energy demand (1 700 megawatts [MW]). There are serious institutional hindrances to wind-farm developments (a reported 35 permits are required), particularly in the former homelands where there are land-tenure issues. Pre-authorisation arrangements in "renewable energy zones" (to be located in Cacadu and Chris Hani districts) will allow this industry to expand to its full potential (500MW).

In addition, municipalities need to improve their maintenance and upgrading of electricity distribution, and review their mark-ups on electricity prices. This work should be spearheaded by the Department of Economic Development, Environmental Affairs and Tourism.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF is in line with the Eastern Cape Vision 2030 Provincial Development Plan, specifically Strategic Action 1.1.6, as it entails the development of a wind farm which could potentially contribute up to 260 MW of electricity to the Eskom Grid. As stated in the PDP, the DEDEAT must carefully review each strategic position of WEFs are proposed to ensure that they align with the provincial plan.

Strategic action 1.1.7: Universal and affordable broadband access
This strategic action would not be impeded by the proposed WEF.

2. Strategic objective 1.2: Rapid economic development of rural areas and all regions

Strategic action 1.2.1: All regions to develop and implement regional development strategies
Different development approaches are required for different regions of the province. As previously noted, the former Bantustans, where the majority of the province's people live, have extremely low levels of economic production and high poverty rates.

Each region has significant economic potential. For example:

- *The Nelson Mandela Bay/Cacadu region has energy potential (fracking, nuclear, wind), knowledge services, industrial manufacturing (Coega, smelters, petro-chemicals), agribusiness, tourism/property developments. It has potential as a primary trading hub, with Jeffreys Bay as a growth node.*
- *The Buffalo City Municipality/Amathole region has potential as a secondary export hub in agribusiness, knowledge services, light manufacturing, tourism and property/small-town development. Gcuwa and Alice are growth nodes.*
- *OR Tambo is expected to grow to become the province's third economic centre, with King Sabata Dalindyebo Municipality working towards metro status, based on ICT/knowledge services, logistics, agribusiness, tourism and property/small-town development. Port St Johns is a growth node.*
- *Chris Hani could become an agricultural region, with Sakhisizwe, Engcobo and Emalahleni as agriculture growth nodes.*
- *Alfred Nzo and Joe Gqabi regions could follow the provincial growth path, with stronger local state capacities contributing to increased economic opportunities. Sterkspruit, Burgersdorp and Mbizana are growth nodes.*

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The Ngxwabangu WEF is proposed in the Chris Hani DM. This aligns with the plan proposed in strategic objective 1.2.1. Agriculture is also listed as having significant economic potential in the district. Suitable areas, which do impede on future growth of both industries must be earmarked as suitable. The PDP is clear that both streams of economic development are vital for the economic growth of the Eastern Cape Province.

Strategic action 1.2.2: Increase rural economic production, particularly in the former Bantustans
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.2.3: Use infrastructure investment to promote more equitable regional Development
New infrastructure investment is crucial for shaping regional development. Each of the eight regions has at least one mega-project in the pipeline:

- *Nelson Mandela Bay: Port Elizabeth Waterfront; manganese channel; transhipment hub*
- *Cacadu: Nuclear plant; wind farms*
- *Buffalo City Municipality: East London sleeper site; airport to N2 road*
- *Amathole: Wild Coast Meander; irrigation schemes (Kat River and so on)*
- *OR Tambo: Mzimvubu project; N2 highway; Wild Coast Meander*
- *Alfred Nzo: N2 highway*
- *Chris Hani: Irrigation schemes (rehabilitation, extension and new projects)*
- *Joe Gqabi: Boskraai Dam/Orange River mega-project*

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The Ngxwabangu WEF is proposed in the Chris Hani DM. The economic investment in the area could contribute towards the strategic growth of the district through agricultural schemes. Please refer to the SEIA for more information.

3. Strategic objective 1.3: Stronger industry and enterprise support

Strategic action 1.3.1: Create partnerships to drive economic development
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.3.2: Improve use of public resources for industry and enterprise support
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.3.3: Increase public resources for industry and enterprise support
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.3.4: Support micro, small, medium and large-scale enterprises

This strategic action would not be impeded by the proposed WEF.

Strategic action 1.3.5: Ensure supply of skills to growth sectors
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.3.6: Support R&D and innovation initiatives
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.3.7: Develop new policy instruments
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.3.8: Improve capacity for economic policy analysis
This strategic action would not be impeded by the proposed WEF.

4. Strategic objective 1.4: Accelerate and complete the land-reform process

Strategic action 1.4.1: Design, implement and complete a new land redistribution plan
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.4.2: Address communal land tenure reform
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.4.3: Finalise restitution process
This strategic action would not be impeded by the proposed WEF.

5. Strategic objective 1.5: Rapid development of high-potential economic sectors
The PDP's diagnostic process identified seven economic sectors with strong development potential. The table below summarises the suggested high-level sector strategies:

SECTOR	SUGGESTED STRATEGIES
Agriculture	*Address land ownership and water issues to enable rapid capital accumulation (multi-scale and complete value chains). Focus on irrigation opportunities and value addition.*
Mining and Energy	*Optimise benefits from Karoo shale-gas, including feedstock for provincial petrochemicals, and position the Province as an energy hub*
Construction	*Ensure present infrastructure pipeline is properly planned, resourced and implemented; create enabling conditions for property development and build skills base.*
Manufacturing	*Exploit coastal competitive advantages and realise potential of industrial development zones/special economic zones; create multi-agency partnerships to drive industrial expansion and diversification*
Tourism	*Use competitive advantages to grow volume and value of eco-tourism, heritage and sports tourism; improve access infrastructure and build stronger local tourism networks*
Social Economy	*Transform public works (EPWP/CWP) into a major platform for sustainable enterprise development (asset-based community development)*
Knowledge-based Services	*Increase quantity and quality of skills formation; form multi-agency partnerships around strategic R&D and deepen ICT access and usage*

Strategic action 1.5.1: Grow and develop the agriculture sector
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.5.2: Grow and develop the mining sector
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.5.3: Grow and develop the construction industry
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.5.4: Grow and develop manufacturing industry
Nine identified manufacturing industries have potential for expansion. These should be examined in light of the Industrial Policy Action Plan with a view to multi-agency partnership formation. The nine industries are:

- *Maritime – connected to the province's three ports (ship repairs)*
- *Pharmaceutical – Aspen in Port Elizabeth employs 2 500 people*
- *Green/renewables – based on the existing pipeline of new wind-farms*
- *Agro-processing – based on increasing primary production*
- *Materials – products for the future through innovative R&D projects*
- *Light manufacturing – based on specialised clothing and footwear enterprises*
- *Automotive – increase manufacturing depth (first- and second-tier)*
- *Petro-chemicals – based on Karoo shale-gas and offshore resources*
- *Capital goods – based on investment plans of state-owned enterprises and heavy industry at Coega.*

Possible interventions include:

- *Improving regional competitiveness (logistics, skills, energy, R&D).*
- *Reviewing the Provincial Industrial Development Strategy (2009).*
- *Retaining and expanding the automotive industry, ensuring the auto cluster arrangement works effectively.*
- *Ensuring proper support for the growth of existing industrial development zones; expanding these zones to include other industrial areas in the metros; designing and implementing new agroindustrial special economic zones; and piloting a new rural industries programme.*
- *Reviving old labour-intensive industries, such as clothing and footwear.*
- *Promoting new-wave industries (green and maritime).*
- *Strengthening industrial cluster/multi-agency partnership initiatives.*
- *Ensuring the province's industrial development is environmentally sustainable and building industrial recycling enterprises (for example, platinum recycling).*

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The Ngxwabangu WEF is proposed in the Chris Hani DM. This aligns with the plan proposed in strategic objective 1.5.4. for growth in the provincial manufacturing industry. The proposed Ngxwabangu WEF would be considered a new wind farm infrastructure development within the district.

Strategic action 1.5.5: Grow and develop the tourism industry
The tourism industry has high potential for growth, based on eco-tourism, heritage tourism, conferencing and sports tourism. The provincial tourism economy grew rapidly after 1994 until the global recession in 2009. Tourism investment accounts for about 10 percent of annual fixed investment and most of this is in the two metros. It is estimated that 70 percent of provincial tourism economy is in the coastal zone. Six of the Eastern Cape's eight districts/metros have coastal access. Top attractions for international tourists are game reserves (58 percent), beaches (52 percent), tree-top canopy tours in Tsitsikamma (16 percent) and the Nelson Mandela Museum in Mthatha (10 percent). International tourism spending is 40 percent greater than domestic tourism spending.

Strategic interventions include:

- *Ensuring stronger support for heritage (including newly discovered archaeology sites of early humans) and sports tourism.*
- *Expediting the Eastern Cape Parks and Tourism Agency's commercialisation of provincial nature reserves.*
- *Unlocking Wild Coast tourism potential (the Wild Coast Meander) and addressing tenure issues for new investment in tourism facilities.*
- *Protecting the Wild Coast (and other sensitive areas) from environmental degradation.*
- *Improving tourist access (Port Elizabeth international airport).*

- *Focusing on the development of domestic tourism, particularly budget beach holidays (near Port Elizabeth and East London).*
- *Upgrading inner-city environments, beachfronts and associated tourism attractions in Port Elizabeth and East London, and throughout the province, including the Wild Coast.*
  Investigating the development of marina and waterfront developments at Port Elizabeth, East London and Port St Johns.
- *Electronic marketing of the province's unique combination: nature, beaches and state subsidisation of high-potential tourism geographic clusters (marketing).*

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF could revive existing tourism potential in the area through economic development schemes. Please refer to the SEIA for more information.

Strategic action 1.5.6: Grow and develop the social economy
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.5.7: Grow and develop knowledge-based services
This strategic action would not be impeded by the proposed WEF.

Strategic action 1.5.8: Grow and develop the ocean economy
This strategic action would not be impeded by the proposed WEF.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF is in line with the Eastern Cape Vision 2030 Provincial Development Plan, potential conflicts can be managed at a local spatial level.

3.6.2 EASTERN CAPE CLIMATE CHANGE STRATEGY (2011)

According to the Eastern Cape Climate Change Response Strategy, wind energy was the fastest growing energy technology sector, which accounted for more than 50% of worldwide clean energy investment, in 2009 as well as almost half of the installed clean energy capacity worldwide. The South African Wind Energy Association called for 25% of the overall electricity generation mix by 2025 to be derived from renewable energy, with 80% of this target potentially coming from wind power.

The Eastern Cape Climate Change Response Strategy developed a set of pragmatic GHG mitigation programmes. These consisted of the following mitigation categories:

- Mainstreaming GHG mitigation in provincial and local government and in industry
  - Mainstreaming GHG mitigation in decision-making at all levels of government within the Eastern Cape Province;
  - Promoting GHG mitigation in provincial and local government operations; and
  - Promoting GHG reporting in industry.
- Promotion of renewable energy in the Eastern Cape
  - Create an enabling environment for investment in, implementation and use of clean energy in the Eastern Cape.
- Mitigation and opportunities for rural livelihoods
  - Facilitate integrated lead projects that promote sustainable livelihoods and local economic development while achieving (tradable) emission reductions.
- Mitigation in solid waste and wastewater treatment
  - Reduction in organic waste to landfill, renewable energy from waste, and methane use or destruction.
- Greenhouse gas mitigation in transport
  - Facilitate shift to low GHG modes of transport and transport systems.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF supports the Eastern Cape Climate Change Response Strategy as it is in line with the mitigation measures that have been developed in an effort to reduce GHG emissions.

3.6.3 EASTERN CAPE SUSTAINABLE ENERGY STRATEGY (2012)

The Eastern Cape Sustainable Energy Strategy identifies six (6) goals which will assist in achieving the Province's vision, "The Eastern Cape provides the most enabling environment for sustainable energy investment and implementation in the country", and these goals include:

- Goal 1: Job creation and skills development
- Goal 2: Alleviate energy poverty
- Goal 3: Alleviate CO_2 emissions and environmental pollution
- Goal 4: Improve industrial competitiveness
- Goal 5: Promote renewable energy production in the Province
- Goal 6: Promote the development of a renewable energy manufacturing industry and technology development

In addition, Section 6.2.2: Future Supply Options for the Eastern Cape of the Eastern Cape Sustainable Energy Strategy states that *"60 wind farms with a combined capacity of about 4 253 MW have applied to Eskom for connection quotations in the Province (as at March 2012); this is the most promising short- and medium-term source of locally generated energy for the Eastern Cape."*

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF could potentially contribute, directly and/or indirectly, to all six (6) sustainable energy goals as stipulated in the Eastern Cape Sustainable Energy Strategy.

3.6.4 CHRIS HANI DISTRICT MUNICIPALITY INTEGRATED DEVELOPMENT PLAN

The CHDM IDP (2022/2027) states that the municipality is mainly a rural district that strives to achieve the Pillars of Vision 2030 as follows:

- Economically Self-Sustained Rural Villages
- Infrastructure development linked to Economic Growth opportunities
- Transformed Land Use and Ownership
- Revived Small Towns & Wall- Wall Planning
- Effective and Efficient Municipalities
- Active and Able Citizenry
- Entrepreneurial and Skills Development linked to key sectors
- Revitalised Industries

To meet the Chris Hani District Developmental agenda/5 priority areas, energy security within the District needs to be addressed, and infrastructure linked to economic growth opportunities needs to be developed. Renewable Energy forms an important component of the economic growth opportunities of the municipality. The District has 14 working renewable energy locations and 39 proposed renewable energy locations. There are a total of 10 existing and proposed Wind Energy Sites, 11 existing and proposed Solar Energy Sites, with the technology of the remaining proposed sites not been classified yet.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF is in line with the Chris Hani IDP in that the SWOT analysis undertaken identified solar and wind farms as potential opportunities.

3.6.5 Intsika Yethu Local Municipality Integrated Development Plan

The Intsika Yethu LM IDP (2022/2027) recognizes the opportunity presented by the REDZ which falls within a portion of the municipality. The Stormberg REDZ falls within the northern and central portions of the municipality. The development of renewable energy facilities will have positive impacts for the local population. This would be as a result of the construction and operation of these facilities and the social responsibilities that the operators of the facilities have. This will result in socio-economic benefits in the area.

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF would contribute to the identified economic development within the LM and is in line with the development trajectory as described within the IDP.

3.7 Site Selection: Wind Capability

In order to determine the wind resource potential of a proposed WEF site, it is necessary to erect a wind measurement mast to gather wind speed data and correlate these measurements with other meteorological data. A measurement campaign of at least 12 months in duration is necessary to ensure verifiable data is obtained. This data has advised on the economics of the project and will be used to finalise the positions of the wind turbines. The masts were marked as per the requirements of the Civil Aviation Authority (CAA).

3.8 Renewable Energy Development Zones

On the 17th of February 2016, the Cabinet of the Republic of South Africa (Cabinet) approved the gazetting of REDZs.

REDZs refer to geographical areas where wind and solar PV development can occur in concentrated zones, which will lead to:

- a reduction of negative environmental consequences;
- alignment of authorisation and approval processes;
- attractive incentives; and
- focused expansion of the South African electricity grid.

Cabinet further stated that the REDZs will, among others, accelerate infrastructure development and contribute to creating a “predictable regulatory framework that reduces bureaucracy related to the cost of compliance”.

The DFFE’s media statement issued in respect of the approved gazetting of the REDZs provided that 8 REDZs (Phase 1), 3 additional REDZ (Phase 2) and 5 Power Corridors have been identified. The REDZs are located in Overberg (Western Cape), Komsberg (Western Cape), Cookhouse (Eastern Cape), Stormberg (Eastern Cape), Kimberley (Free State/Northern Cape), Vryburg (North West), Upington (Northern Cape) and Springbok (Northern Cape). The 5 Power Corridors are as follows: The central corridor runs for the first time from the south of the country to the north. Two corridors run along the east and west coasts (these two corridors were recently expanded), while the fourth and fifth include interconnections with Botswana, Namibia and Zimbabwe to accommodate current and forecasted imports and exports of electricity. Eskom estimates that the thousands of kilometres of transmission lines and infrastructure needed to create these corridors of power will take eight years to construct and cost approximately R213bn. The REDZs and Power Corridors support 2 of the 18 Strategic Integrated Projects (SIPs), which were identified in the Infrastructure Development Plan which is aimed at promoting catalytic infrastructure development to stimulate economic growth and job creation. The proposed Ngxwabangu WEF falls within REDZ 4 (Stormberg), as well as a Strategic Transmission Corridor (Eastern Corridor).

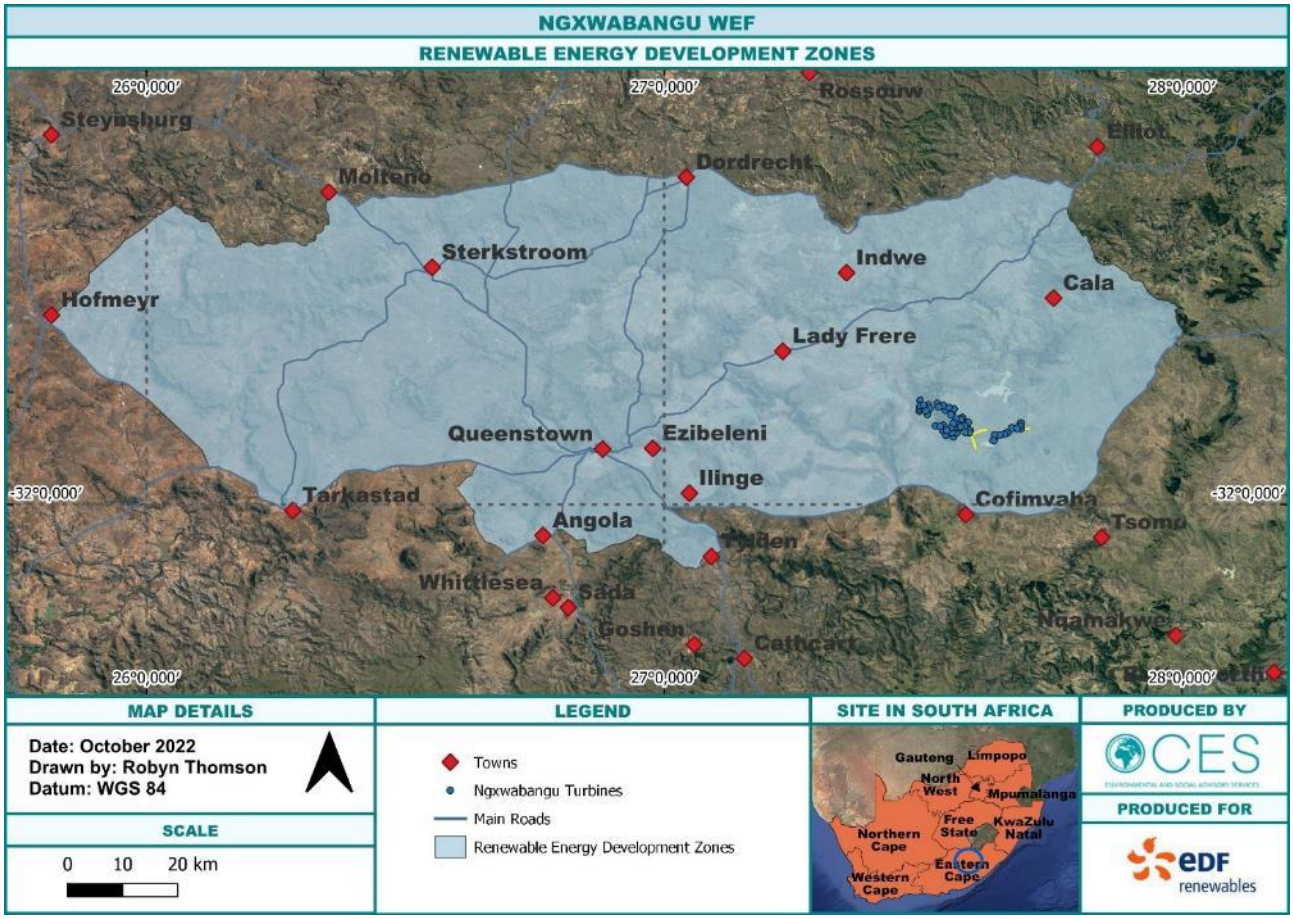


Figure 3-1: Ngxwabangu WEF within REDZ 4 (Stormberg)

RELEVANCE TO THE PROPOSED NGXWABANGU WEF

The proposed Ngxwabangu WEF occurs within the Stormberg REDZ area and is situated within the eastern transmission corridor.

3.9 Biodiversity Conservation Programmes

The proposed Ngxwabangu WEF occurs within or is within close proximity to various important conservation areas as described below.

3.9.1 National Vegetation Map (SANBI)

As indicated in the baseline ecological assessment in Section 5 of this BAR, according to SANBI's National Vegetation Map (2018), the proposed WEF infrastructure occurs within two (2) of the three (3) regional vegetation types, namely Drakensberg Foothills Moist Grassland (least concern) and Tsomo Grassland (least concern) (Figure 3-2).

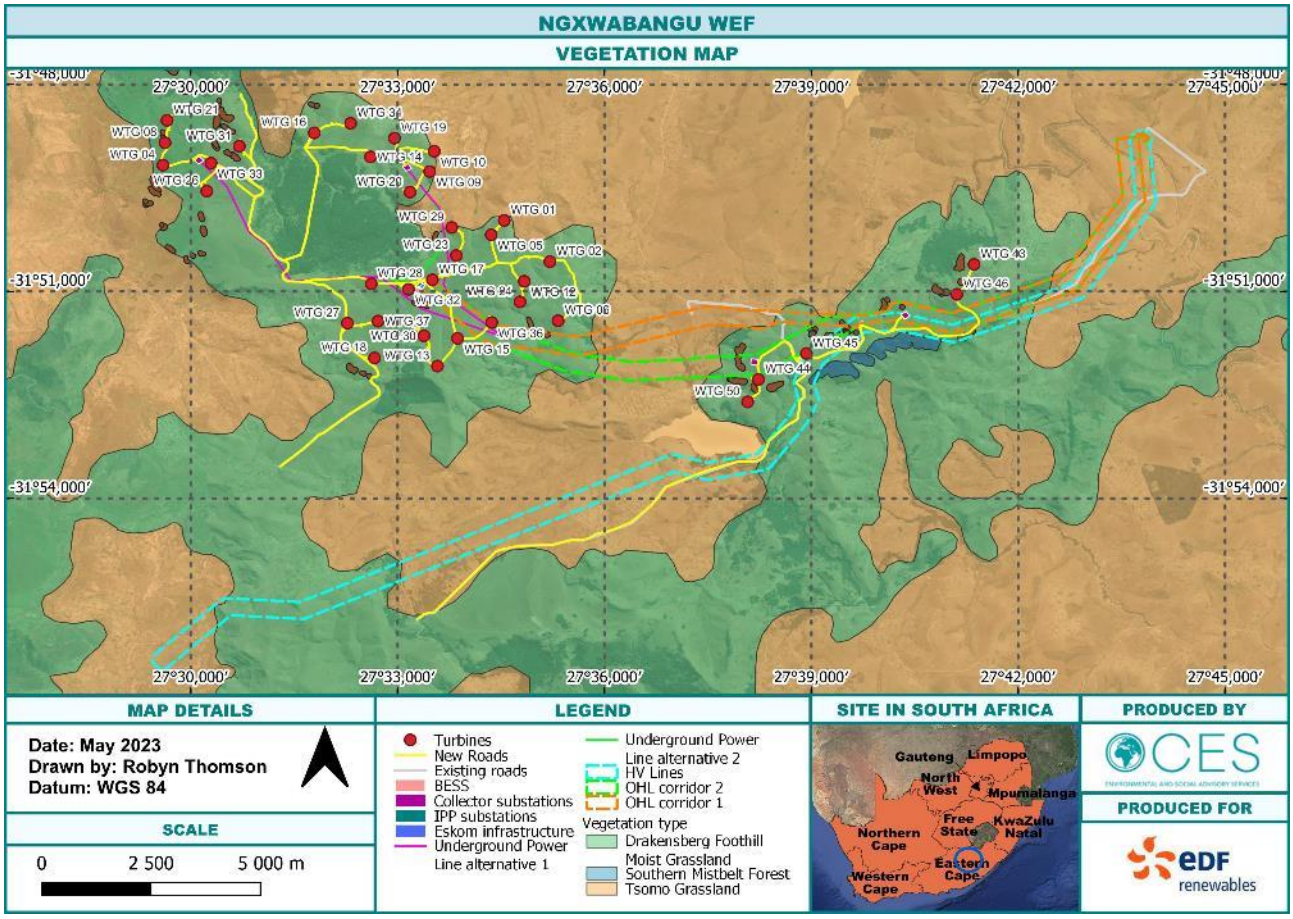


Figure 3-2: Ngxwabangu WEF Vegetation Map

3.9.2 Critical Biodiversity Areas (ECBCP)

The Ngxwabangu WEF site is situated within Terrestrial CBA 1, CBA 2, ESA 1 and ESA 2 areas (Figure 3-3). It is also situated within an Aquatic ESA 1 (Figure 3-4). It is likely that development within the CBA cannot be avoided. This is discussed in more detail in Chapter 5 of this report. Please also see the Ecological Impact Assessment, Appendix D, and the Biodiversity Offset Strategy, Appendix E.

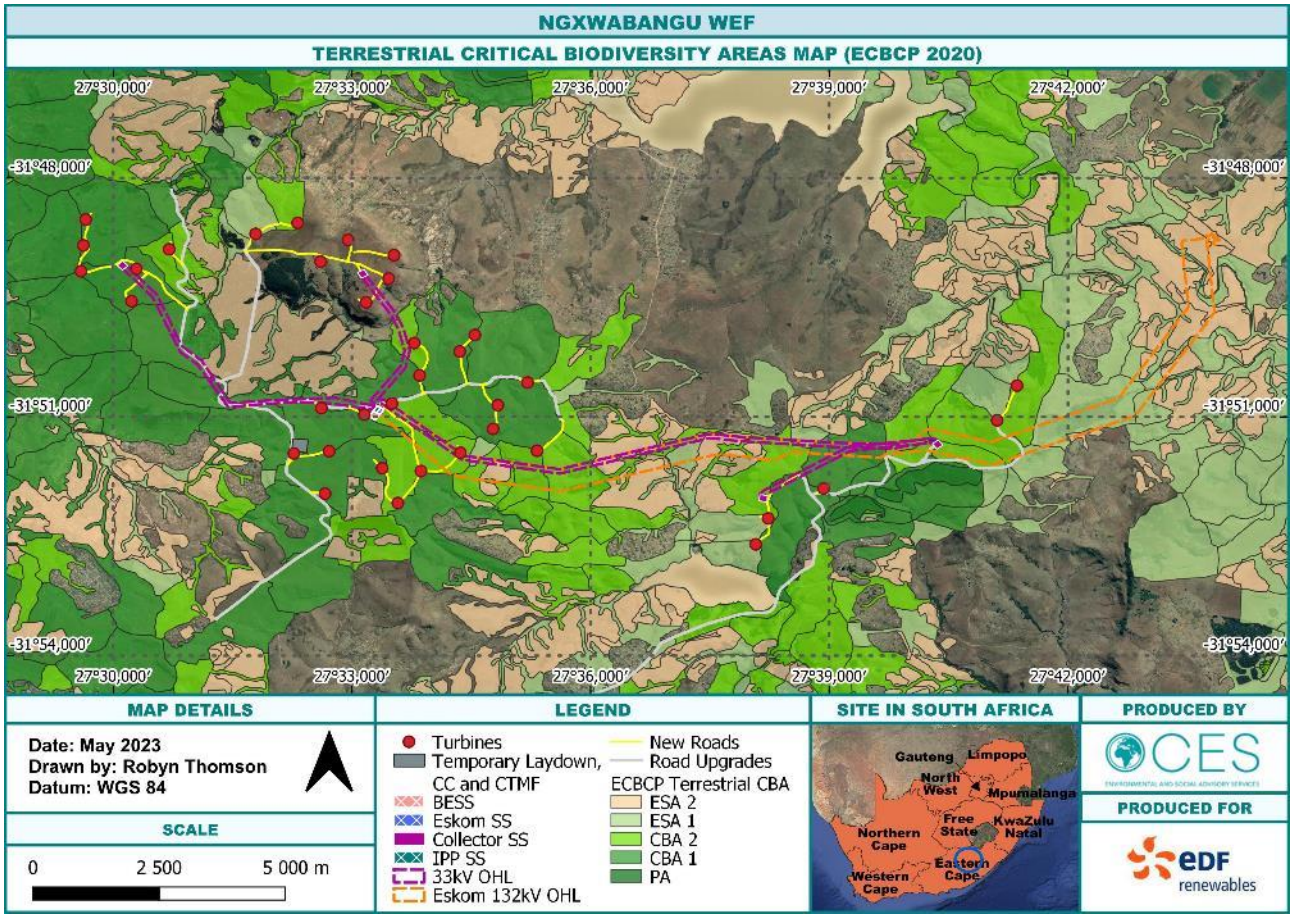


Figure 3-3: Ngxwabangu WEF Terrestrial CBA Map

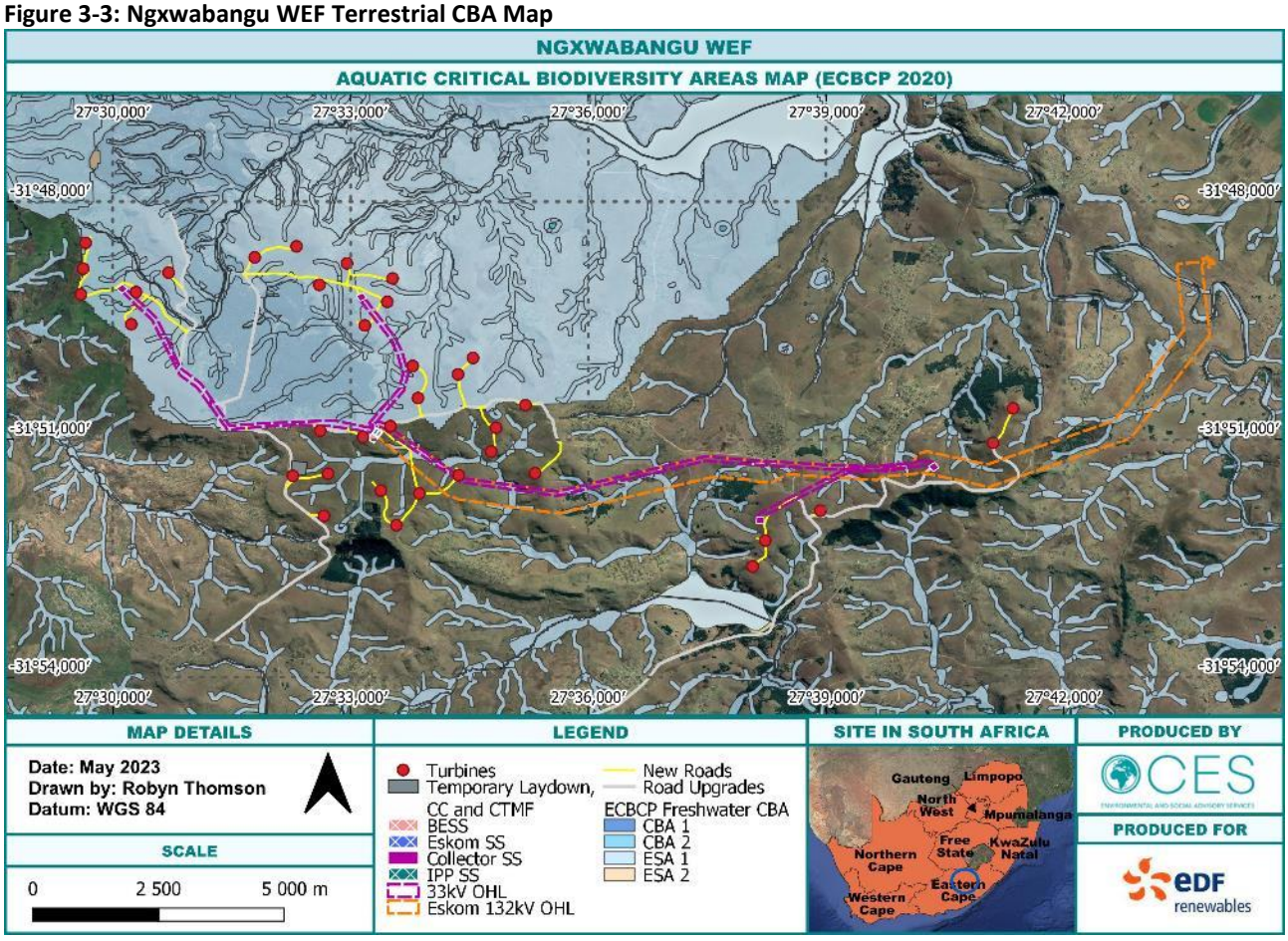


Figure 3-4: Ngxwabangu WEF Aquatic CBA Map

3.9.3 PROTECTED AREAS

No protected areas are located on the proposed WEF site (Figure 3-5). The closest protected area is the Longhill Nature reserve, located approximately 50 km to the west. The Cathcart Nature Reserve is located 60 km to the southwest and the Andriesbergen Private Nature Reserved 66 km to the northwest of the WEF.

Areas on the western side of the WEF, have been identified by the National Protected Areas Expansion Strategy (NPAES) (2010/11) as a Priority Focus Area. However, none of the Focus Areas in the updated NPAES (2018) traverse the site. There are no provincially legislated Protected Areas occurring within the study area (Figure 3-5).

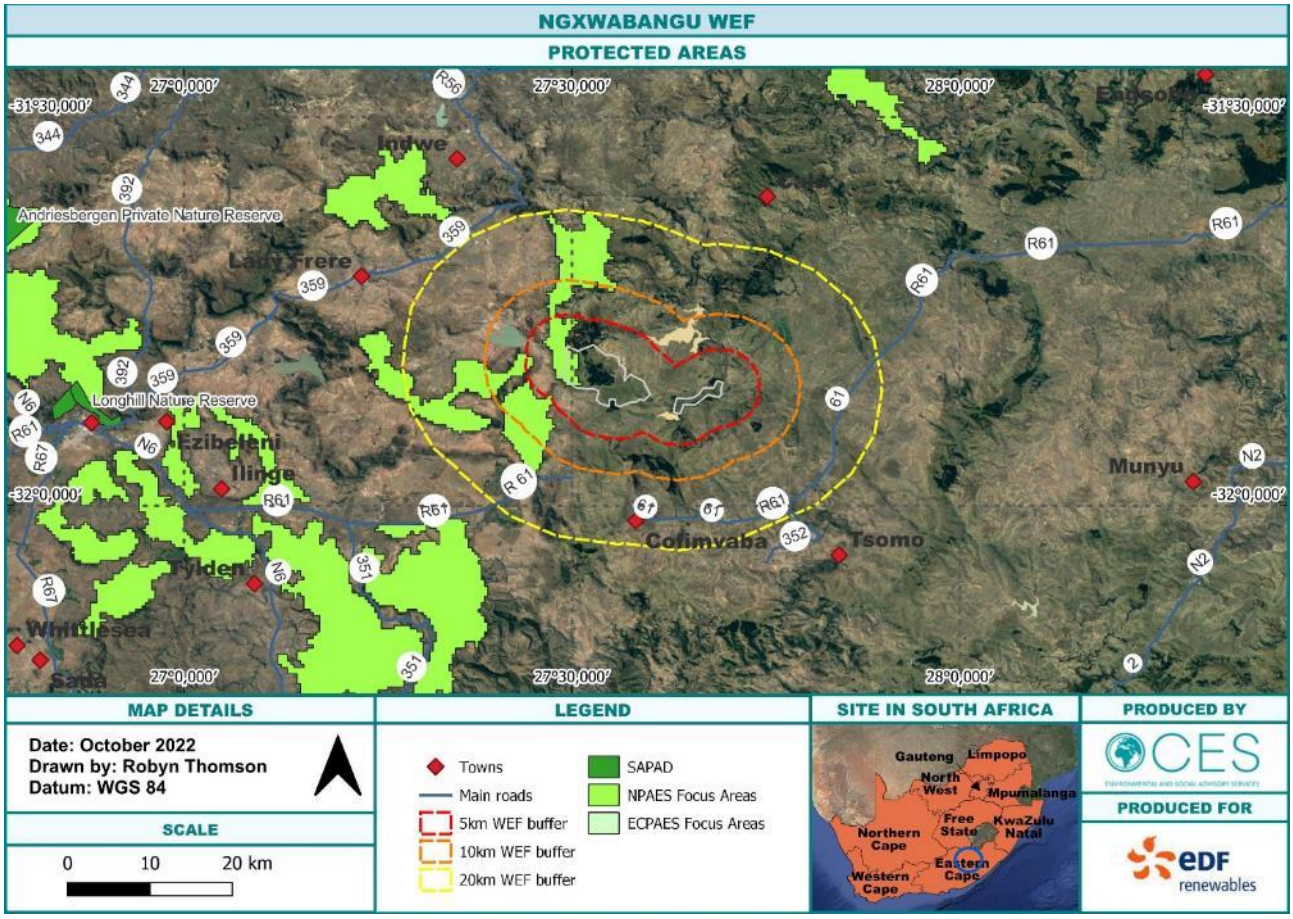


Figure 3-5: Ngxwabangu WEF Protected Areas and NPAES Map

3.10 CONCLUDING REMARKS

When considering the overall need for the development of the proposed Ngxwabangu WEF, the social and economic benefits are clearly in support in terms of need and desirability, from a planning and policy perspective on a national level but also at the provincial, district, and local level.

The proposed WEF project developer has also indicated that local socio-economic benefits will be realised with the development of the WEF, specifically in line with the socio-economic development goals under the REIPPPP, which will include:

- The realisation of the local needs and requirements within the area;
- Tourism initiatives within the area;
- Job creation within area;
- The creation of a second income for the affected landowners;
- An increase in the standard of living; and

- An overall economic and social upliftment within the area.

The construction and operation of the proposed Ngxwabangu WEF will contribute to local developmental objectives of poverty eradication and other social and socio-economic benefits that are integral to the REIPPPP process. The development of wind farms attracts significant direct foreign financial investment into South Africa and local communities. REIPPPP local content requirements can lead to the creation of local industry and both skilled and un-skilled jobs in the RE industrial sector.

However, when considering the overall need for the development of the proposed WEF project, it is also important to consider the potential costs of the proposed WEF. Relevant costs associated with the proposed WEF are particularly applicable due to potential negative impacts on biodiversity conservation initiatives in the affected area (such as the Cape Vulture). These aspects need to be thoroughly considered during this BA Process, in consultation with the various relevant stakeholders including DFFE, DFFE Biodiversity and Conservation, DEDEAT, BirdLife SA, Vulpro and EWT, amongst others. The Biodiversity Offset Strategy (Appendix E) requires stakeholder involvement and this is a critical component to the BA process.

Therefore, considering the above, it has been imperative for the BAR to consider this project not only from a policy (national, provincial and local level) perspective, but also from a biophysical and socio-economic perspective. The aim of this process has been to ensure a balance between these three spheres and the key chapters of this report (Chapters 7, 7.4.2, 9, 10, 11 and 13) draw on both the potential positive and potential negative impacts of the proposed development.

4 RELEVANT LEGISLATION

The development of the proposed Ngxwabangu WEF will be subject to the requirements of various items of South African legislation. These are described below.

4.1 THE CONSTITUTION ACT (ACT NO. 108 OF 1996)

This is the supreme law of the land. As a result, all laws, including those pertaining to the proposed development, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, everyone has the right:

(a) To an environment that is not harmful to their health or well-being.
(b) To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:
    (i) Prevent pollution and ecological degradation.
    (ii) Promote conservation.
    (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

- *The WEF developer has an obligation to ensure that the proposed activity will not result in pollution and ecological degradation.*
- *The WEF developer has an obligation to ensure that the proposed activity is ecologically sustainable, while demonstrating economic and social development.*

4.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998 AND SUBSEQUENT AMENDMENTS)

The NEMA (Act No. 107 of 1998) provides for the basis for environmental governance in South Africa by establishing principles and institutions for decision-making on matters affecting the environment.

A key aspect of the NEMA is that it provides a set of environmental management principles that apply throughout the Republic to the actions of all organs of state that may significantly affect the environment. Section 2 of NEMA contains principles (see Table 4-1) relevant to the proposed WEF project, and likely to be utilised in the process of decision making by DFFE.

Table 4-1: NEMA Environmental Management Principles

(2)	Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
(3)	Development must be socially, environmentally and economically sustainable.
(4)(a)	Sustainable development requires the consideration of all relevant factors including the following: i. That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; iii. That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.
(4)(e)	Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.

(4)(i)	The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
(4)(j)	The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
(4)(p)	The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.
(4)(r)	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

As these principles are utilised as a guideline by the competent authority in ensuring the protection of the environment, the proposed development should, where possible, be in accordance with these principles. Where this is not possible, deviation from these principles would have to be very strongly motivated.

NEMA introduces the duty of care concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution and may lead to the prosecution of managers or directors of companies for the conduct of the legal persons.

Employees who refuse to perform environmentally hazardous work, or whistle blowers, are protected in terms of NEMA.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

- *The WEF developer must be mindful of the principles, broad liability and implications associated with NEMA and must eliminate or mitigate any potential impacts.*
- *The WEF developer must be mindful of the principles, broad liability and implications of causing damage to the environment.*

4.3 National Environmental Management: Protected Areas Act (Act No. 57 of 2003)

The National Environmental Management: Protected Areas Act (NEMPAA, Act No. 57 of 2003) mainly provides for the following:

- Declaration of nature reserves and determination of the type of reserve declared.
- Cooperative governance in the declaration and management of nature reserves.
- A system of protected areas in order to manage and conserve biodiversity.
- Utilization and participation of local communities in the management of protected areas.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

The Act is not relevant to the proposed WEF based on the National Protected Areas Database. But the site does fall within a NPAES Focus Area.

4.4 NATIONAL ENVIRONMENT MANAGEMENT: BIODIVERSITY ACT (NO. 10 OF 2004)

The National Environment Management: Biodiversity Act (NEM:BA, Act No. 10 of 2004) provides for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems that warrant national protection.

The objectives of this Act are to:

- Provide, within the framework of the National Environmental Management Act.
- Manage and conserve of biological diversity within the Republic.
- Promote the use of indigenous biological resources in a sustainable manner.

The Act provides for the management and conservation of South Africa's biodiversity within the framework of the NEMA (Act No. 107 of 1998). In terms of the Biodiversity Act, the developer has a responsibility for:

1. The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (including The Endangered and Threatened Ecosystem Regulations, Government Notice R. 1002 dated 9th December 2011).
2. Application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity.
3. Limit further loss of biodiversity and conserve endangered ecosystems.

The Act's permit system is further regulated in the Act's Threatened or Protected Species Regulations Government Notice R. 152, dated the 23rd of February 2007.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

- *The WEF developer must not cause a threat to any endangered ecosystems and must protect and promote biodiversity;*
- *The WEF developer must assess the impacts of the proposed development on endangered ecosystems;*
- *The WEF developer may not remove or damage any protected species without a permit; and*
- *The WEF developer must ensure that the site is cleared of alien vegetation using appropriate means (AIS Regulations, Government Notice R. 598 of the 1st of April 2014 are applicable)*

4.5 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT (NO. 39 OF 2004)

The National Environmental Management: Air Quality Act (NEM:AQA, Act No. 39 of 2004) is the principal legislation regulating air quality in South Africa. The objects of the Act are to:

- Give effect to Section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people, and
- Protect the environment by providing reasonable measures for:
  - Protection and enhancement of the quality of air in the Republic.
  - Prevention of air pollution and ecological degradation.
- Securing ecologically sustainable development while promoting justifiable economic and social development.

The Air Quality Act empowers the Minister to establish a national framework for achieving the objects of this Act. The said national framework will bind all organs of state. The said national framework will inter alia have

to establish national standards for municipalities to monitor ambient air quality and point, non-point and mobile emissions.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

Although no major air quality issues are expected, the WEF developer needs to be mindful of the Act as it also relates to potential dust generation during construction, etc.

4.6 National Environmental Management: Waste Management Act (No. 59 of 2008)

The National Environmental Management: Waste Management Act (NEM:WA, Act No. 59 of 2008) gives legal effect to the Government's policies and principles relating to waste management in South Africa, as reflected in the National Waste Management Strategy (NWMS).

The objects of the Act are (amongst others) to protect health, well-being and the environment by providing reasonable measures for:

- Minimising the consumption of natural resources;
- Avoiding and minimising the generation of waste;
- Reducing, re-using, recycling and recovering waste;
- Treating and safely disposing of waste as a last resort;
- Preventing pollution and ecological degradation; and
- Securing ecologically sustainable development while promoting justifiable economic and social development.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

- *The WEF developer must ensure that all activities associated with the project address waste related matters in compliance with the requirements of the Act.*
- *The WEF developer must consult with the local municipalities to ensure that waste is disposed of at a registered landfill site.*

4.7 National Forests Act (No. 84 of 1998)

The objective of this Act is to monitor and manage the sustainable use of forests. In terms of Section 12 (1) (d) of this Act and GN No. 1012 (promulgated under the National Forests Act), no person may, except under licence:

- Cut, disturb, damage or destroy a protected tree.
- Possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

If any protected trees or indigenous forest in terms of this Act occur on site, the WEF developer will require a licence from the Department of Forestry (DAFF) to perform any of the above-listed activities.

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

The protection of archaeological and paleontological resources is the responsibility of a provincial heritage resources authority, and/or the South African Heritage Resources Agency (SAHRA). All archaeological objects, paleontological material and meteorites are the property of the State. "*Any person who discovers archaeological or paleontological objects or material or a meteorite in the course of development must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority*".

RELEVANCE TO THE PROPOSED NGWABANGU WEF

- *SAHRA/ECPHRA must be informed of the project and BA process.*
- *A Heritage Impact Assessment (HIA) must be undertaken by a suitably qualified specialist (this has been included as part of this submission).*
- *No person may alter or demolish any structure or part of a structure, which is older than 60 years or disturb any archaeological or paleontological site or grave older than 60 years without a permit issued by the relevant provincial heritage resources authority.*
- *No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter or deface archaeological or historically significant sites.*

4.9 Electricity Regulation Act (No. 4 of 2006)

The Electricity Regulation Act (Act No. 4 of 2006) came into effect on the 1st of August 2006 and the objectives of this Act are to:

- Facilitate universal access to electricity.
- Promote the use of diverse energy sources and energy efficiencies.
- Promote competitiveness and customer and end user choice.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

The proposed WEF is in line with the call of the Electricity Regulation Act as it has the potential to improve energy security of supply through diversification.

4.10 Occupational Health and Safety Act (No. 85 of 1993)

The objective of this Act is to provide for the health and safety of persons at work. In addition, the Act requires that, "as far as reasonably practicable, employers must ensure that their activities do not expose non-employees to health hazards". The importance of the Act lies in its numerous regulations, many of which will be relevant to the proposed Ngxwabangu WEF. These cover, among other issues, noise and lighting.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

The WEF developer must be mindful of the principles and broad liability and implications contained in the OHSA and mitigate any potential impacts.

4.11 Aviation Act (No. 74 of 1962): 13th Amendment of the Civil Aviation Regulations 1997

Section 14 of obstacle limitations and marking outside aerodrome or heliport (CAR Part 139.01.33) under this Act specifically deals with wind turbine generators (wind farms). According to this section, "A wind turbine generator is a special type of aviation obstruction due to the fact that at least the top third of the generator

is continuously variable and offers a peculiar problem in as much marking by night is concerned. The Act emphasizes that, when wind turbine generators are grouped in numbers of three or more, they will be referred to as "wind farms".

RELEVANCE TO THE PROPOSED NGWABANGU WEF

Due to requirements of the Act to ensure the safety of aircrafts, the WEF developer must engage directly with the Civil Aviation Authority regarding the structural details of the facility.

4.12 National Water Act (No. 36 of 1998)

The National Water Act (NWA, Act No. 36 of 1998) provides for fundamental reform of the law relating to water resources in South Africa.

The purpose of the Act amongst other things is to:

- Ensure that the national water resources are protected, used, developed, conserved, managed and controlled in ways which consider amongst other factors:
  - Promoting equitable access to water;
  - Promoting the efficient, sustainable and beneficial use of water in the public interest;
  - Facilitating social and economic development;
  - Protecting aquatic and associated ecosystems and their biological diversity; and
  - Reducing and preventing pollution and degradation of water resources.

The NWA is concerned with the overall management, equitable allocation and conservation of water resources in South Africa. To this end, it requires registration of water users and licenses to be obtained for water use except for certain limited instances set out in the Act. These instances include domestic use, certain recreational use, where the use occurs in terms of an existing lawful use or where the Department of Water and Sanitation (DWS) has issued a general authorisation that obviates the need for a permit.

Water use for which a permit is required

For the purposes of this Act, water uses for which a permit is required (amongst other), are defined in Section 21 as follows:

- Taking water from a water resource.
- Storing water.
- Impeding or diverting the flow of water in a watercourse.
- Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
- Disposing of waste in a manner which may detrimentally impact on a water resource.
- Altering the bed, banks, course or characteristics of a watercourse.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

The development will require water use authorisation from the DWS, in terms of Section 21 of the National Water Act, prior to the commencement of construction.

4.13 Conservation of Agricultural Resources Act (No. 43 of 1983)

The Conservation of Agricultural Resources Act (CARA, Act No. 43 of 1983) is the main statute that deals with agricultural resource conservation.

The objects of the Act are to provide for the conservation of the natural agricultural resources of South Africa by the maintenance of the production potential of land. In order to maintain production potential of land, CARA provides for the following mechanisms; namely:

- Combating and prevention of erosion and weakening and destruction of water sources.
- Protection of vegetation.
- Combating of weeds and invader plants.

In order to give meaning to mechanisms aimed at maintaining production potential of land provided for in CARA, the Minister of Agriculture published regulations under CARA (CARA Regulations) which prescribes control measures which all land users have to comply, in respect of a number of matters, including the:

- Cultivation of virgin soil.
- Protection of cultivated land.
- Utilisation and protection of the veld.
- Control of weed and invader plants.
- Prevention and control of veld fires and the restoration and reclamation of eroded land.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

Strategic Agricultural nodes have been avoided by the proposed WEF. Subsistence crop and grazing activities can continue in conjunction with the proposed WEF development.

4.14 Subdivision of Agricultural Land Act (No. 70 of 1970)

The Subdivision of Agricultural Land Act (Act No. 70 of 1970) controls the subdivision of all agricultural land in South Africa and prohibits certain actions relating to agricultural land. In terms of the Act, the owner of agricultural land is required to obtain consent from the Minister of Agriculture in order to subdivide agricultural land.

The purpose of the Act is to prevent uneconomic farming units from being created and degradation of prime agricultural land. The Act also regulates leasing and selling of agricultural land as well as registration of servitudes.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

Approval will be required from the DAFF for any activities on the land zoned for agriculture and any proposed rezoning or sub-divisions of agricultural land.

4.15 Mineral and Petroleum Resources Development Act (No. 28 of 2002)

The Mineral and Petroleum Resources Development Act (MPRDA, Act No. 28 of 2002) makes provision for equitable access to and sustainable development of the South Africa's mineral and petroleum resources and to provide for matters connected therewith.

The objects of this Act are (amongst others) to:

- Give effect to the principle of the State's custodianship of the nation's mineral and petroleum resources.
- Promote equitable access to the nation's mineral and petroleum resources to all the people of South Africa.
- Give effect to Section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development.

Application for a mining right
As per Section 27 (1) of the Act, the DMRE must grant permission for all mining operations. Both the removal of sand and/or stone from a borrow pit or quarry requires an application for a mining permit or a mining right.

There are two (2) categories of permission relevant to borrow pits and hard rock quarries, namely; "Mining Permits" and secondly "Mining Rights." As is reflected in the table below, these categories are linked to the size of the proposed operation and the proposed operational period.

CATEGORY	SIZE	PERIOD OF OPERATION	DMRE REQUIREMENT
Mining Permit	< 1.5 ha	< 2 years	EIA: Basic Assessment EMPr
Mining Right (Licence)	> 1.5 ha	< 30 years	EIA: Scoping and EIA EMPr

In addition, Section 53 of the Act requires that Ministerial approval is attained for "any person who intends to use the surface of any land in any way which may be contrary to any object of this Act or is likely to impede any such object".

RELEVANCE TO THE PROPOSED NGWABANGU WEF

- *Any activities associated with the WEF requiring extraction of sand or hard rock for construction purposes will require the submission of an application to DMRE for either a mining permit or mining licence.*
- *The Ngxwabangu WEF must apply to the Minister of Mineral Resources for approval to use the land for the purposes of the WEF.*
- *The DMRE has aligned its authorisation process with that of the DFFE, and from August 2015, all applications for mining activities require an Environmental Impact Assessment, as per the EIA Regulations.*

4.16 National Road Traffic Act (No. 93 of 1996)

The National Road Traffic Act (NRTA, Act No. 93 of 1996) provides for all road traffic matters and is applied uniformly throughout South Africa. The Act enforces the necessity of registering and licensing motor vehicles. It also stipulates requirements regarding fitness of drivers and vehicles as well as making provision for the transportation of dangerous goods.

RELEVANCE TO THE PROPOSED NGWABANGU WEF

All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed wind farm.

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

The aim of the Act is to "prevent and combat veld, forest and mountain fires" in South Africa. Of relevance to the proposed Ngxwabangu WEF development the following requirements of the Act need to be considered:

RELEVANT SECTION OF THE ACT	RELEVANT TO THE PROPOSED NGXWABANGU WEF:
Section 3: Fire Protection Associations.	The proposed Ngxwabangu WEF must register as a member of the fire protection association in the area.
Chapter 4 Section 12-14: Veld fire prevention: duty to prepare and maintain firebreaks	The proposed Ngxwabangu WEF will be required to take all practicable measures to ensure that fire breaks are prepared and

	maintained according to the specifications contained in Section 12 – 14.
Section 17: Firefighting: readiness	The proposed Ngxwabangu WEF must have the appropriate equipment, protective clothing and trained personnel for extinguishing fires. In addition to this a Fire Management Plan is required.

4.18 Other Relevant National Legislation

Other legislation that may be relevant to the proposed Ngxwabangu WEF includes:

- The Environment Conservation Act No 73 of 1989 (ECA) Noise Control Regulations, which specifically provide for regulations to be made with regard to the control of noise, vibration and shock, including prevention, acceptable levels, powers of local authorities and related matters.
- The Telecommunication Act (1966) which has certain requirements with regard to potential impacts on signal reception.
- Provincial Nature and Environmental Conservation Ordinance (No. 19 of 1974), which lists SCC which require permits for removal. Schedules 1 to 4 list protected and endangered plant and animal species.
- Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013 – came into force on 1 July 2015) aims to provide inclusive, developmental, equitable and efficient spatial planning at the different spheres of the government. This act repeals national laws on the Removal of Restrictions Act, Physical Planning Act, Less Formal Township Planning Act and Development Facilitation Act.

In addition to the above, aside from the environmental authorisation, there are other permits, contracts and licenses that will need to be obtained by the project proponent for the proposed project some of which fall outside the scope of the BA Process. However, for the purposes of completeness, these include but are not limited to:

- Local Municipality: Land Rezoning Permit. LUPO Ordinance 15 of 1985.
- National Energy Regulator of South Africa (NERSA): Generation License.
- Eskom: Connection agreement and Power Purchase Agreement (PPA).

5 DESCRIPTION OF THE RECEIVING ENVIRONMENT

The current chapter outlines the biophysical and socio-economic features of the receiving environment, where the Ngxwabangu WEF is being proposed. The information contained here within has been extracted from specialist reports, where relevant.

5.1 GEOLOGY, TOPOGRAPHY AND SOILS

The study site is underlain by sedimentary deposits (mudstone and arenite) belonging to the Tarkastad Subgroup (the upper subdivision of the Beaufort Group) which has been intruded by Karoo Dolerite (Figure 5-1).

The Beaufort Group covers a surface area of approximately 200 000 km^2 and is made up of fluvial rocks deposited about 250 million years ago within the Main Karoo Basin of South Africa. The strata in the Beaufort Group consist predominantly of mudstones and sandstones deposited by a variety of fluvial systems (Catuneanu et al., 2005). The Beaufort Group was intruded by a network of igneous dykes and sills known as the Karoo Dolerite Suite (Neumann et al., 2011) which disturbed and baked the sedimentary strata of the Tarkastad Subgroup and other Karoo successions (Mzana, 2016).

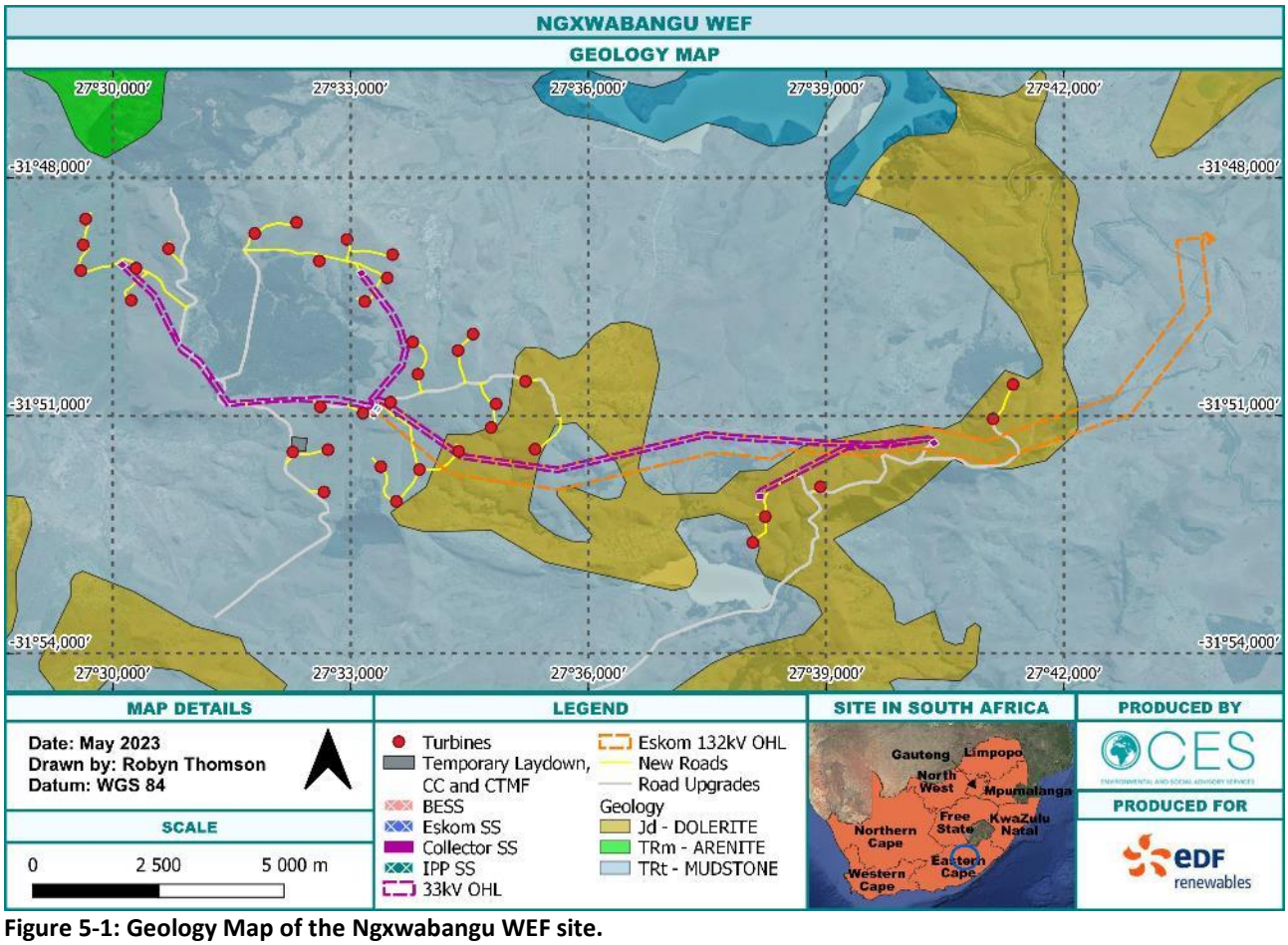


Figure 5-1: Geology Map of the Ngxwabangu WEF site.

The topography of the broader project area is characterised by low to moderately undulating hills, cut by rivers and drainage lines. The altitude of the project area ranges from 1200 m to 1550m and the average slope ranges from 8.1% to 12.9% (Figure 5-2).

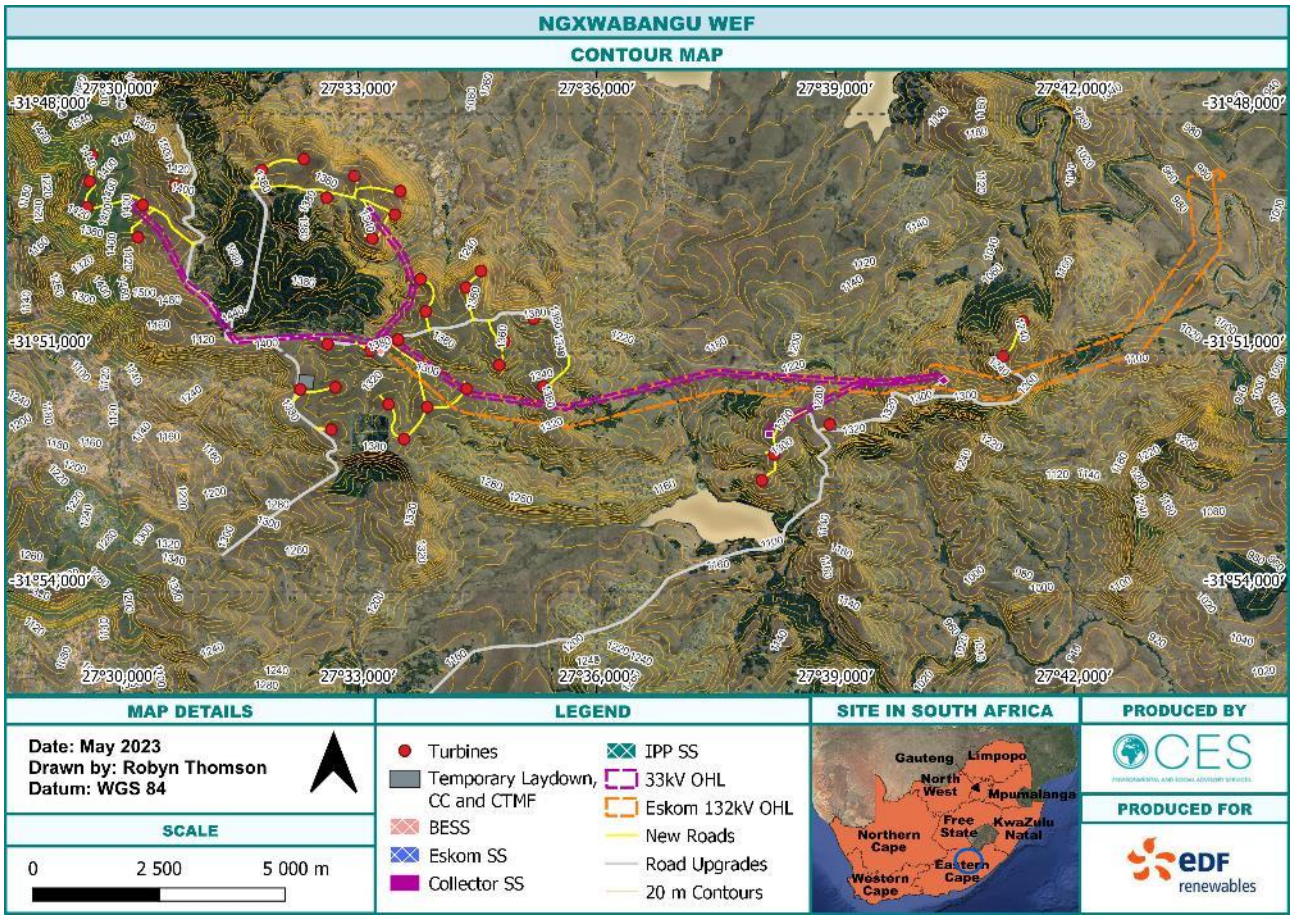


Figure 5-2: Contour Map of the Ngxwabangu WEF site and surrounds

According to SOTER (1995), the soil type underlying the majority of the study area is classified as Lithic Leptosols, whilst a very small portion of the north-eastern boundary of the Ngxwabangu Study Site intersects with Haplic Lixisols (Figure 5-3).

Leptosols as very shallow soils which overly continuous rock. These soils are usually extremely gravelly and/or stony and the parent material consists of various types of continuous rock or of unconsolidated materials with less than 20% fine earth. Leptosols generally occur in areas of high or medium altitude, with strongly dissected topographies (Nachtergaele, 2010).

The World Reference Base for Soil Resources (WRB) defines Lixisols as soils with *subsurface accumulation of low activity clays and high base saturation. They develop under intensive tropical weathering conditions and subhumid to semi-arid climate*.

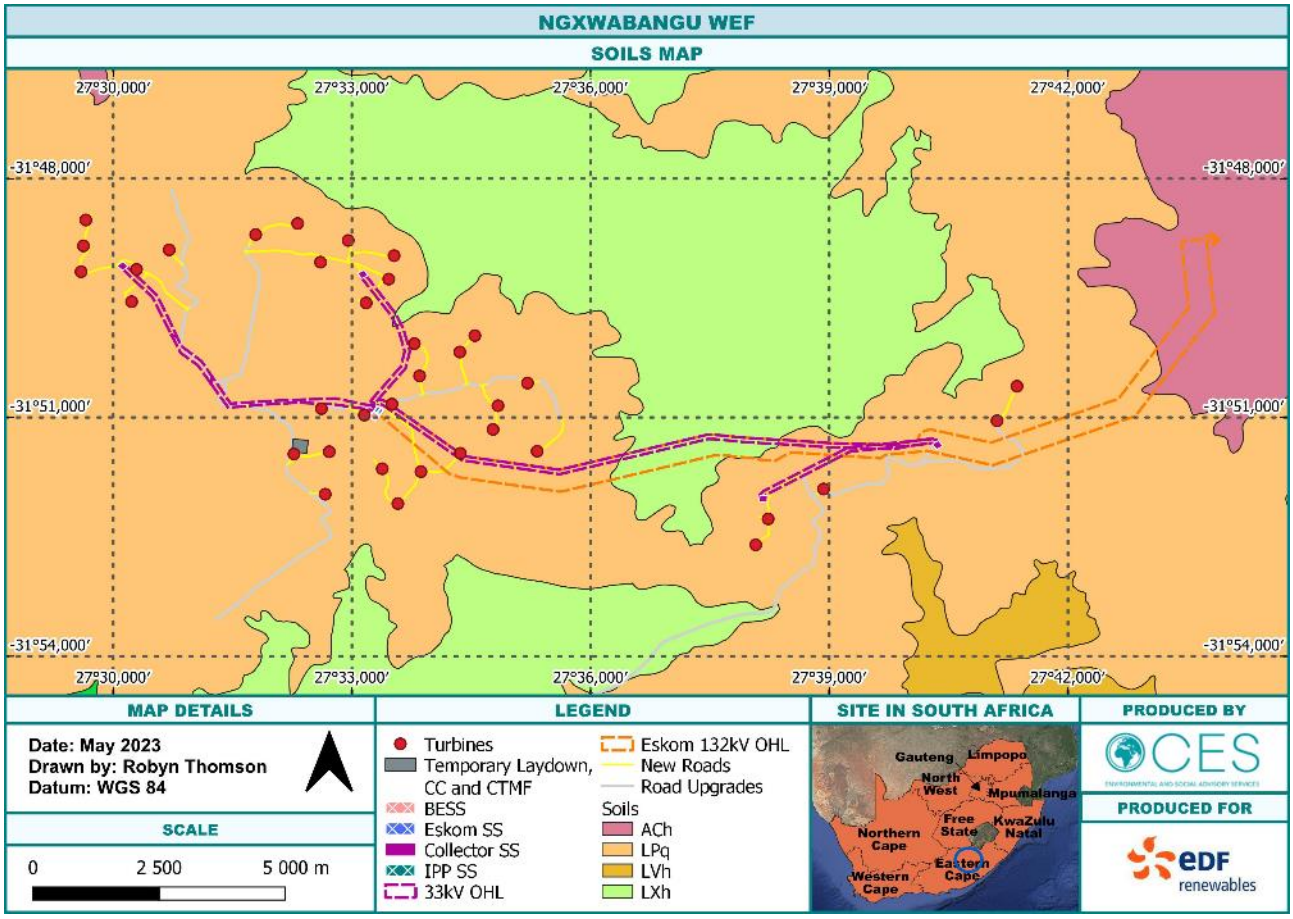


Figure 5-3: Soils Map of the Ngxwabangu WEF site and surrounds

5.2 CLIMATE

The Eastern Cape Province of South Africa has a complex climate due to its location at the confluence of two climatic regimes, namely temperate and subtropical. As a result, there are wide variations in temperature, rainfall and wind patterns, mainly as a result of movements of air masses, altitude, mountain orientation and the proximity of the Indian Ocean.

Table 5-1: Average Temperatures and Rainfall Data for Cofimvaba (Source: weatherspark.com).

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Avg. Temp. (°C)	20	20	19	16	13	11	11	12	14	16	17	19
Min. Temp. (°C)	15	15	14	11	8	5	4	6	8	10	12	13
Max. Temp. (°C)	27	26	25	23	21	18	18	20	20	23	24	26
Rainfall (mm)	112	122	94	53	20	18	20	25	43	76	104	106

Cofimvaba, within close proximity to the Ngxwabangu WEF site, receives an average of approximately 530 mm of precipitation per annum, with the highest rainfall months of December, January and February (summer). The average minimum temperature is 10°C, with the lowest minimum temperatures occurring during the month of July (winter). The average maximum temperature is 23°C, with the highest maximum temperatures occurring during the month of January (summer). Table 5-1 above indicates the average temperatures and rainfall data per month for Cofimvaba.

5.3 LANDUSE AND LANDCOVER

Large residential areas and villages surround the project area. The landscape and natural vegetation within the project area therefore provides important ecosystem goods and services to community members, such as freshwater, erosion control, pollination, food, medicine, building materials, fuel (wood), amongst others. These landscapes are also appreciated for their cultural value as they provide spiritual, aesthetical, and social coherence (Bengtsson et al., 2019), through the provision of burial grounds, sacred sites, land for cattle and subsistence farming, amongst others.

Cattle and subsistence farming are the major land uses within the project area. The centre of the Ngxwabangu Study Area also consists of plantation largely dominated by Acacia spp. Evidence of sand mining / excavation was also observed on site.

According to the South African National Land-Cover (2020) spatial dataset, there are seven (7) major land classes within the proposed site, including *Natural Grassland, Herbaceous Wetlands, Subsistence Annual Crops, Fallow Land & Old Fields (Grass), Contiguous & Dense Planted Forest, Dense Forest & Woodland, Contiguous Low Forest & Thicket*. The "*Dense and Planted Forest*" represents the large plantation in the centre of the Ngxwabangu WEF which is largely dominated by Acacia spp. Analysis of Google Earth Imagery and the site visit confirmed that large areas classified as "Dense Forest & Woodland" and "Contiguous Low Forest & Thicket" by the SANLC (2020), are actually natural grassland, please see Ecological Impact Assessment, Appendix D. Large areas classified as "Residential Formal" and "Village Scattered" by the SANLC (2020) surround the project area and represent the existing communities and villages established within the project area (please see Figure 5-4).

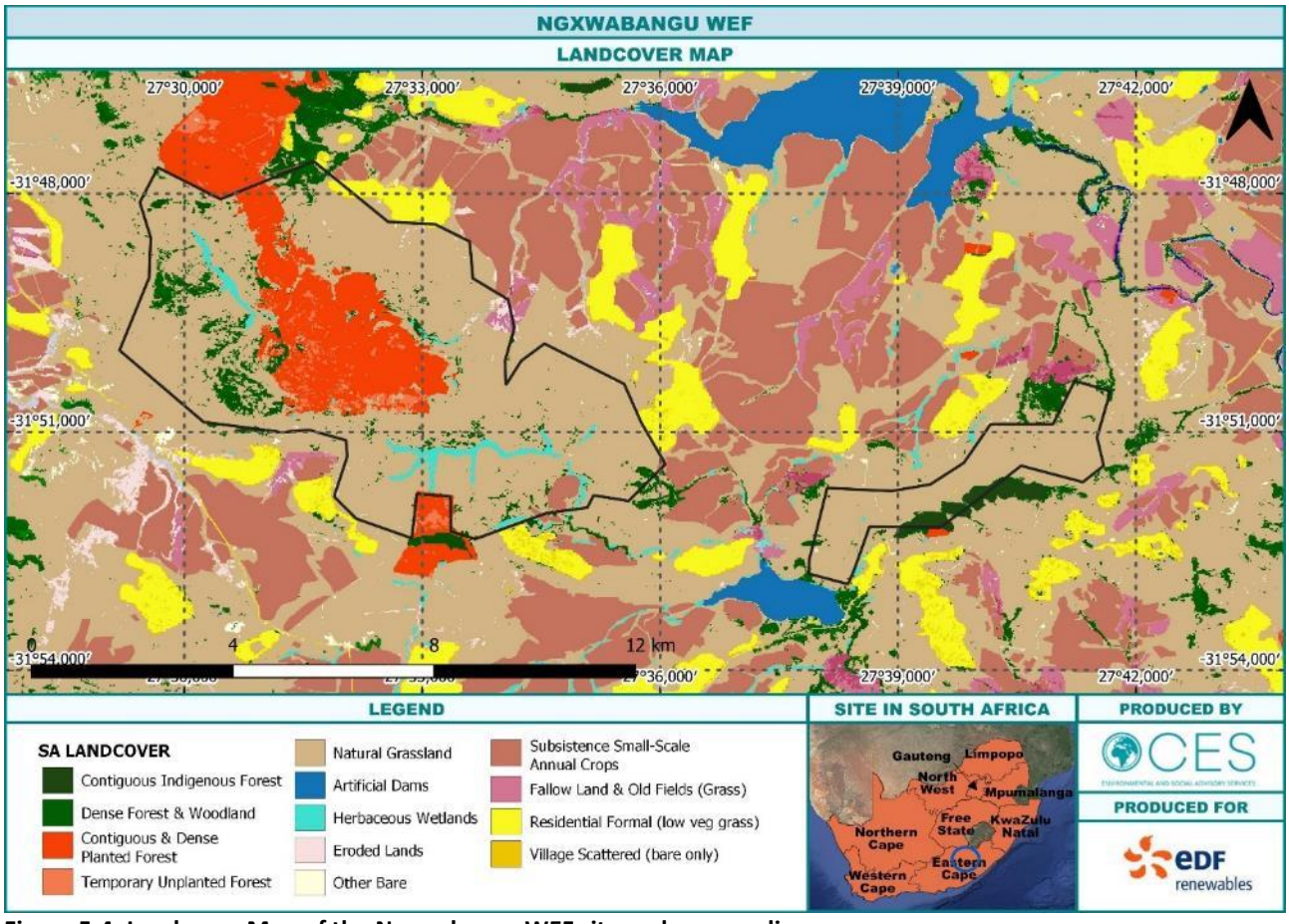


Figure 5-4: Landcover Map of the Ngxwabangu WEF site and surrounding areas.

5.4 VEGETATION & FLORISTICS

The project area falls within the grassland biome. Grasslands in South Africa boast remarkable biodiversity and cover approximately one third of South Africa's total land surface area, stretching over the majority of the Eastern Cape and KwaZulu-Natal Provinces. These ecosystems provide important habitat for a range of the country's rare, endangered and endemic animal and plant species, with plant diversity of the grassland biome only second to that of the fynbos biome. The incredible diversity and provision of ecosystem services has contributed to the classification of this ecosystem as an important biodiversity asset of global significance. Grasslands are considered important water production landscapes and provide various ecosystem services particularly for rural communities in South Africa (SANBI, 2013).

The South African Vegetation Map (SA VEGMAP) of 2018 is an important resource for biodiversity monitoring and conservation management in South Africa. Under the custodianship of the South African National Biodiversity Institute (SANBI) the SA VEGMAP, (2018) was updated in order to 'provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before'. The map provides a detailed description of each of South Africa's unique vegetation types along with a comprehensive list of the important species associated with each, including endemic and biologically important species.

According to SANBI's National Vegetation Map (2018), the proposed development occurs within two (2) of the three (3) regional vegetation types, namely Drakensberg Foothill Moist Grassland and Tsomo Grassland. Additionally, patches of Southern Mistbelt Forest are delineated along the south-eastern boundary of the proposed WEF (Figure 5-5).

Both Drakensberg Foothill Moist Grassland and Tsomo Grassland fall under the Sub-Escarpment Grassland Group. Sub-Escarpment Grasslands are mesic grasslands and occur on flat to gently rolling hills, cut by deep river valleys, at mid-altitudes (760-1800 masl). They are characterised by long-lived forbs that are adapted to frequent aboveground disturbance (such as fire) after which they are able to resprout due to the storage of carbohydrates in underground storage organs. Most species reproduce through vegetative reproduction. Reproduction through seedlings is infrequent and seedlings are generally only viable for a short period. Sub-Escarpment Grasslands are adapted to warm, wet summers with high rainfall and dry, temperate winters with moderate to heavy frost and soils depleted of nutrients.

The different vegetation types are discussed in more detail below, as per the Ecological Impact Assessment, Appendix D.

5.4.1 DRAKENSBERG FOOTHILL MOIST GRASSLAND

Drakensberg Foothill Moist Grassland occurs in a broad arc on moderately rolling mountains of the Drakensberg Piedmonts in the KwaZulu-Natal and Eastern Cape Provinces at an altitude of approximately 880-1860 m. It is a forb-rich grassland dominated by short grasses of the species *Themeda traindra* and *Tristachya leucothrix*, underlain by well-drained soil derived from sedimentary parent material such as mudstones and sandstones of the Tarkastad subgroup and Molteno Formation (Karoo Supergroup) and intrusive dolerites (Mucina *et al*., 2006).

Drakensberg Foothill Moist Grassland boasts a considerable concentration of local endemics as well as Drakensberg endemics. The ecosystem threat status of this vegetation type is classified as **Least Concern** according to the Red List of Terrestrial Ecosystems of South Africa (SANBI, 2021). The historical extent of this vegetation type amounted to 10944.67 km^2, 70% of which currently remains. It is considered poorly protected, and the primary threats to this vegetation type include agriculture, plantations, invasion by alien

plant species (particularly *Rubus, Acacia dealbata* and *Solanum mauritianum)*, overgrazing, and altered fire regimes. The conservation target for this vegetation type is 23%.

5.4.2 TSOMO GRASSLAND

Tsomo Grassland occurs on flat to undulating plains underlain by mudstones of the Tarkastad Subgrorup, at altitudes of 760-1580 m, in between the mountain peaks and ridges within the Eastern Cape Province. This vegetation type typically represents grassland dominated by *Cymbopogon, Elionurus, Eragrostis, Aristida* and *Themeda* interspersed by prominent species belonging to the Asteraceae and Fabaceae family. When overgrazed, the grassland is often replaced by dwarf shrubland dominated by *Aristida* spp. and *Elionurus muticus* and the invading unpalatable shrub *Euryops floribundus* (Mucina *et al*., 2006).

According to the Red List of Terrestrial Ecosystems of South Africa (SANBI, 2021), Tsomo Grassland is classified as **Least Concern**. The historical extent amounted to 6137.24 km^2, 61% of which currently remains. Tsomo Grassland has a conservation status of 23% however, it is not protected. Primary threats to this vegetation type include agriculture, artificial water bodies, erosion and alien invasion by *Schkuhria pinnata* and *Tagetes minuta*.

5.4.3 SOUTHERN MISTBELT FOREST

Analysis of the SA VEGMAP (2018) prior to the site visit indicated that Southern Mistbelt Forest occurs on the southern facing slopes, outside and along the southern border of the WEF. Southern Mistbelt Forest is endemic to South Africa and typically occurs as patches in shadow habitats on south- and southeast-facing slopes along the Great Escarpment. In low altitudes, these forests represent more of a scrub forest with a low, unstructured canopy characterised by high species diversity. In high altitudes, Southern Mistbelt Forest is characterised by a tall canopy, with a mixture coarse-grained canopy gap/disturbance driven dynamics and regeneration characteristics. Dominant species include emergent trees such as *Afrocarpus falcatus, Celtis africana, Calodendrum capense, Vepris lanceolata* and *Zanthoxylum davyi,* (SANBI, 2021).

According to South Africa's Terrestrial Red List of Ecosystems (RLE), Southern Mistbelt Forest is classified as **Least Concern** (SANBI, 2021). Its historical extent was 1061.95 km^2 and the remaining natural extent amounts to 83%. This vegetation type has experienced low rates of natural habitat loss and biotic disruptions, placing this ecosystem at low risk of collapse. Southern Mistbelt Forest is classified as moderately protected. It should be noted that all natural forests are protected in terms of the National Forest Act (NFA) (Act No. 84 of 1998). As such, and in accordance with the guiding principles outlined in Section 3 of the NFA, the Southern Mistbelt Forest patches within the project area have been classified as 'no-go' areas.

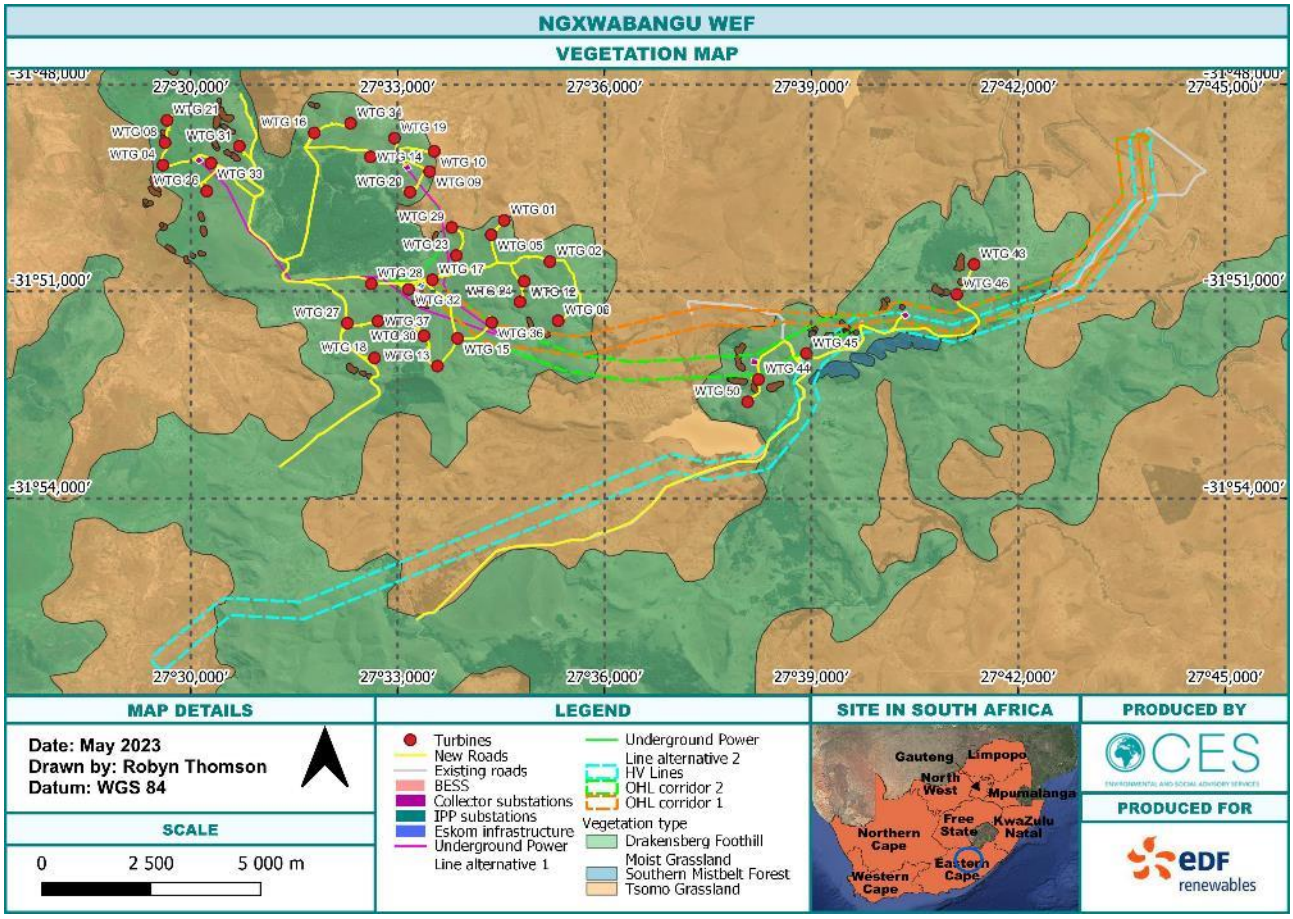


Figure 5-5: SANBI Vegetation Map of the Ngxwabangu WEF site and surrounding areas.

5.5 EASTERN CAPE BIODIVERSITY CONSERVATION PLAN

The ECBCP (2019) replaces the ECBCP (2007) in its entirety and provides a map of important biodiversity areas, outside of the Protected Areas network, which must be used to inform land use and resource-use planning and decision making. The objectives of the ECBCP (2019) are to:

1) Identify the minimum spatial requirements needed to maintain a living landscape that continues to support all aspects of biodiversity and retain/maintain essential ecological infrastructure. This is achieved through the selection of areas, based on achieving targets, which represent important biodiversity pattern AND ecological processes;
2) Serve as the primary source of biodiversity information for land use planning and decision-making; and
3) Inform conservation and restoration action in important biodiversity areas.

The aim of the ECBCP (2019) was to map biodiversity priority areas through a systematic conservation planning process. The main outputs of the ECBCP include Protected Areas (PAs), CBAs, ESAs, Other Natural Areas (ONA) and No Natural Habitat Remaining (NNR) for both terrestrial and aquatic ecosystems.

In terms of the ECBCP (2019), the project area falls within a Terrestrial CBA 1, CBA 2, ESA 1, and ESA 2. However, a portion of the Ngxwabangu Study Site along the north-eastern boundary has “no CBA/ESA Classification”. The plantation within the centre of the site is recognised as a plantation by the ECBCP (2019), however it is classified as an ESA 2. In terms of aquatic CBAs, more than half the Ngxwabangu Study Site falls within an Aquatic ESA 1.

The reason for the Terrestrial CBA 1 classification is that Cape Vultures are known to occur within the project area, the presence of which was confirmed by the avifaunal specialist appointed for this project. The desired management objectives and recommendations for the biodiversity priority features within the landscape are highlighted in Table 5-2 below. According to the ECBCP (2019), CBAs are areas of high biodiversity value and should therefore be maintained in a natural state with no further loss of habitat. If land use activities are unavoidable in these areas and, depending on expert opinion of the condition of the site, a Biodiversity Offset must be designed and implemented. As such a Biodiversity Offset Strategy has been developed as part of this BA Process, kindly refer to Appendix E of this report.

In terms of Aquatic CBAs, the south-western portion of the study site has no ESA/CBA Classification, however all drainage lines and tributaries are classified as ESA 1. The Nququ Rivers which traverses the Ngxwabangu Study Site is classified as a CBA 2. The majority of the eastern half of the project area has no aquatic ESA/CBA classification. However, all drainage lines and tributaries are classified as an ESA 1. All OHL options traverse an ESA 1. Please refer to Figure 5-6 for the Terrestrial CBAs and Figure 5-7 for the Aquatic CBAs within the project area.

Table 5-2: ECBCP CBA Management Requirements (ECBCP Handbook, 2019)

CATEGORY	SENSITIVITY FEATURES	DESIRED MANAGEMENT OBJECTIVE	RECOMMENDATION
ECBCP (2019) Terrestrial CBAs/ESAs			
CBA 1	• CBAs are selected to meet biodiversity targets for species, ecosystems and ecological processes. These include: ▪ Critically Endangered and Endangered Ecosystem. ▪ Critical linkage points (bottlenecks or pinch-points) in the corridor network. ▪ All areas required to meet biodiversity targets and to ensure future persistence of species, ecosystems, and habitats. CBAs are areas of high biodiversity value and should therefore be maintained in a natural state with no further loss of habitat.	Maintain in a natural state (or near-natural state if this is the current condition of the site) that secures the retention of biodiversity pattern and ecological processes: For areas classified as CBA1, the following objectives must apply: • Ecosystem and species must remain intact and undisturbed; • Since these areas demonstrate high irreplaceability, if disturbed or lost, biodiversity targets will not be met; • Important: these biodiversity features are at, or beyond, their limits of acceptable change. If land use activities are unavoidable in these areas, and depending on expert opinion of the condition of the site, a Biodiversity Offset must be designed and implemented.	Based on the desired management objective for areas classified as CBA 1, the study area should be maintained in a natural state. However, if areas classified as CBA 1 cannot be avoided then all infrastructure must avoid sensitive ecosystems such as wetlands and forest patches, as far as practically and feasibly possible. Forest patches have been declared 'no-go' areas. All mitigations and recommendations as specified in this report must be implemented and adhered to. Additionally, the clearance of vegetation must be limited to that which is strictly necessary for the construction of the proposed WEF. Existing roads must be utilised where feasible. **In line with the ECBCP (2019), a biodiversity offset should be investigated for the area of influence lost as a result of the proposed development**. An avifaunal specialist and/or a biodiversity offset specialist must be appointed to identify an appropriate offset for the vultures present within the project area. As such, a Biodiversity Offset Strategy has been developed as part of this BA Process, kindly refer to Appendix E of this report.

CATEGORY	SENSITIVITY FEATURES	DESIRED MANAGEMENT OBJECTIVE	RECOMMENDATION
CBA 2	These areas are considered as natural or near-natural landscapes and biodiversity must be managed for minimal loss of ecosystem integrity. No transformation of natural habitat should be permitted.	Maintain in natural (or near-natural state if this is the current condition of the site) that secures the retention of biodiversity pattern and ecological processes: For areas classified as CBA2, the following objectives apply: • Ecosystems and species must remain intact and undisturbed; • There is some flexibility in the landscape to achieve biodiversity targets in these areas. It must be noted that the loss of a CBA2 area may elevate other CBA 2 areas to a CBA 1 category. • These biodiversity features are at risk of reaching their limits of acceptable change. If land use activities are unavoidable in these areas, and depending on the condition of the site, set-aside areas must be designed in the layout and implemented. If site specific data confirms that biodiversity is significant, unique and/or highly threatened or that a Critically Endangered or Endangered species is present, Biodiversity Offsets must be implemented.	The ECBCP (2019) states that set-aside areas must be designed in the layout and implemented where land use activities are unavoidable in areas classified as CBA 2, depending on the condition of the site. As development within the CBA 2 is not avoidable, a set-aside area / biodiversity offset must be investigated for the total combined area of CBA 2 lost as a result of the proposed development (this has been developed as part of this process and is available as Appendix E of this report). All mitigations and recommendations, as specified in this report, must be implemented and adhered to. The development footprint must be limited to that which is strictly necessary for the construction of the proposed development. Existing roads must be utilised where feasible.
ESA 1	ESAs are not essential for meeting biodiversity targets, but are essential in terms of: • Terrestrial landscape: Ensuring connectivity between CBAs, strengthening climate change resilience and proper function of ecosystem	Maintain ecological function within the localised and broader landscape. A functional state in this context means that the area must be maintained in a semi-natural state such that ecological function and ecosystem services are maintained.	As development within an area classified as an ESA 1 is not avoidable, it is recommended that the design of the proposed WEF ensures connectivity within the landscape for the continuation and persistence of ecosystem corridors, function and services. Sensitive ecosystems such as wetlands and forest patches must be avoided as far as practically and feasibly possible. Forest patches have been declared 'no-go' areas. The

CATEGORY	SENSITIVITY FEATURES	DESIRED MANAGEMENT OBJECTIVE	RECOMMENDATION
	infrastructure for delivery of ecosystem services. From a terrestrial perspective, ESAs may include riparian areas, coastal corridors, ridges, etc.	For areas classified as ESA1, the following objectives apply: • These areas are not required to meet biodiversity targets, but they still perform essential roles in terms of connectivity, ecosystem service delivery and climate change resilience. • These systems may vary in condition and maintaining function is the main objective, therefore: ○ Ecosystems still in natural, near natural state should be maintained. ○ Ecosystems that are moderately disturbed/degraded should be restored.	clearance of vegetation for the development footprint must be strictly limited to that which is necessary. Mitigation measures as specified in this report must be implemented and adhered to in areas classified as aquatic ESA 1.
ESA 2		Maintain current land use with no intensification For areas classified as ESA2, the following objectives apply: • These areas have already been subjected to severe and/or irreversible modification • These areas are not required to meet biodiversity targets, but they may still perform some function with respect to connectivity, ecosystem service delivery and climate change resilience • Objective is to maintain remaining function, therefore: ○ Areas should not undergo any further deterioration in ecological function.	As above. As development within an area classified as an ESA 2 is not avoidable it is recommended that the design of the proposed WEF ensures the connectivity within the landscape for the continuation and persistence of ecosystem corridors, function, and services. Sensitive ecosystems such as wetlands and forest patches must be avoided as far as practically and feasibly possible. Forest patches have been declared 'no-go' areas. The clearance of vegetation for the development footprint must be strictly limited to that which is necessary. Mitigation measures as specified in this report must be implemented and adhered to in areas classified as aquatic ESA 1.

CATEGORY	SENSITIVITY FEATURES	DESIRED MANAGEMENT OBJECTIVE	RECOMMENDATION
		○ Opportunities to change land use practices to improve ecological function (i.e. cultivation agriculture to livestock grazing agriculture) are desirable in ESA2 areas.	
Other Natural Areas and No Natural Habitat Remaining (No ESA/CBA classification)		No desired state or management objective is provided for ONA or NNR.	The clearance of vegetation for the development footprint must be limited to that which is strictly necessary. Mitigation measures as specified in this report must be implemented and adhered to in areas classified

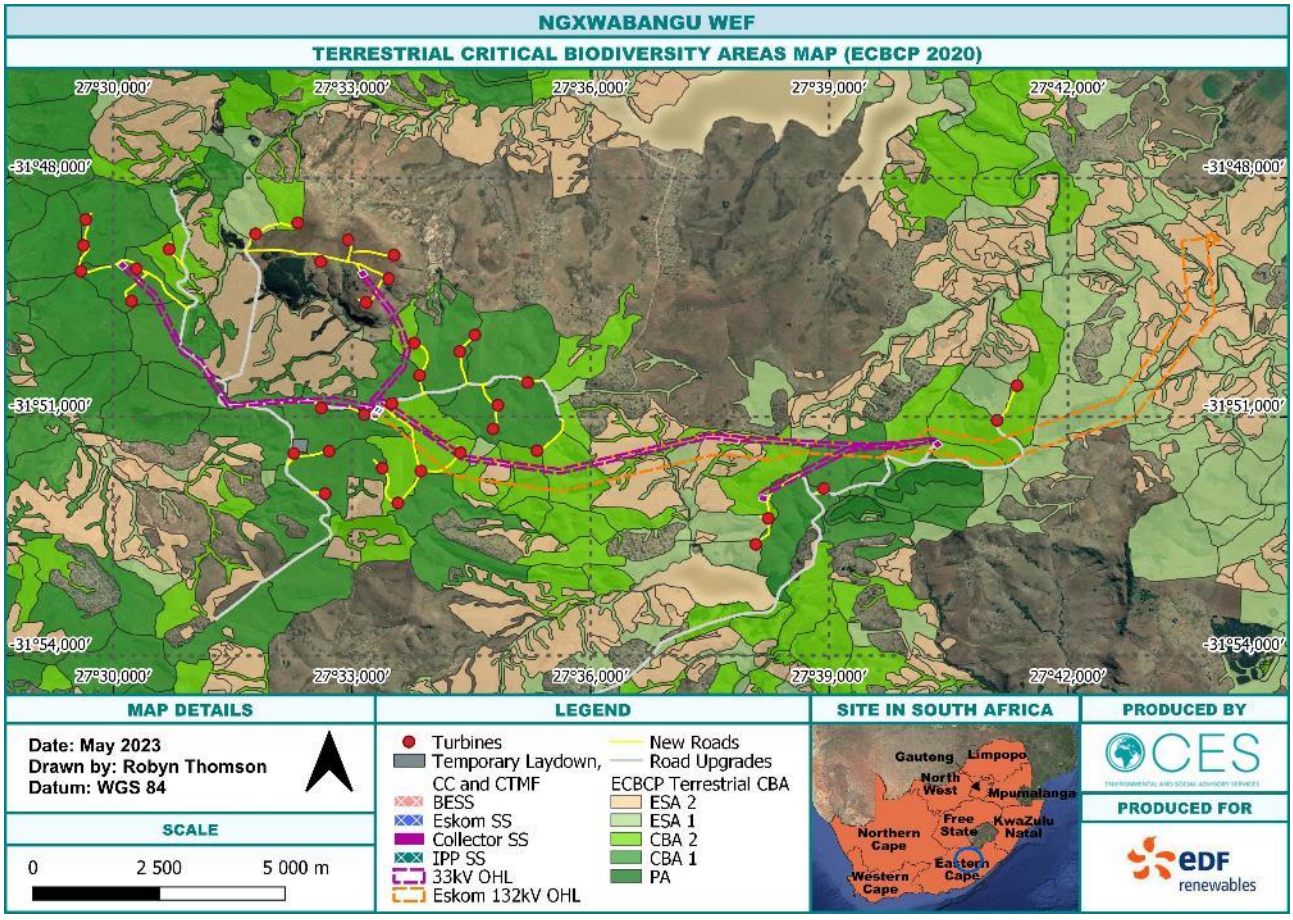


Figure 5-6: ECBCP (2019) Terrestrial CBAs

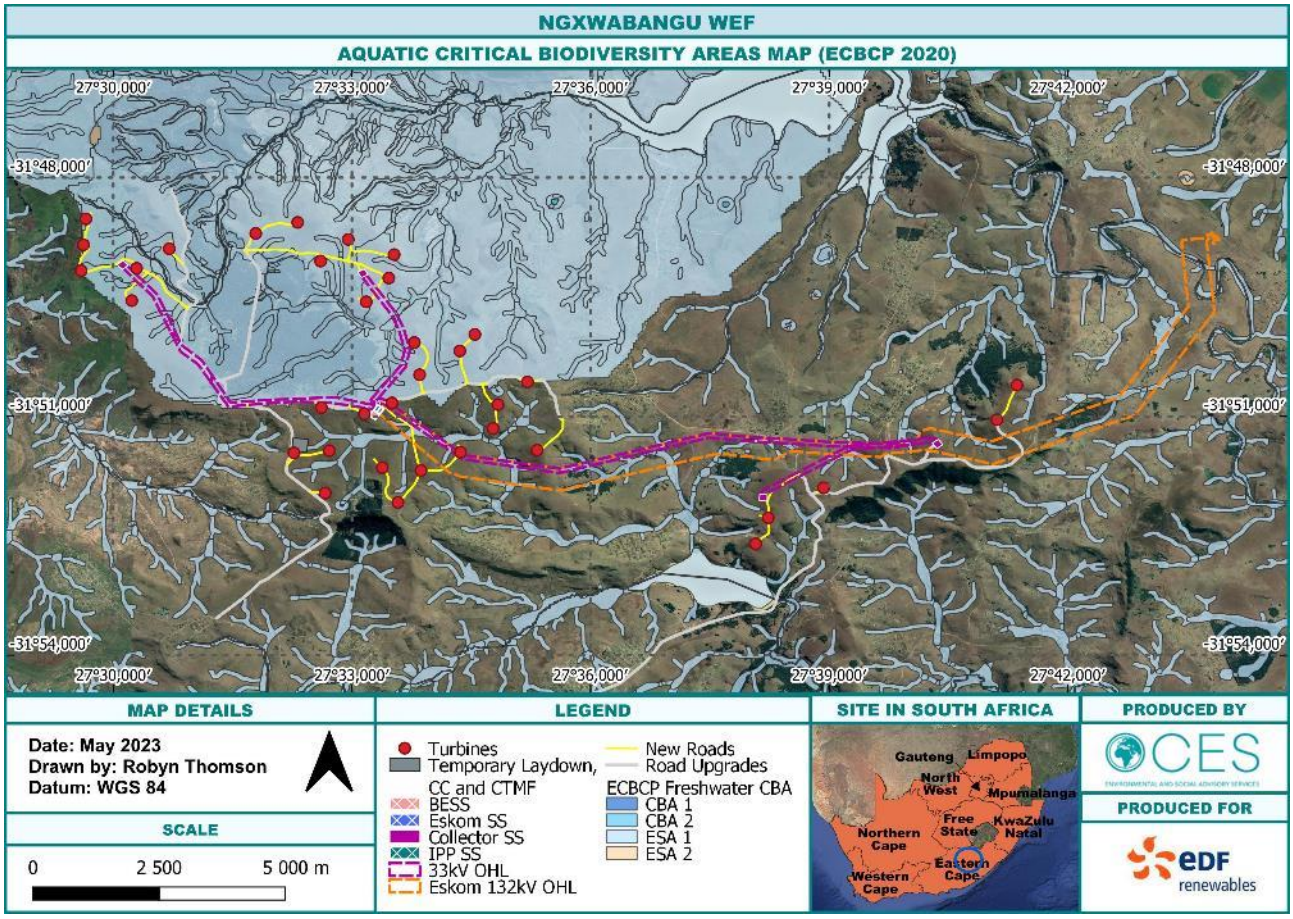


Figure 5-7: ECBCP (2019) Aquatic CBAs

CBA 1 areas are those which should be maintained in a near natural state. The ECBCP recognizes that some of the areas that are classified as CBAs were in a degraded state, in such cases those classified as CBA 1 areas, are areas which are said to be "important remaining (degraded) areas", where the area has little or no intact biodiversity remaining but is said to have potential to regain a CBA 1 status through rehabilitation. When related to the Biodiversity Land Management Classes (BLMCs), a degraded CBA 1 area needs to be maintained in a near natural state (landscape).

Whilst the CBA 1 categorised areas had areas with rocky outcrop, SCC, watercourses, and forest patches, sections in the Eastern section (lower portion of the project) had high invasion of Alien invasive species and were not in pristine condition. With that, one would not deem it as a CBA 1 as there is high invasion of Alien invasive species, which have altered the vegetation found in these areas.

CBA 2 areas should be managed to maintain the environment in a near-natural state. The proposed project area is classified as a CBA 2 (i.e. in a near natural state) varies from areas.

5.6 FAUNA

Amphibians and reptiles are well represented in sub-Saharan Africa. However, distribution patterns in southern Africa are uneven both in terms of species distribution and in population numbers (du Preez and Carruthers, 2009). Climate, centres of origin and range restrictions are the three main factors that determine species distribution. The eastern coast of South Africa has the highest amphibian diversity and endemicity while reptile diversity is generally highest in the north-eastern extremes of South Africa and declines to the south and west (Alexander and Marais, 2010).

5.6.1 HERPETOFAUNA

Herpetofauna include animals in the Classes *Amphibia* and *Reptilia*. The Eastern Cape Province is home to about one-hundred-and-seventy-seven (177) herpetofauna species, which includes fifty-seven (57) amphibian species and one-hundred-and-twenty (120) reptile species. Of these, approximately fifty-eight (58) species may occur within the study area. A total of seventeen (17) amphibian species and forty-one (41) reptile species were identified to potentially occur within the study area.

Of those identified in the Ecological Impact Assessment Report, five (5) amphibian species and sixteen (16) reptile species are Endemic, and two (2) amphibian species and seven (7) reptile species are Near Endemic. In addition, four (4) reptile species are protected by the Provincial Nature Conservation Ordinance (PNCO) (Act No. 15 of 1974), namely Leopard Tortoise (*Stigmochelys pardalis*), Eastern Cape Dwarf Chameleon (*Bradypodion ventral*), Southern Dwarf Chameleon (*Bradypodion ventral*), Cape Girdled Lizard (*Cordylus cordylus*), Rock Monitor (*Varanus albigularis*) and Water Monitor (*Varanus niloticus*). In terms of their Conservation/Threat Status, two species are Near Threatened, namely the African Bullfrog (*Pyxicephalus adspersus*) and Coppery Grass Lizard (*Chamaesaura aenea*). The likelihood of occurrence within the study area for these SCC is assessed in Table 3.3 of the Ecological Impact Assessment Report, Appendix D. None of the species identified in the report are listed as Threatened.

Consultation of the Animal Demography Unit (ADU) historical records indicates that 62 species of reptiles are likely to occur in the project site (QDS 3326 BA, 3326 BC, and 3326BD). None of these species are conserved under the IUCN and only the Southern African Python (*Python natalensis*) is listed as PROTECTED on the National Environmental Management: Biodiversity Act (NEMBA). However, all lizards and tortoises are listed as a SCHEDULE II species on the PNCO list and will therefore require permits for their removal. Please the Ecological Impact Assessment Report, Appendix D, which lists all of the reptilian SCC which are likely to occur within the study site.

5.6.2 MAMMALS

The ranges of forty (40) native mammal species overlap with the study area. The mammal species identified as potentially occurring within the study area were assessed against the Regional Red List (2016 and subsequent updates), and it was determined whether they are endemic, near endemic or not endemic, as well as their status in the PNCO (Appendix 2). Of these mammals, four (4) species are Threatened and three (3) are Near Threatened. Of the Threatened species, two (2) are Vulnerable, namely Spotted-necked Otter (*Hydrictis maculicollis*) and Black-footed Cat (*Felis nigripes*), and two (2) are Endangered, namely Mountain Reedbuck (*Redunca fulvorufula fulvorufula*) and Black Rhinoceros (*Diceros bicornis*). Near Threatened species include Grey Rhebok (*Pelea capreolus*), African Clawless Otter (*Aonyx capensis*) and White Rhinoceros (*Ceratotherium simum*). The Ecological Impact Assessment, Appendix D, lists the mammal SCC identified as Threatened or Near Threatened. Thirteen (13) species are protected by PNCO (Act No. 15 1974) and seven (7) by NEM:BA (2007). In addition, eight (8) species are Endemic and four (5) are Near Endemic (please refer to Appendix 2 of the Ecological Impact Assessment Report for species names).

During the Ecological Impact Assessment site investigation, no native mammals were observed. However, a large density of domestic cows within the study area was seen, which probably can be correlated with the extensive amount of grazing and footpath erosion taking place on site.

5.6.3 BATS

Inkululeko Wildlife Services were appointed as the bat specialists to conduct the pre-construction monitoring and were subsequently appointed to undertake the Bat Impact Assessment. The following section outlines the baseline findings of the monitoring.

Listed in Table 2 of the Bat Impact Assessment are 19 bat species which either were detected or potentially occur in the study region. Of the 19 listed species, five were recorded onsite during the six-month passive acoustic monitoring: Egyptian Free-tailed Bat (*Tadarida aegyptiaca*) Cape Serotine (*Laephotis capensis*) Natal Long-fingered Bat (*Miniopterus natalensis*) Little Free-tailed Bat (*Chaerephon pumilus*) Long-tailed Serotine (*Eptesicus hottentotus*).

The same five species, and calls of an unidentified Molossid species, were also recorded onsite during the IWS (2017) study, along with four others, namely, the Yellow House Bat (*Scotophilus dinganii*), the Lesser Long-fingered Bat (*Miniopterus fraterculus*), the Cape Horseshoe Bat (*Rhinolophus capensis*) and Geoffrey's Horseshoe Bat (*Rhinolophus clivosus*), which were not recorded during the additional six months of monitoring. During the Animalia (2017) study the Egyptian Free-tailed Bat, Cape Serotine, and Natal Long-fingered Bat were recorded, along with the Mauritian Tomb Bat (*Taphozous mauritianus*), which was not recorded during the 2021/22 monitoring.

Collectively, Animalia (2017) and IWS (2017 and 2022) have confirmed the presence of 10 bat species in the study region. Available species records and published distribution maps (Monadjem et al. 2020; African Chiroptera Report 2021) suggest that the Little Free-tailed Bat, Yellow House Bat, and Mauritian Tomb Bat have a low likelihood of occurrence in the study region. Yet calls most like these species were recorded onsite by IWS and/or Animalia, suggesting that the presence of these species in this part of the Eastern Cape was previously unknown/overlooked. Of the 10 confirmed bat species, most (six) have a HIGH risk of fatality from wind turbines, one has a MEDIUM-HIGH fatality risk, one has a MEDIUM fatality risk, and two have a LOW fatality risk (MacEwan et al. 2020a).

IWS regards the following recorded or potentially occurring bat species as having highest conservation priority:

- Swinny's Horseshoe Bat (*Rhinolophus swinnyi*): Nationally Vulnerable (Child et al. 2016) and endemic to South Africa where it occurs sparsely and in low numbers (Monadjem et al. 2020).
- Lesueur's Wing-gland Bat (*Cistugo lesu*euri): Endemic in South Africa to the Cape Fold and Drakensberg mountains (Monadjem et al. 2020; IUCN 2021-1).
- Cape Horseshoe Bat (*R. capensis*): Endemic to the southern edge of South Africa and possibly Namibia (Monadjem et al. 2020).
- Natal Long-fingered Bat (*M. natalensis*): known to roost in large numbers (sometimes hundreds or thousands of individuals) and to migrate hundreds of kilometres (Miller-Butterworth et al. 2003; MacEwan et al. 2016).
- Temminck's Myotis (*Myotis tricolor*): Known to roost in large numbers and migrate hundreds of kilometres in some cases (Monadjem et. al. 2020).
- Egyptian Rousette (*Rousettus aegyptiacus*): Known to roost in large numbers and migrate hundreds of kilometres (Monadjem et. al. 2020).
- African Straw-coloured Fruit Bat (*Eidolon helvum*): Globally and nationally Near Threatened. Known to roost in large numbers and migrate hundreds of kilometres (Monadjem et al. 2020).
- Of these, the Natal Long-fingered Bat and Cape Horseshoe Bat have been confirmed on site.

5.6.4 AVIFAUNA

WildSkies Ecological Services were appointed as the avifaunal specialists to conduct four (4) seasons of pre-construction bird monitoring. This monitoring took place over 24 months (2 years / 4 x 2 seasons), and they were subsequently appointed to undertake an Avifaunal Impact Assessment. The following section outlines the baseline findings of the monitoring.

A) SMALL TERRESTRIAL BIRDS

A total of 83 bird species were recorded on the Walked Transects on the site through the year. This included 732 records of 1 619 individual birds.

The most abundant species on the site were not surprisingly all species already known to be common in the area, such as: Cape Longclaw *Macronyx capensis*; Red-capped Lark *Calandrella cinerea*; and Cape Crow *Corvus capensis*.

One of the species recorded by this method is regionally Red Listed (Taylor *et al*, 2015), the Yellow-breasted Pipit *Anthus chloris* (Vulnerable). A number of the recorded species are either endemic or near endemic to South Africa or endemic to South Africa, Lesotho and Swaziland. These include: Sentinel Rock Thrush *Monticola explorator*; Eastern Long-billed Lark *Certhilauda semitorquata*; Buff-streaked Chat *Oenanthe bifasciata*; Ground Woodpecker *Geocolaptes olivaceus*; Yellow-breasted Pipit; Cape Rock Thrush *Monticola rupestris*; Pied Starling *Spreo bicolor*; Cape White-eye *Zosterops virens*; Drakensberg Rockjumper *Chaetops aurantius*; Greater Double-collared Sunbird *Cinnyris afer*; Southern Double-collared Sunbird *Cinnyris chalybeus*; Cape Weaver *Ploceus capensis*; Karoo Prinia *maculosa*; Sickle-winged Chat *Cercomela sinuata*; and Orange-breasted Bushshrike *Telophorus sulfureopectus*.

The small terrestrial bird community on site is as expected for a grassland area of this nature. However, it is noteworthy that Yellow-breasted Pipit occurs here. Although not recorded by walked transects, we have also recorded Rudd's Lark *Heteromirafra ruddii* (Endangered) in good abundance on site. The presence of populations of these two species is an indication of the good health of this high-altitude grassland on site. These two species are discussed in more detail in the Avifaunal Impact Assessment Report, Appendix D.

By comparison, the first year of monitoring on the Ngxwabangu site (WildSkies, 2016) recorded a total of 45 small bird species, including 570 individual birds from 337 records. Of the species recorded, one was regionally Red Listed (Taylor *et al,* 2015), the Yellow-breasted Pipit (Vulnerable – 2 birds recorded in spring). The most abundant species recorded on site were Red-capped Lark, followed by African Pipit *Anthus cinnamomeus*, Cape Longclaw and Plain-backed Pipit *Anthus leucophrys*.

At the Ncora site (WildSkies, 2013), which has now been incorporated into this proposed WEF, walked transects were not done. However due to the Rudd's Lark and Yellow-breasted Pipit records in the broader area from the first Southern African Bird Atlas Project (SABAP1 - Harrison *et al,* 1997), focused searches were made for these species on site. In the case of Rudd's Lark (a Critically Endangered species which would have been a significant risk to this project), follow up was made to establish who exactly recorded the species during the atlas project, and where exactly. The record was made by Mr David Allan (currently ornithologist at Durban Museum). Mr Allan recorded a single Rudd's Lark on the small plateau that was previously included in the proposed Ncora WEF site but subsequently ruled out during the EIA phase (personal communication Mr D Allan, 2013). Several years later Mr Carl Vernon apparently recorded the species at that same site. Although this sighting was some distance from the site currently studied, it is conceivable that the species could occur on the current site too. It was therefore seen as imperative to establish whether these species occur on site or not. Extra effort was invested to survey the site for these species by walking, but these species were not recorded on site during the course of this programme.

The most significant difference between monitoring periods in this set of avifauna is the strong presence more recently of Yellow-breasted Pipit (recorded fleetingly previously) and Rudd's Lark (not recorded originally). Both species can be difficult to detect when not breeding, and it is possible that the original monitoring did not sample the breeding peak (November) adequately. Alternatively, these species may be showing a recovery and range expansion in the area.

B) LARGE TERRESTRIAL BIRDS

A total of 11 large terrestrial and raptor species were recorded across the five drive transects totalling 222 kilometres on the site through the year. Although not a target species for this method, Rudd's Lark was also recorded by this method. The full data set includes 149 individual birds from 45 records. The data for the full

year collectively are shown in Table 3, whilst Appendix 6 has the breakdown per site visit (please see the Avifaunal Impact Assessment, Appendix D). In each case the species' regional and global Red List status and endemism is shown. Seven species are regionally Red Listed: Cape Vulture, Grey Crowned Crane *Balearica regulorum*; and Rudd's Lark are Endangered; Secretarybird and Verreaux's Eagle are Vulnerable; and Denham's Bustard and Lanner Falcon are Vulnerable. The most abundant species recorded by this method was the Cape Vulture followed by Black-winged Lapwing *Vanellus melanopterus* and Jackal Buzzard. Cape Vulture and Black-winged Lapwing are gregarious species occurring in groups or flocks, whilst Jackal Buzzard is a solitary (or at most in pairs) species.

Earlier monitoring at Ngxwabangu (WildSkies, 2016) recorded a total of 14 relevant bird species across the four seasons. This included 125 records of 343 individual birds. Several of these species are Red Listed species including: Black Harrier (Endangered); Cape Vulture (Endangered); Denham's Bustard (Vulnerable); Grey Crowned Crane (Endangered); Lanner Falcon (Vulnerable); Secretarybird (Vulnerable); and Southern Ground Hornbill *Bucorvus leadbeteri* (Endangered). The Southern Ground Hornbill is probably the least expected large bird species recorded on this site, as these birds are quite scarce throughout most of the former Transkei. The most abundant species overall was Cape Vulture, followed by White Stork *Ciconia Ciconia* and Jackal Buzzard. Cape Vulture and Jackal Buzzard were also the only two species recorded in each of the four seasons. This data needs to be used cautiously, since the drive transects extend beyond the site boundary, as they aim to measure abundance of these species in the broader area. Amur Falcon *Falco amurensis*, Steppe Buzzard and White Stork were all recorded only in the summer site visit. Most species showed higher abundance in summer than the other seasons.

At the Ncora site (WildSkies, 2013), which has been incorporated into the Ngxwabangu WEF site, a total of 6 target bird species were recorded by this data collection method. The Cape Vulture was most frequently recorded, and with the most individuals, followed by Egyptian Goose *Alopochen aegyptiaca* and Jackal Buzzard.

The most significant difference between the two monitoring periods is that Southern Ground Hornbill was recorded in 2016 at Ngxwabangu, and not again more recently, and that Black Harrier was recorded originally but not recently. The hornbill is a resident species, and we wonder whether the family group still exists somewhere in the broader area. The harrier would typically pass through the area at times, and has been recorded by other methods recently on site (WildSkies, 2022).

The proposed Ngxwabangu WEF is **NOT** situated within 50 km of any of the South African Important Bird and Biodiversity Areas (IBAs).

5.7 Rivers, Watercourses and Drainage Lines

The project area falls within four (4) quaternary drainage areas (S20D, S50E, S50F, S50G) of the Mzimvubu to Tsitsikama Water Management Area (WMA 7). The overall aquatic sensitivity of the proposed site is classified as VERY HIGH in the Screening Report as the site falls within a Strategic Water Source Area (SWSA) and traverses' numerous wetlands. However, it should be noted that analysis of the map of the relative aquatic biodiversity theme sensitivity within the Screening Report generated for the study area indicates that only the northern portion of the Ngxwabangu WEF falls within a strategic water source area (classified as HIGH sensitivity) whilst the remainder of the site falls within an area of LOW sensitivity.

The WWF and CSIR (2017) identified twenty-one (21) Strategic Water Source Areas for surface water (SWSA-sw) which covered 8% of South Africa and supplied 50% of the mean annual runoff, expanding on the work of the National Freshwater Priority Areas (NFEPA 2011), which identified high-water yield area and high groundwater recharge areas.

SWSAs are defined as areas of land that either: (a) supply a disproportionate quantity of mean annual surface water runoff in relation to their size and so are considered nationally important; or (b) have high groundwater recharge and where the groundwater forms a nationally important resource; or (c) areas that meet both criteria (a) and (b). SWSAs are in high rainfall areas and contribute to sustained river flows, which are important for supporting people and communities who depend directly on rivers for their water, especially during the dry season and droughts. However, only 11% of SWSAs receive formal protection.

The north-eastern portion of the Nxgwabangu WEF falls within the Eastern Cape Drakensberg SWSA-sw. Considering the benefit SWSAs provide, it is imperative that development plans consider these areas to maintain and increase the benefits they provide.

The National Freshwater Ecosystem Priority Areas (NFEPA) (2011) and the NBA (2018) Inland Aquatic Assessment only identifies a total of eight (8) small wetlands within the project area. However, the site visit confirmed that numerous extensive wetland systems occur within the project area. These have been delineated and mapped by the aquatic specialist (Aquatic Impact Assessment, Appendix D). Some of these systems have been severely eroded, most likely due to impacts such as grazing and trampling by livestock.

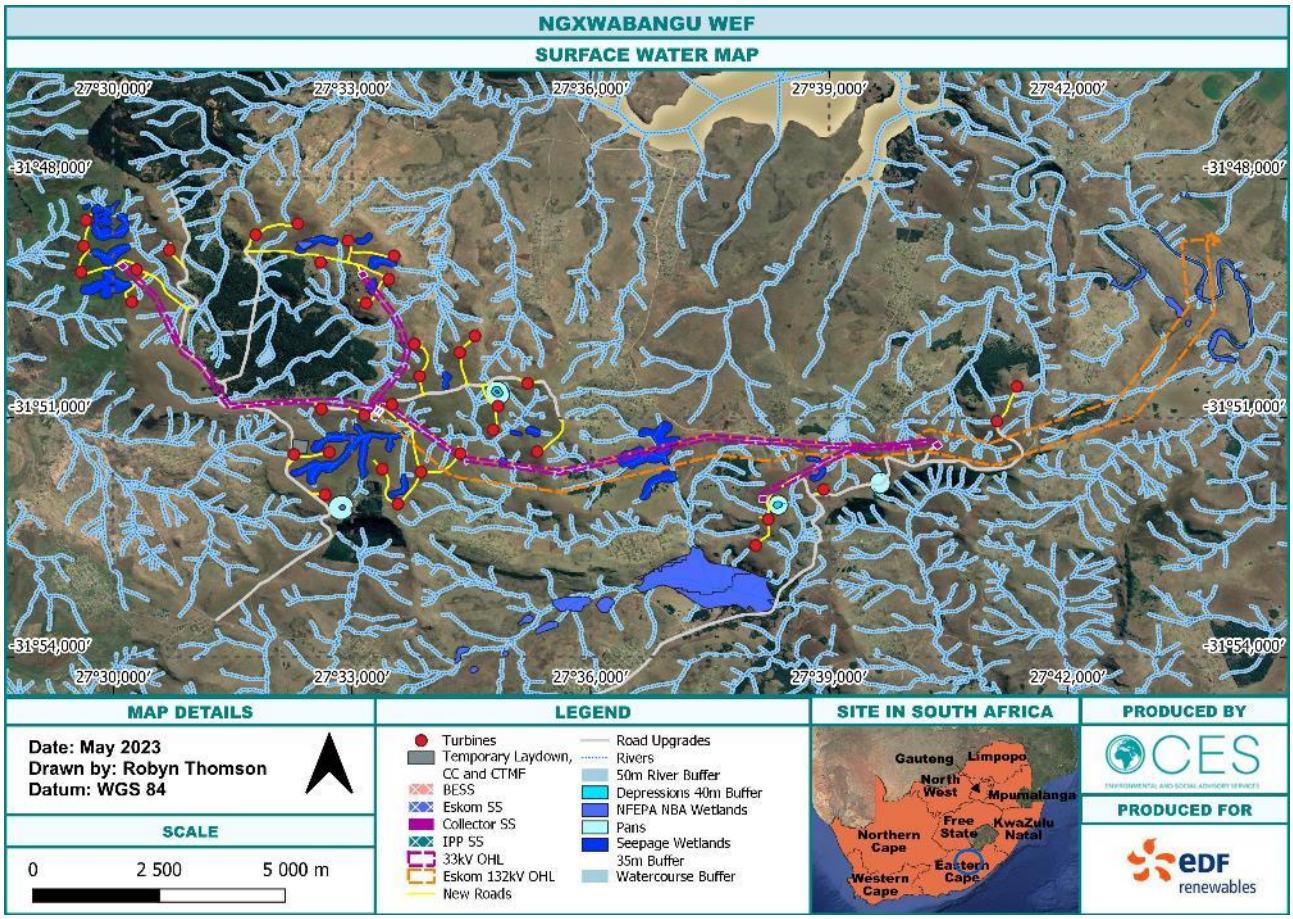


Figure 5-8: Surface Water Map of the Ngxwabangu WEF site and surrounding areas.

5.8 POPULATION, INCOME AND EMPLOYMENT PROFILE (AS PER SEIA)

The Intsika Yethu Municipality falls within the Eastern Cape and collectively account for 2% of the population, and 2.15% of the households in the province. During the years 2009-2019, The Instika Yethu Municipality and the designated study area has experienced an annual population decline of -1.30%. This is mostly likely

attributed to local youth migrating in search for employment and better opportunities. The disposable average monthly income of households in Intsika Yethu municipality was R4,419 while the study area had a lower figure of R3,384. This was significantly lower than both that of the Chris Hani District (R6,892) and the Eastern Cape (R9,234) during the same period.

The lower average disposable household income in the study area and the rest of the local municipality suggests that the area is a low income, low growth area even in the context of the Eastern Cape.

The employment profile of Intsika Yethu municipality below highlights that the municipality only represents 1.02% of the employed population in the Eastern Cape. The unemployment rate and labour force participation rates in Intsika Yethu municipality (Unemployment rate: 43.3%; Labour force participation rate: 30.0%) and the study area (Unemployment rate: 46.3%; Labour force participation rate: 23.2%) in particular, are also notably worse than that of the Eastern Cape (Unemployment rate: 37.9%; Labour force participation rate: 45.8%).

The relatively high unemployment rate and lower labour force participation relative to the provincial and district averages further suggests that the Intsika Yethu municipality and the study area is subject to outward population migration due to the limited number of formal employment opportunities available within the area.

5.9 Education Profile (as per SEIA)

The level of education provision within an area is one of the main determinants when it comes to a region's ability to achieve long-term sustained, positive economic growth. The provision of education alone, however, does not necessarily ensure that this local economic growth will occur. Equally important is ensuring that this education provision is of a sufficient quality to meet both the communities and the broader economy's needs.

It is evident from Table 3.3 on page 30 of the SEIA that the skill level of the population, as measured by educational attainment, is notably lower in the local municipality and specifically the study area compared to the rest of the Eastern Cape with the study area having 53.6% of the population having no schooling. The high proportion of the population that have "no schooling" suggests that the area has high levels of poverty and limited financial means and resources for education attainment. The nearest town being Cofimvaba also poses certain challenges to attending school such as difficulty getting to school with poor road conditions and lengthy distances to travel. In addition, limited economic opportunities often cause people to choose between attending school and searching for employment in order to receive an income. Thus, this may also be a further suggestion as to why there is a high proportion of the population that fall under the "no schooling" category in the study area.

5.10 Access to Basic Services (as per SEIA)

National legislation as well as a municipality's basic services policy recognises the need to prioritise access to basic services (water, sanitation, refuse removal and electricity) to all residents of an area including the poor and indigent households even if they cannot afford to pay for the service. The intention of this legislation and respective policies are to ensure that households enjoy the benefits of a decent standard of living in line with the requirements of national legislation.

In 2019, 7.5% of households in the Intsika Yethu municipality had access to piped water, which lies far below the provincial average of 48.1% while the study area only had 5.8% of households with access to piped water. The low level of water access in the area can be attributed to lack of institutional intervention, appropriate budget allocations, high levels of water infrastructure damage as well as environmental impacts such as the drought crisis in the Eastern Cape, with certain regions being severely more affected than others. It should be noted that this figure does not speak to the quality and reliability of this access.
Electricity access is exceptionally high in the Intsika Yethu municipality and the study area specifically. This was evident by the fact that most (91.7%) households in the study area use electricity as their primary means of lighting.

Access to sanitation in the area is particularly low in comparison to other parts of the local municipality and the province at large. This is attributed to the fact that the study area is classified as rural and outside of the urban edge of any formal towns where formalised sewer systems are in place. The majority of the population from the area either have no access to adequate sanitation and still utilise pit latrines.

In terms of access to refuse removal, the study area and Intsika Yethu municipality at large represent household populations that have the least suitable access to this service. The study area indicates that 0.7% of household populations have access to refuse removal, while Intsika Yethu municipality at large accounts for 3.6% of household populations with suitable access to refuse removal. This may be the case due to the fact that refuse removal is always restricted to formal urban towns. Provided that this is the mandate of the local municipality, limited budgets however, preclude the roll-out of such services. It should also be noted that even in the event of such an initiative occurring, the lack of land tenure in former homeland areas also preclude the possibility of formal household rates being charged.

5.11 Economic Profile (as per SEIA)

The following subsection outlines the economic profile at a national as well as a provincial and local municipal level.

Nationally, South Africa's Real Gross Domestic Product (GDP) for the first quarter of 2022 grew by 1.9% after the 2019 and 2020 lockdown restrictions of the Covid-19 pandemic. However, in the second quarter of 2022, unexpected natural disasters such as the floods that occurred in Kwa-Zulu Natal and the ongoing loadshedding crisis, resulted in a 0.7% decline (Statistics South Africa, 2022). The third quarter of 2022 is expected to experience contraction, a contributing factor being that of stage six loadshedding impacting the economic growth potential in addition to the weakening of the local currency against the US dollar and other major currencies. According to Investec (2022), several days with stage six loadshedding in one year will not hinder economic growth nor South Africa's credit ratings but the persistence thereof will have a rather detrimental impact on the country's economic growth and credit ratings (Bishop, 2022).

5.11.1 The Impact of COVID-19 on the South African Economy

The Covid-19 pandemic resulted in tremendous job losses and has only made a slow recovery to bounce back from the loss. Approximately less than 40% of employment losses recovered. Prior to the outbreak of the pandemic, South Africa's economic climate was already poor with the country as the country found itself in a recession with the effects of the pandemic only worsening the situation. During the level five lockdown when most economic activity was put on a standstill, the economy lost a total of 2.2 million jobs, representing a decrease of 13.6% in total employment (World Bank Group, 2021).

South Africa suffered from the impact of a huge contraction during April, May and June 2020. GDP fell by just over 16% between Q1 and Q2:2020, resulting in an annualised growth of rate of -51%. In 2020, Q2 experienced the biggest decline in GDP since 1960 (Statistics South Africa,2020). Six of the ten industries recorded declines in in production in the third quarter of 2021 with sectors such as agriculture, trade and manufacturing being impacted the hardest (Statistics South Africa, 2021).

It has taken the country almost two years to recovery from the effects of the Covid-19 pandemic. In comparison to other countries, South Africa's recovery has been thought of as sluggish. However, there has been a light of positivity as the country's GDP expanded by 1.9% in the first quarter of 2022 (Statistics South Africa, 2022). This quarter was the second consecutive quarter of upward growth. As a result, the economy has found itself to be at pre-pandemic levels, with the country's real GDP being just higher than before the pandemic hit South African shores.

With lockdown restrictions having now been removed, there has been mounted pressure to restore the economy. The low levels of productivity brought about by the pandemic has had an impact on the country's competitiveness and overall economic performance, which has made it challenging to stimulate economic growth. Stable supply of electricity becomes crucial during this time in order to for productivity levels to increase and for job creation to expand in order for the economy to grow. The South African energy provision system is currently and has in the past decade been, notoriously unreliable which has had a major impact on investor confidence and the overall development trajectory of the country.

5.11.2 THE SOUTH AFRICAN ELECTRICITY SUPPLY

South Africa's energy mix is largely focused on the use of non-renewable fossil fuels. The DMRE, previously known as the Department of Energy (DoE), notes that 83% of electricity production in South Africa is supplied by coal followed distantly by 6% pumped storage, 5% gas, 4% nuclear, 2% hydroelectric and 0,2% wind (DoE, 2019). It is noted by the DoE that renewables are the future of energy generation in South Africa especially as the costs of generating electricity through traditional means increases (DoE, 2019).

South Africa is also considered to be one of the top 15 largest emitters of greenhouse gases in the world and the largest in Africa (Steenkamp, 2022). Despite the introduction of the carbon tax, CO_2 emissions are still extremely high as a result of the heavy reliance on coal to produce energy. At the recent international climate change conference (COP26) that was held in Glasgow in November 2021, South Africa raised its targets for greenhouse gas emissions. The European Union pledged funding to South Africa amounting to R131 billion. The purpose of this climate financing is to assist the country drive out the use of fossil fuels and introduce renewable energy so that emission reduction targets can be met by the year 2050 (Steenkamp, 2022).

Globally, there has been an increasing shift towards the responsible utilisation of non-renewable energy sources and towards sustainable and non-polluting methods of energy production. Despite the shock of the Covid-19 pandemic, renewable capacity additions in 2020 expanded by more than 45% from 2019 with an exceptional 90% rise in global wind capacity additions leading the expansion. The significant level of renewable energy capacity generations is expected to be maintained with 280 GW becoming operational in 2022 with the additional expectation that renewable energy is to account for 90% of total global power capacity increases between 2021-2022 (IEA, 2021).

South Africa is regarded as a prime candidate for increased use of renewable energy with abundant natural resources of sun and wind. The further development of renewable energy will align to the current shift in

international trends and align well with the available resources of the country. Provided there is an increasing cost of traditional fossil fuels, renewable energy stands to be a feasible option. Currently, South Africa is rated as the 12th most attractive area for investment for renewable energy (DoE, 2019). A key milestone for the sector in South Africa is the Renewable Energy Independent Power Producers Procurement Programme that has attracted investment amounting to R209.7 billion of which R41.8 billion is foreign investment. The success of the programme has resulted in the uprising of SME concentration in the sector (DoE, 2019).

The South African government has identified the green economy as one of the 12 job drivers that has the potential to significantly contribute to the country's current unemployment crisis. As many as 300 000 jobs could be directly created in areas of natural resource management and renewable energy construction (DoE, 2019).

Additionally, the supply of electricity in South Africa is currently exceptionally constrained. Load shedding in South Africa began in 2007 as a result of insufficient electricity generating capacity by the government owned national power utility, Eskom. The advent of load shedding has brought numerous direct economic impacts, indirect economic impacts and social impacts to South Africa.

These costs are associated with losses to productivity and limitation of growth for companies and as a result limit the growth of the country (Goldberg, 2015). Load shedding thus threatens jobs, economic recovery, and the livelihood of many South Africans around the country.

Local research undertaken by government agencies has also noted the need for change in the electricity industry. NERSA (NERSA, 2020) has examined the electricity supply industry challenges and possible solutions for those challenges and has maintained that continued price increases for electricity is unsustainable as it reduces demand. The increase in electricity prices has led to an increase in export of un-beneficiated ore which is likely to increase as the electricity price increases (NERSA, 2020). It has also been noted that there has been a reduction in export volumes of minerals which is likely a result of the increased price of electricity and unstable electricity supply. It has also been noted that the negative trend in exports mimic the GDP growth trends, which seems to be inversely proportional to electricity prices (NERSA, 2020). NERSA has also noted that electricity price is a significant cost driver for some sectors. The increase in electricity cost has a greater impact on some sectors such as the metals, steel and mining industry and less of an impact on other industries such as the transport industry.

New energy trends have also been noted by NERSA (NERSA, 2020). Their position is that the obligation to supply the majority of domestic, commercial, and small industries energy (day load) should be removed from the Eskom and be supplied by renewable energy IPP sources (NERSA, 2020). It can thus be deduced that at a national level any additional energy production which is sustainable, and renewable would improve energy security, further South Africa's goals towards international agreements, provide employment and assist in improving investor confidence in the country.

5.11.3 REGIONAL ECONOMIC PROFILE

The GVA (Gross Value Added) of Intsika Yethu was R2.5 billion in 2021 (constant prices), which collectively accounts for approximately 0.8% of the Eastern Cape economy's total GVA for the same period and contributing approximately 10% to the Chris Hani district's total GVA. Instika Yethu municipality is evidently reliant on its community services sector for formal employment with this sector's GVA contribution representing 42.8% of the total output of the local economy.

Over the last ten years, the Compounded Annual Growth Rate (CAGR) of Intsika Yethu's economy was 1.3%. The local economy is non-productive and heavily reliant on government resources and social services. The largest private sectors locally are the trade and finance sectors. Most of the businesses in these sectors are represented by large national retailers and wholesalers as well as the banks that have branches in the area. The almost non-existent manufacturing and agricultural industries indicate that there is little to no value addition taking place and poor upstream and downstream economic linkages between these industries. As indicated in Table 3.7, the finance and business sector has grown by 4.0% making it the best performing sector over the last ten years.

Electricity, gas and water only contributes a small percentage (1.6%) to the economy of Instika Yethu, however, some of these industries have been strained, especially water. This sector in the area is considered to have potential for further development and actively seeks such investment in order to assist with the diversification of energy as well as generating employment, therefore, new developments in this field would likely increase the contribution of the utilities sector to the GVA. According to the Instika Yethu local municipality's LED strategy, the utilities sector is the least significant sector in terms of GVA contribution and employment therefore, investment in this industry would see improved performance from supplier related sub-industries such as manufacturing, trade, construction and finance.

As indicated by Table 3.8, page 37 of the SEIA (Appendix D), the transport and communication sector has experienced a significant decline (-3.3%) in terms of its employment levels between 2011 and 2021. This drastic decline may have been exacerbated by the fact that this sector might have been impacted the most during the early stages of the COVID-19 pandemic with the strict lockdown restrictions and closed borders.

Secondary sectors such as the utilities (2.6%) and agriculture (2.3%) sectors experienced positive employment growth between 2011 and 2021 for the Intsika Yethu municipality, however this was off a very small base.

5.12 SYNTHESIS (AS PER SEIA)

The socio-economic profile indicates that Intsika Yethu municipality is faced with a number of inherent and growth inhibiting socio-economic issues. The low education levels and, as a consequence, negatively impacts the type of industries and sectors that present themselves for realistic investment. In addition, the low levels of household income and high unemployment rates mean that it is likely that the next generation of workers in the Instika Yethu municipality will be largely unskilled. The decline in the area's population growth also negatively affects the local economy of the area, as the child and older persons are cohorts make up the majority of the population.

To have a significant and sustainable impact on the socio-economic characteristics of Intsika Yethu and the study area in particular, industries which are labour intensive, and that require unskilled workers should be prioritised particularly in the utilities, construction and agriculture sectors as these sectors have contributed significantly to the region's employment over the last decade. Additionally, skilled labour from outside the area would initially have to be brought into the area due to the existing low skills levels.

The economy of both Intsika Yethu is dominated by the community services sectors in terms of both economic output and employment. Other sectors contributing to employment in the municipality are the finance and business services and utilities sectors. As such, related developments in these respective sectors are likely to have a strong positive impact on the unemployment and low-income levels situation in the

municipality. Interventions are needed for sectors that indicate slow and low growth. Improvement in these sectors in terms of investment and skills development will stimulate economic growth and ultimately, result in a healthier economic climate for the area. The increased economic growth will lead to a decrease in the poverty and unemployment levels currently experienced by the Intsika Yethu municipality and study area in particular.

6 DESCRIPTION OF THE ENVIRONMENT: NATIONAL SCREENING TOOL

The Site Sensitivity Verification Report (this chapter) has been prepared in order to comply with the requirements as stipulated in GNR 648 (2019), which outlines the procedures to be followed for the assessment and minimum criteria for reporting of identified environmental themes in terms of section 24(5)(a) and (h) of NEMA when applying for environmental authorisation. The initial site sensitivity verification must be undertaken by an environmental assessment practitioner or registered specialist with expertise in the relevant environmental theme being considered.

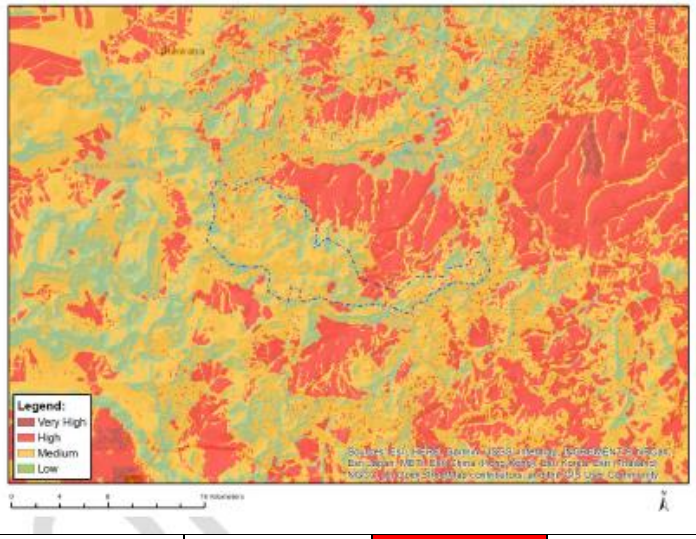
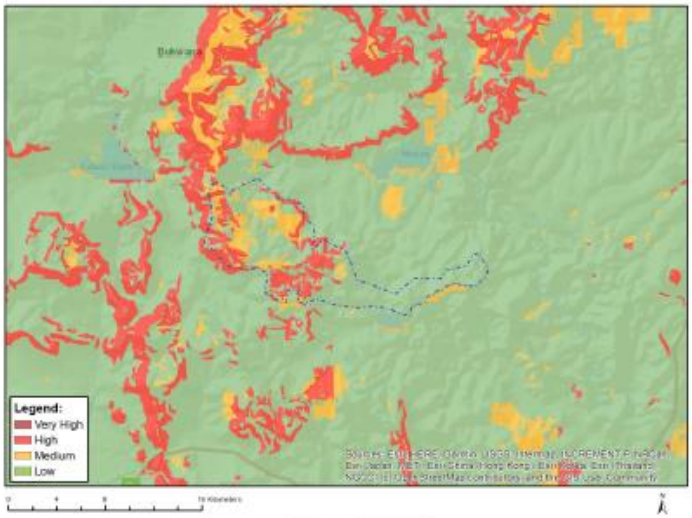
Site sensitivity was verified via a desktop analysis, including the use of satellite imagery as well as an on-site inspection. The objective of the on-site inspection is to ascertain whether the land use and environmental status quo versus the environmental sensitivity, as identified on the national web based environmental screening tool, are aligned or not. The current section is presented in line with the requirements of the Site Sensitivity Verification Requirements (GN 320, March 2020).

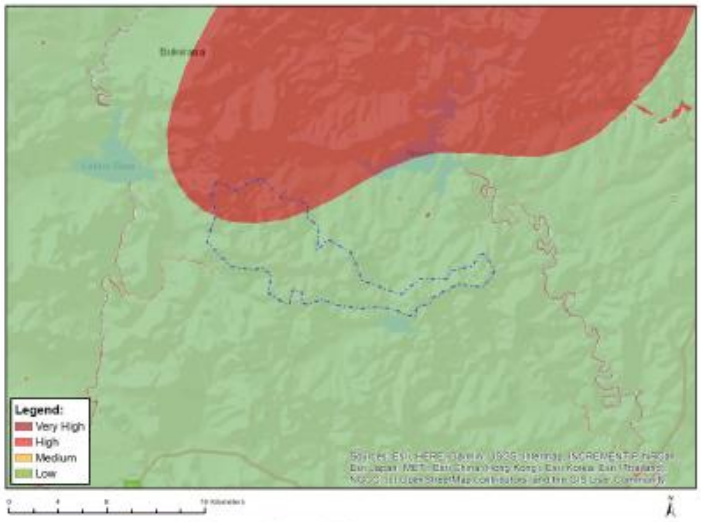
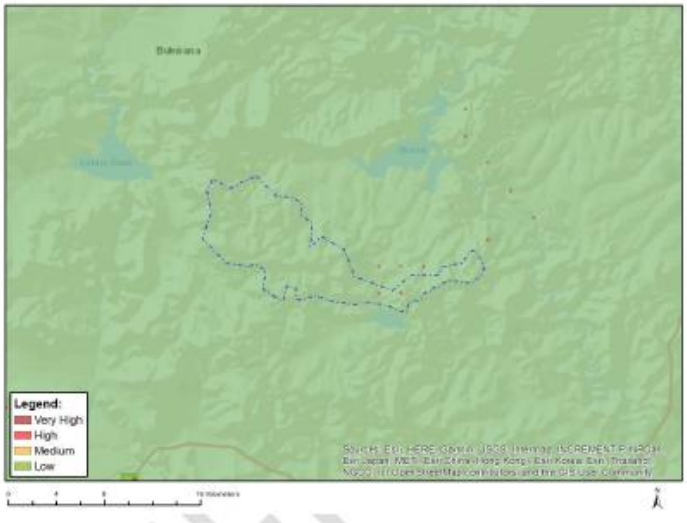
6.1 DFFE SCREENING TOOL ASSESSMENT

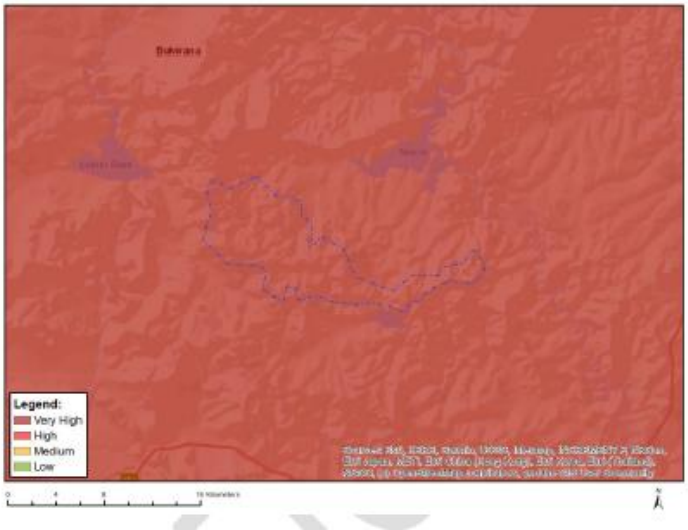
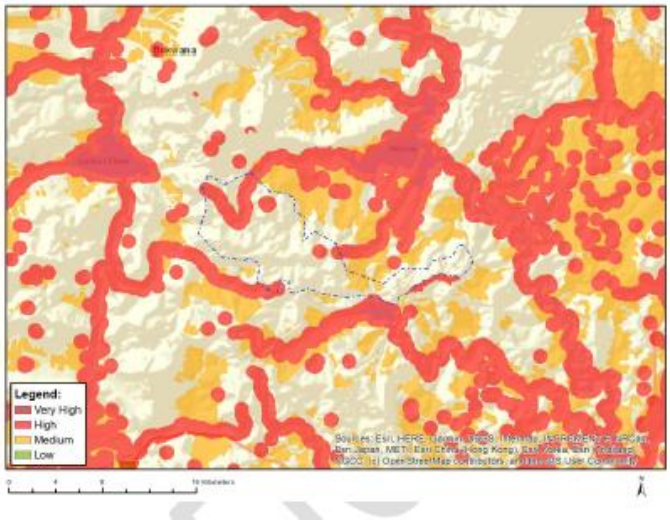
According to the DFFE Screening Tool Report, the specialist studies listed in the table below are required for the BA Process for the proposed Ngxwabangu WEF. The classification theme is as follows:

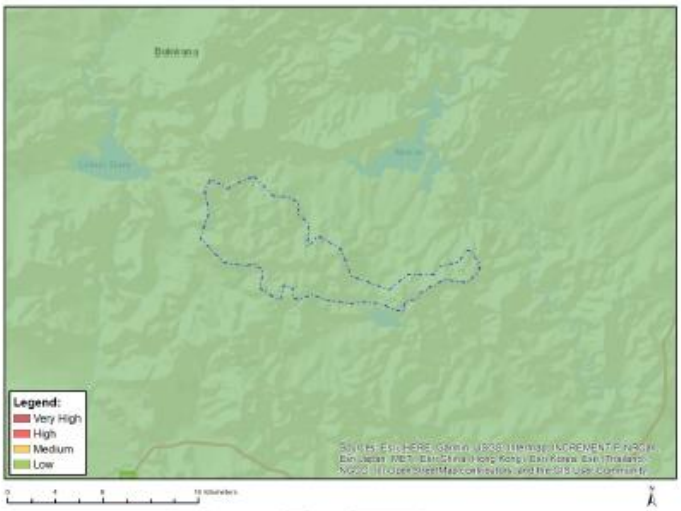
Table 6-1: DFFE online screening tool recommended specialist assessments

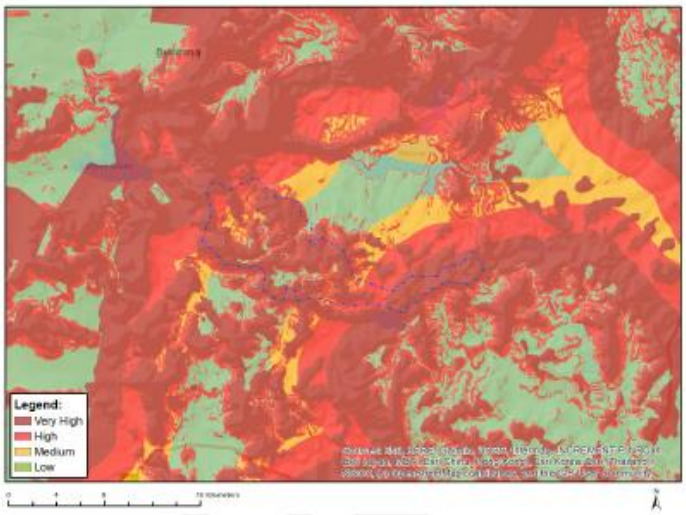
Screening Tool Recommended Specialist Assessment	Screening Tool Themes	Sensitivity Classification of Theme	Specialist Input Obtained Y/N	Motivation
Socio-Economic Impact Assessment Ecological Impact Assessment	Relative Agriculture Theme	**HIGH**	Y	The majority of the site is rated as medium sensitivity, with a section between the two WEF clusters classified as high sensitivity. This section does not include WEF infrastructure. In order to determine the impact of the proposed Ngxwabangu WEF on the existing landuse (subsistence crops and grazing) a Socio-Economic Specialist was appointed to undertake a full SEIA for the Ngxwabangu WEF. This specialist was involved in interviewing communities to understand the landuse of the local communities and the effect that the proposed WEF would have on these activities. The Ecological Impact Assessment has also assessed the site in terms of landuse, erosion and other biodiversity impacts in order to ensure that the existing impacts are contained and has provided mitigation measures to ensure that landuse practices are minimally impacted by the proposed development.

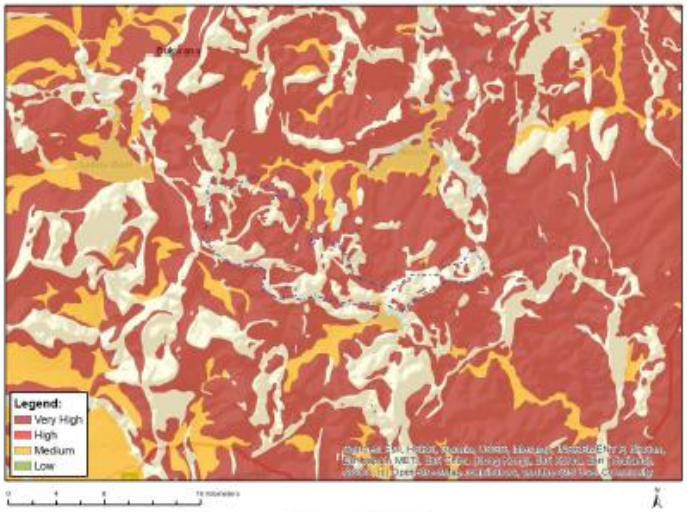
Screening Tool Recommended Specialist Assessment	Screening Tool Themes	Sensitivity Classification of Theme	Specialist Input Obtained Y/N	Motivation
MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY 				
Ecological Impact Assessment Bat Impact Assessment Avifaunal Impact Assessment	Relative Animal Species Theme	**HIGH**	Y	The assessment of the Animal Species forms part of the Terrestrial Biodiversity (Ecological) Impact Assessment, which was undertaken by a suitably qualified faunal specialist. In addition to this it is important to note that the primary HIGH sensitive rating is due to avifauna. With this in mind, this theme is also relevant to the Avifaunal Impact Assessment. The Animal Species Theme is also relevant to the Bat Impact Assessment.
MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY 				
Aquatic Impact Assessment	Relative Aquatic Biodiversity Theme	**HIGH**	**Y**	An Aquatic (River and Westland Ecosystem) Specialist was appointed to undertake a full Aquatic Impact Assessment for the larger site area of the Ngxwabangu WEF.

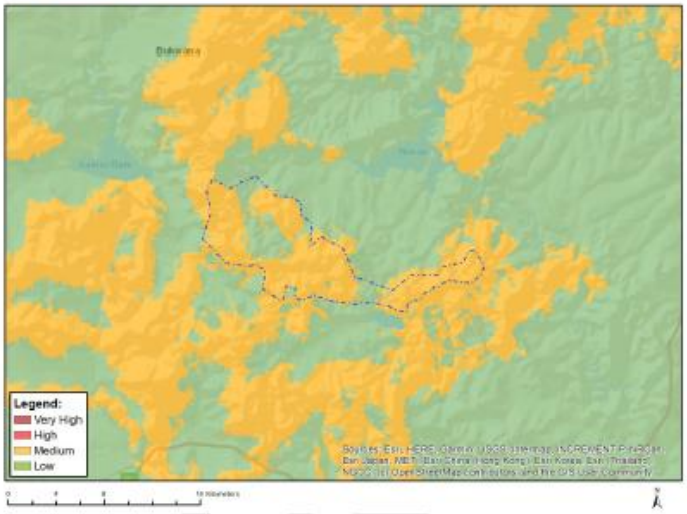
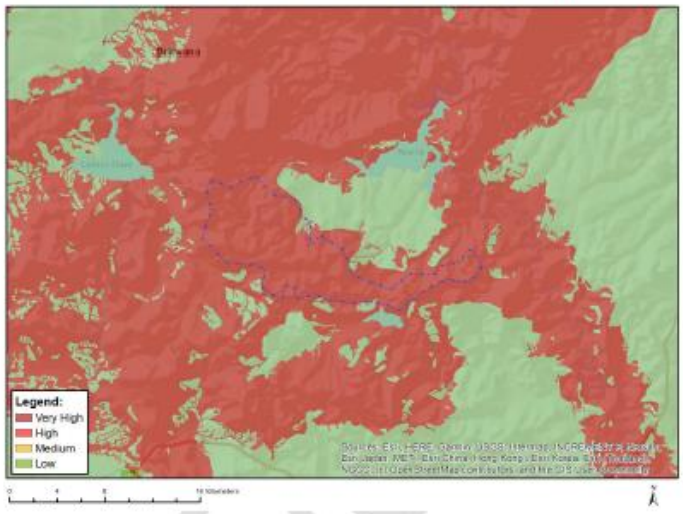
Screening Tool Recommended Specialist Assessment	Screening Tool Themes	Sensitivity Classification of Theme	Specialist Input Obtained Y/N	Motivation
MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY 				
Archaeological and Cultural Heritage Impact Assessment	Relative Archaeological and Cultural Heritage Theme	**LOW**	Y	Although the sensitivity classification is low for this theme, a Heritage Specialist was appointed to undertake a full Heritage Impact Assessment (HIA) for the larger site area, for the Ngxwabangu WEF. Prior to undertaking the HIA, the specialist performed a scoping assessment to verify and identify heritage sensitivities and preliminary impacts of the WEF on the site. The specialist verified that a full HIA needs to be undertaken as part of the process.
MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY 				
Avifaunal Impact Assessment	Relative Avian (Wind) Theme	**VERY HIGH**	**Y**	An Avifaunal Specialist was appointed to undertake the Avifaunal monitoring and Impact Assessment for the larger site area for the Ngxwabangu WEF site. Prior to undertaking the Avifaunal Impact Assessment, the specialist completed 24-months of avifaunal pre-

Screening Tool Recommended Specialist Assessment	Screening Tool Themes	Sensitivity Classification of Theme	Specialist Input Obtained Y/N	Motivation
				construction monitoring. The site is rated VERY HIGH due to the proximity to Cape Vulture Colonies and Cape Vulture restaurant sites.
MAP OF RELATIVE AVIAN (WIND) THEME SENSITIVITY 				
Bat Impact Assessment	Relative Bat (Wind) Theme	**HIGH**	Y	A Bat Specialist was appointed to undertake the Bat monitoring and Impact Assessment for the larger site area for the Ngxwabangu WEF. Prior to undertaking the Bat Impact Assessment, the specialist undertook pre-construction monitoring.
MAP OF RELATIVE BATS (WIND) THEME SENSITIVITY 				
No	Relative Civil Aviation (Wind) Theme	**LOW**	**N**	The CAA will be consulted during the PPP process for the proposed WEF. No additional action is recommended.

Screening Tool Recommended Specialist Assessment	Screening Tool Themes	Sensitivity Classification of Theme	Specialist Input Obtained Y/N	Motivation
MAP OF RELATIVE CIVIL AVIATION (WIND) THEME SENSITIVITY 				
No	Relative Defence Theme	**LOW**	**N**	No additional action is recommended.
MAP OF RELATIVE DEFENCE (WIND) THEME SENSITIVITY 				
Visual Impact Assessment	Relative Flicker Theme	**VERY HIGH**	**Y**	The relative flicker theme and preliminary potential flicker impacts from the WEF are included in the Visual Impact Assessment.

Screening Tool Recommended Specialist Assessment	Screening Tool Themes	Sensitivity Classification of Theme	Specialist Input Obtained Y/N	Motivation
MAP OF RELATIVE FLICKER THEME SENSITIVITY 				
Visual Impact Assessment	Relative Landscape (Wind) Theme	**VERY HIGH**	Y	A Visual Specialist was appointed to undertake a full Visual Impact Assessment (VIA) for the Ngxwabangu WEF.
MAP OF RELATIVE LANDSCAPE (WIND) THEME SENSITIVITY 				
Palaeontology Impact Assessment	Relative Palaeontology Theme	**VERY HIGH**	**Y**	A Palaeontological Specialist was appointed to undertake a Palaeontological Impact Assessment (PIA) for the WEF. Post site verification, the specialist determined that the site has a LOW palaeontology sensitivity.

Screening Tool Recommended Specialist Assessment	Screening Tool Themes	Sensitivity Classification of Theme	Specialist Input Obtained Y/N	Motivation
MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY 				
Noise Impact Assessment	Relative Noise Theme	**VERY HIGH**	Y	A Noise Specialist was appointed to undertake a full Noise Impact Assessment (NIA) for the proposed Ngxwabangu WEF.
MAP OF RELATIVE NOISE THEME SENSITIVITY 				
Plant Species Assessment	Relative Plant Species Theme	**MEDIUM**	**Y**	The assessment of the Plant Species forms part of the Terrestrial Biodiversity (Ecological) Impact Assessment, which was undertaken by a suitably qualified botanist.

Screening Tool Recommended Specialist Assessment	Screening Tool Themes	Sensitivity Classification of Theme	Specialist Input Obtained Y/N	Motivation
MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY 				
Terrestrial Biodiversity Impact Assessment Avifaunal Impact Assessment	Relative Terrestrial Biodiversity Theme	**VERY HIGH**	**Y**	Faunal and Botanical Specialists were appointed to undertake the faunal and botanical components of the Terrestrial Biodiversity (Ecological) Impact Assessment for proposed Ngxwabangu WEF. This is largely due the presence of CBA 1 areas, related to Cape Vultures, therefore the Avifaunal Impact Assessment is also relevant to this theme.
MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY 				
Socio-Economic Assessment		N/A	**Y**	A Socio-Economic Specialist was appointed to undertake a SEIA for the larger site area for the Ngxwabangu WEF. In addition, the PPP will be undertaken in accordance with the NEMA EIA Regulations, during which time potential concerns and/or benefits relating to the Socio-Economic impact of the proposed WEF can be raised by the registered Stakeholders and I&APs.

Please see Chapter 8, which outlines the specialists' findings of the site in terms of sensitivity, and Appendix D which includes the full Specialist Impact Assessments. In addition to this this, please see Chapter 10 which includes the full Sensitivity Analysis of the Ngxwabangu WEF site.

7 ALTERNATIVES

7.1 REASONABLE AND FEASIBLE ALTERNATIVES

Alternatives should include consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. In all cases, the no-go alternative must be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

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

7.2 FUNDAMENTAL, INCREMENTAL AND NO-GO ALTERNATIVES

7.2.1 FUNDAMENTAL ALTERNATIVES

Fundamental alternatives are developments that are totally different from the proposed project description and usually include the following:

- Alternative property or location where it is proposed to undertake the activity.
- Alternative type of activity to be undertaken.
- Alternative technology to be used in the activity.

7.2.2 INCREMENTAL ALTERNATIVES

Incremental alternatives relate to modifications or variations to the design of a project that provide different options to reduce or minimise environmental impacts. There are several incremental alternatives that can be considered with respect to the current wind farm project, including:

- Alternative design or layout of the activity.
- Alternative operational aspects of the activity.

7.2.3 NO-GO ALTERNATIVE

It is mandatory to consider the "no-go" option in the BA Process. The "no-go" alternative refers to the current status quo and the risks and impacts associated with it. Some existing activities may carry risks and may be undesirable (e.g. an existing contaminated site earmarked for a development). The no-go is the continuation of the existing land use, i.e. maintain the status quo.

7.2.4 TECHNOLOGY ALTERNATIVES

The choice of alternative technologies for the developer is constrained by the financial feasibility considerations. In South Africa, the licencing of all renewable energy developments is controlled by the IPPPP (independent Power Producers Procurement Programme (DMRE) who decide when and which types of renewable energy developments will be licenced through regulated competitive bidding processes. Since 2010 there have been seven competitive bidding processes for renewable energy developments, with 112 renewable energy producers being licenced to produce electricity. 43% of the renewable energy to be produced from these will be from wind energy projects. Solar energy accounts for 42% and the rest from hydro and various forms of bio sources. This competitive process ensures that only the most feasible and competitive developments are selected. This forces the developers to look for sites which will maximise the production of energy and be most cost effective. As a result of this, solar plants will only be competitive if they are located in the highest potential areas, and the same with wind, hydro and biomass energy developments. The relative potential for these four types of renewable energy production in South Africa has been assessed and mapped nationally. These potential energy production maps have been reproduced below (see Figure 7-1 to Figure 7-4) and indicate that the Cofimvaba area, where the developer is wanting to develop a project, is most suitable for wind energy production in terms of energy technology. While this area also has some potential for solar energy production, this would not be competitive with the solar plants located in the higher potential areas.

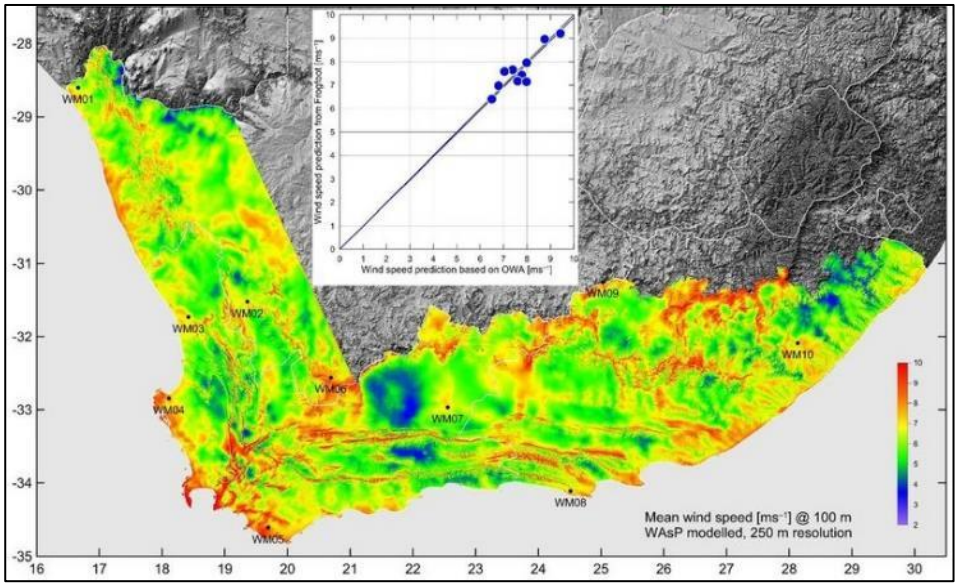


Figure 7-1: Mean Wind Speed (ms-1 at 100m) (WASA, 2014)

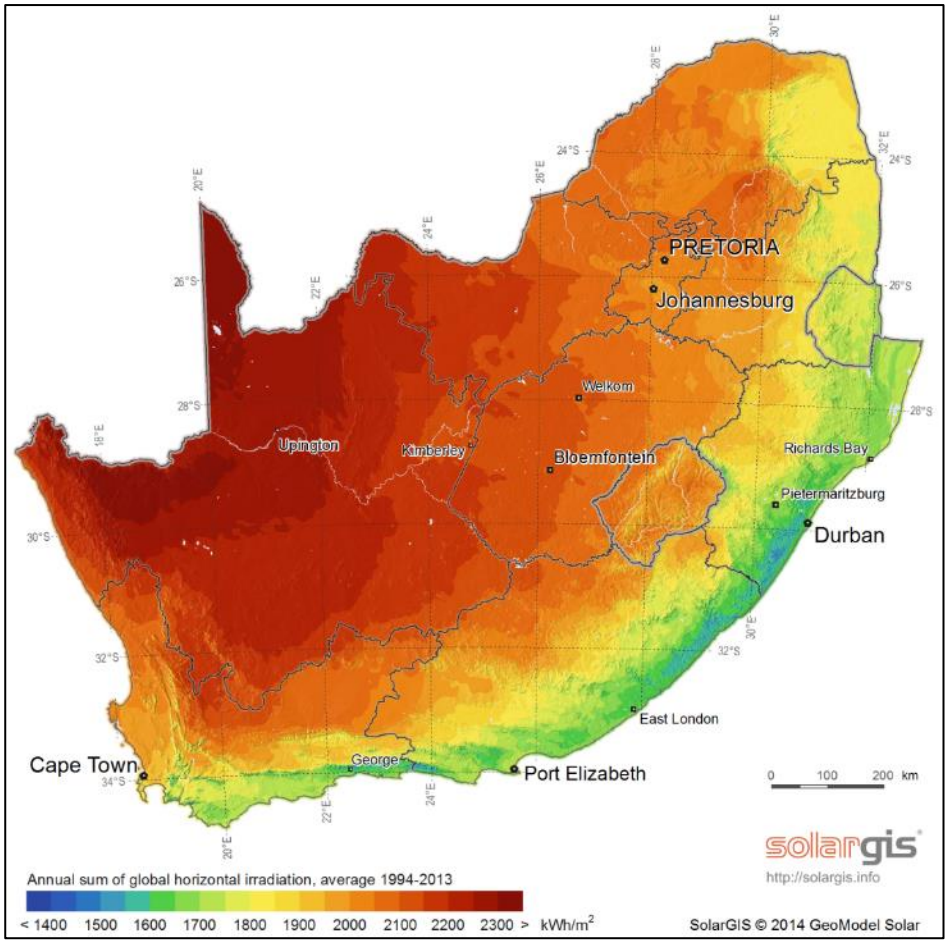


Figure 7-2: Solar Resource Availability (SolarGIS, 2013)

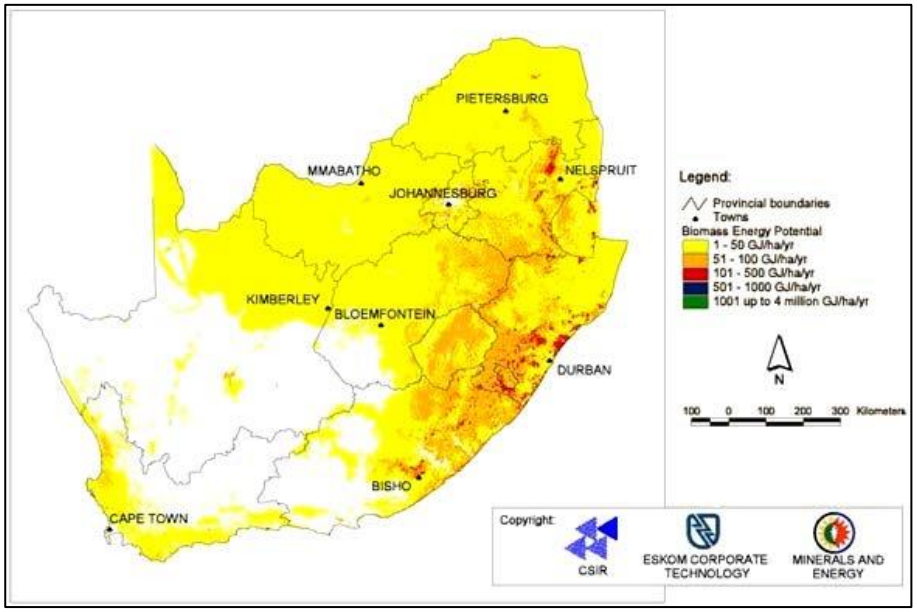


Figure 7-3: Biomass Potential (DME, Eskom, CSIR)

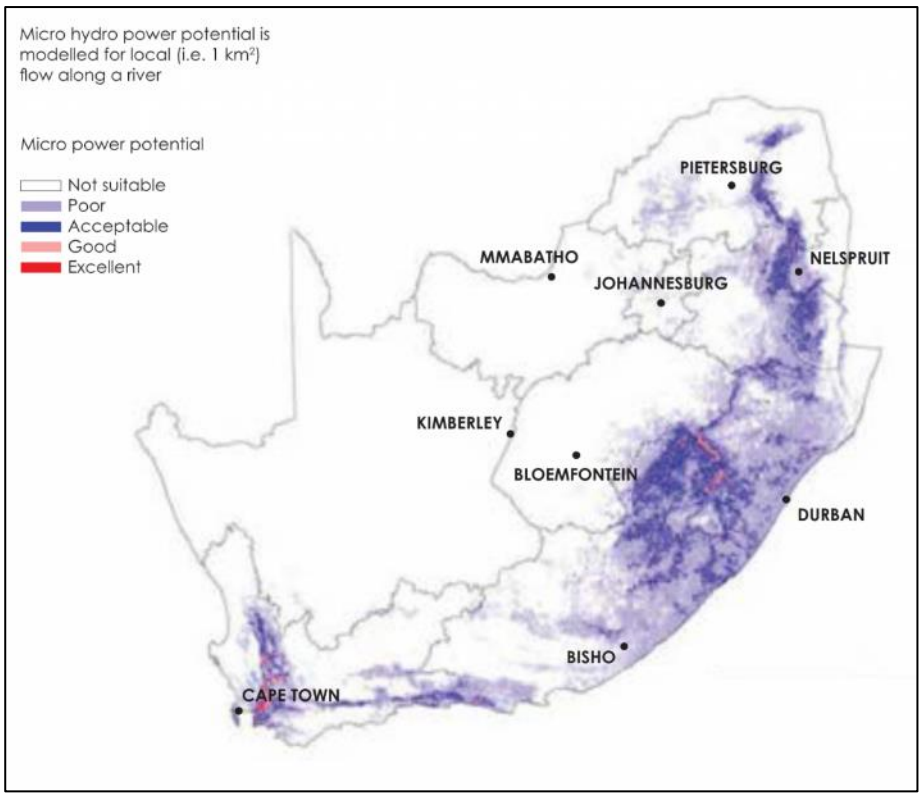


Figure 7-4: Micro Hydro Potential (DME, CSIR)

7.3 ALTERNATIVES CONSIDERED (TABULAR FORM)

Table 7-1 illustrates the methodology used to assess the identified alternatives. The table assesses the advantages and disadvantages, and provides further comments on the selected alternatives.

The categories of alternatives that are assessed include:

- Location;
- Activity;
- Associated technology;
- Design and layout; and
- No-go alternative.

Table 7-1: Analysis of the proposed Alternatives for the Ngxwabangu WEF site

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
Property or location This refers to the **fundamental location options**, and the environmental risks and impacts associated with such options.	**Alternative WEF location 1** - Current proposed site (Preferred alternative). This site has been selected based on good wind resource potential, land availability and the proximity of the site to available electrical grid. The site is also within the Stormberg REDZ (REDZ4)	⅄ Suitable wind resource. ⅄ Land availability (Ngxwabangu WEF and landowners have formally agreed to the proposed development on the site and are in full support of the use of this area). ⅄ Less sensitive than other alternative sites that the developer had considered in the broader eastern half of the Eastern Cape. Please see the extract in the "Comment" column which rationalises the choice of this site in terms of the region from an avifaunal perspective.	⅄ Potential visual intrusion to surrounding communities. ⅄ Potential impacts on avifauna, in particular Cape Vultures. ⅄ Potential impacts on bats. ⅄ Potential impact on local floral communities. ⅄ Potential impact on heritage features.	**YES**	The main determining factors for selecting the proposed location were:- ⅄ Proximity to a grid connection point. ⅄ Available land. ⅄ Available wind resource. ⅄ Preliminary environmental screening, including an avifaunal nest survey, has been performed to identify potential issues. Preliminary investigations have identified that the proposed project site meets the above land specifications. It is of vital importance to consider the following extract from the Avifaunal Impact Assessment report. *"On a broader level, WildSkies has previously recommended against the development by EDFR of wind farms at the following sites: Woodstock; Lusikisiki; Dutywa; Hlobo; Qunu; and Qumbu. With the exception of Woodstock, these projects were all in the former Transkei. These recommendations were all primarily on the basis of risk to Cape Vultures. In all cases EDFR have respected the recommendations and dropped the proposed projects. EDFR has also gone to considerable lengths beyond compliance with best practice guidance to study the risk to Cape Vulture. This included a special vulture feeding trial at the Hlobo site using a purpose bought and*

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
					euthanised cow. EDFR have advised that the current proposed Ngxwabangu wind farm will be the only project they pursue in the former Transkei. In our view, this is a good example of the consideration of alternatives, and avoidance of impacts at a wider scale by the same company"
	Alternative WEF location 2 - None identified as the rights to **sufficiently large enough contiguous parcels of** private land must be sought from local landowners. In addition to this land in the area is being signed up by competing developers at a rapid rate. Location 1 has been agreed to. Alternative sites in the area that are close to Eskom electrical infrastructure, do not yield the same wind resource potential.	***N/A***	***N/A***	***N/A***	Alternative locations for the current project are limited and were not deemed to be either reasonable or feasible due to the following: • The proposed site is situated within the Stormberg REDZ. • The available wind resource is the most critical aspect of a wind energy project since a feasible WEF must generate sufficient energy to be financially feasible in terms of REIPPPP. • A feasible WEF must also be located close to a connection point into the Eskom grid and substation. This is a critical factor to the overall technical and financial feasibility of the WEF project.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
					• Alternative locations have been considered (see quotation above from the Avifaunal Impact Assessment). Although not assessed in this report, these sites were excluded during/after completion of Avifaunal Pre-construction Monitoring and eliminated due to avifaunal sensitivity. In terms of this assessment process, no additional alternative locations have been assessed for the proposed Ngxwabangu WEF.
	Alternative BESS, IPP SS and Switching SS location 1 – Southern BESS Site. This site has been selected based site sensitivities, its proximity to the majority of the turbine locations and the topography of the area.	• Proximity to wind turbines. • Location in relation to site sensitivities. • Access to the site (shorter access from offsite) for construction and maintenance purposes. • The southern BESS/IPP SS/ Switching SS site would result in a shorter OHL required for the Eskom Grid Connection.	• No apparent disadvantages.	**YES**	The main determining factors for selecting the proposed locations were:- • Proximity to turbines. • Proximity to the grid connection point. • Available land. • Available wind resource. • Environmental screening. The preferred alternative in terms of the BESS, IPP SS and Switching SS is Alternative 1 which is situated south of Alternative 2. This would reduce the length of the OHL required to connect to

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
	Alternative BESS, IPP SS and Switching SS location 2 – Northern BESS Site. This site has been selected based site sensitivities, its proximity to the majority of the turbine locations and the topography of the area.	▲ Proximity to wind turbines. ▲ Location in relation to site sensitivities. ▲ Access to the site for construction and maintenance purposes.	▲ The northern BESS/IPP SS/ Switching SS site would result in a longer OHL required for the Eskom Grid Connection. This will increase the risk to avifauna and would result in a larger OHL footprint.	**YES**	the Eskom grid, thereby reducing the potential impact on avifauna and reducing the overall OHL footprint.
Type of technology This refers to the fundamental technology options, such as energy generation from wind vs. coal fired power plant, etc. and the environmental risks and impacts associated with such options.	**Alternative energy technology 1** – Wind turbines (Preferred alternative)	▲ Clean and renewable energy. ▲ Mitigate climate change ▲ Does not require large areas of land.	▲ Visually intrusive ▲ Avifaunal impacts ▲ Bat impacts ▲ Heritage impacts	**YES**	The activity does not exclude all current land uses i.e. stock grazing can still take place between turbines.
	Alternative energy technology 2 – Solar PV	▲ Clean and renewable energy. ▲ Mitigate climate change.	▲ Visually intrusive (but less so than a WEF) ▲ Heritage impacts (potentially more so than a WEF due to the area required). ▲ Requires a large area of land. ▲ Requires more water than for a WEF ▲ Generates less power per hectare than wind does, and is less suitable in terms of the solar PV resource map described in Section 7.2.	**NO**	Wind and solar are not mutually exclusive, i.e. both developments can take place in close proximity to one another. The topography of the land earmarked for the proposed Ngxwabangu WEF, as well as the presence of rivers and wetland features in the low-lying flatter areas, present challenges for the development of large-scale solar PV. The applicant intends on bidding the project as part of the wind allocation under the REIPPPP.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
	Alternative energy technology 3 – Concentrated Solar Power (CSP)	• Clean and renewable energy. • Mitigate climate change.	• Visually intrusive. • Requires large area of land. • Water a significant limiting factor. • Reflectivity of mirrors potentially a significant issue visually and in terms of avifauna, and is less suitable in terms of the solar PV resource map described in Section 7.2.	**NO**	Wind and solar are not mutually exclusive, i.e. both developments can take place in close proximity to one another. The topography of the land earmarked for the proposed WEF is not suitable for large scale solar CSP. In addition to this, the solar potential of the site is limited in comparison to the wind potential. This technology would not qualify for REIPPPP.
	Alternative energy technology 4 – Coal fired power plant	• None identified	• Air pollution from coal dust and smokestack emissions (SO_2). • Contribution to climate change. • Ground contamination from coal dust.	**NO**	Not environmentally desirable and would not qualify for REIPPPP.
	Alternative energy technology 5 – Biomass	• Clean and renewable energy. • Mitigate climate change.	• Expensive source of energy, requiring large amounts of feedstock.	**NO**	Sufficient suitable biomass may not be available in proximity to the site. Biomass energy is mutually exclusive.
	Alternative energy technology 6 – Nuclear Power	• Greater electricity generation with little raw material required.	• Raw material highly radioactive. • Water availability a severe limitation. In South Africa, which is a water scarce country, the most suitable sites for	**NO**	The significant dependence of nuclear energy generation on high volumes of water precludes its development on the proposed site. Nuclear energy is mutually exclusive to wind energy.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
			Nuclear Power are situated adjacent to the ocean.		
	Alternative BESS battery storage technology 1: Solid-state (such as Li-ion (lithium ion)) Battery Technology	▲ High level of energy efficiency. ▲ Relatively high energy density. ▲ Fast response to unpredictable variations in demand and generation. ▲ Low maintenance. ▲ Relatively long lifecycle (approximately 10 to 15 years' service life). ▲ Ability to offset grid fluctuations. ▲ Currently the most widely used BESS technology.	▲ Fire risk due to thermal runaway. ▲ High cost due to limited abundance in lithium. ▲ Risk of annual degradation. ▲ Battery protection is required. ▲ Power and energy capacity directly coupled (expensive to scale).	**YES**	The technology alternatives which have been considered for the battery storage include solid-state technologies (such as Li-ion), Vanadium Redox Flow and Zinc-Hybrid technologies. Solid-state technology is the preferred alternative and the only technology assessed further in the BA Process. Li-ion is currently the most widely used and assessed battery storage technology available.
	Alternative BESS battery storage technology 2: Vanadium Redox Flow Battery Technology	▲ Fast response to unpredictable variations in demand and generation. ▲ Long life cycle (approximately 20 years' service life). ▲ Almost unlimited energy capacity. ▲ No capacity degradation over time. ▲ Electrolyte is inherently safe and non-flammable.	▲ Scarce and expensive components (vanadium pentoxide). ▲ Lower level of energy efficiency. ▲ Lower energy density than solid state batteries (such as li-ion). ▲ Require the storage of electrolyte chemicals in tanks for which a Major Hazards Risk	**YES**	

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
		▲ Independently tuneable power rating and energy capacity.	Assessment may be required due to storage of hazardous goods. ▲ Requires a larger development footprint (unless the containers are stacked). ▲ Currently not market competitive.		
	Alternative BESS battery storage technology 3: Zinc-hybrid Ion Battery Technology	▲ Relatively low cost. ▲ Among the latest advanced chemistries.	▲ Currently an emerging technology with limited deployment and a lack of available technical information. ▲ Currently not market competitive.	**NO**	
Design or layout This relates mostly to alternative ways in which the proposed development or activity can be physically laid out on the ground to minimise or reduce environmental risks or impacts	**Alternative layout 1:** Preliminary WEF layout, access route, electrical switching stations and short connecting powerline	▲ The proposed layout consisted of up to 50 turbines.	▲ Specialist highlighted specific turbines which required relocation. ▲ Specialists identified the need for a Biodiversity Offset Strategy. ▲ The project could not be holistically considered without the addition of the grid connection infrastructure.	**YES**	This proposed 50 turbines layout was assessed in an initial application submitted to the DFFE (DFFE Ref: 14/12/16/3/3/1/2674). After much engagement with various stakeholder and the specialists, the recommendation as to refine the layout (reduced and turbines repositioned) and draft a Biodiversity Offset Strategy. This application was withdrawn and Alternative 2 has been proposed. The new application (this application) will undergo formal public participation after which all correspondence will be tabulated and responded to in detail in Appendix I of this report.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
	Alternative layout 2 (preferred): Preliminary WEF layout, access route, electrical switching stations and short connecting powerline	▲ The proposed layout consists of up to 36 turbines.	▲ There will be impacts associated with turbine placement and upgrading and expanding road reserves in sensitive environments.	**YES**	The 36-turbine layout has been assessed by specialists and was designed in response to specialist recommendation on the Alternative 1 layout provided. The preferred layout has been informed by the feasibility, initial BA Process and associated specialist assessments. However, the final proposed WEF layout will be presented in the Final BAR once the PPP has been concluded and thorough stakeholder engagement has been factored into the layout. At present, the layout has been optimised from a sensitivity perspective and all NO-GO areas have been avoided.
Operational aspects This relates mostly to alternative ways in which the development or activity can operate in order to reduce environmental risks or impacts	**Alternative operational activities**	▲ Operational Management alternatives will be informed by specialist input (e.g. bird and bat monitoring) through on-going operational monitoring.	N/A	**YES**	Operational alternatives have been and will be informed by the specialists. The most pertinent specialists who have informed operational alternatives are the bat and avifaunal specialists. Should these specialists find that certain turbines require curtailment due to their location then this will be included as part of the operational management of the WEF. Should management stipulations be required for the proposed WEF then they will form part of the EMPr of the proposed WEF.
No-go option This refers to the current status quo and the risks and impacts associated to it.	Small stock grazing and small-scale game farming.	▲ Will remain relatively undisturbed.	▲ No contribution towards the national renewable energy target. ▲ Potential for the alien vegetation on site to continue detrimentally	**YES**	Assessed in this report.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
			affecting the local flora. • None of the proposed socio-economic benefits will be realised.		
Cumulative Impact This refers to the surrounding activities of the site and the additional impacts that the proposed WEF would have on these activities. There are currently no operational WEFs in the area.	Small stock grazing, small scale agricultural crops, large mass of alien vegetation plantations.	• The activities are currently managed on a small scale. • Activities such as alien vegetation clearing are not available to communities due to funding. This project has the potential to assist in mitigating this impact. • Existing OHLs in the area are currently having an impact on the local avifaunal populations. This project has the potential to assist in mitigating this impact.	• No contribution towards the national renewable energy target. • Potential for the alien vegetation on site to continue, detrimentally affecting the local flora. • Potential for the impact on avifauna due electrocution on existing OHLs to be worsened should the project not carefully consider avifaunal mitigation strategies	**YES**	Assessed in this report.

7.4 ALTERNATIVES ANALYSIS AND DISCUSSION

7.4.1 LOCATION ALTERNATIVES (WEF)

The proposed Ngxwabangu WEF has many aspects which are considered imperative to the alternatives discussion. In order to adequately appreciate the current proposed site, one needs to understand the history of the site in terms of wind development.

The proposed Ngxwabangu WEF is situated within the Stormberg REDZ. Prior to the proclamation of REDZ areas within South Africa, InnoWind (which later became known as EDFR, the holding company of the proposed Ngxwabangu WEF) proposed the Ncora WEF within the south-eastern portion of this site. CES undertook the Scoping and EIA Process for the Ncora WEF, along with many of the same specialists who have been part of this new application, including WildSkies (avifaunal specialist). The Ncora WEF received Environmental Authorisation in 2013. Meanwhile, in the broader region, InnoWind/EDFR was exploring a number of sites from an environmental perspective, with an emphasis on avifauna, in particular the Cape Vulture (*Gyps coprotheres*).

From an Avifaunal perspective, WildSkies (avifaunal specialist for the Ngxwabangu WEF) has previously recommended against development by InnoWind/EDFR of WEFs at the following sites: Woodstock; Lusikisiki; Dutywa; Hlobo; Qunu; and Qumbu. With the exception of Woodstock, these projects were all proposed in the former Transkei region. These recommendations were all primarily based on risk to Cape Vultures. In all cases EDFR respected the recommendations in terms of fatally flawing the proposed projects. EDFR has also gone to considerable lengths, beyond compliance with best practice guidance, to study the risk to Cape Vulture. This included a special vulture feeding trial at the Hlobo site using purposely bought and euthanised cows. EDFR have advised both CES and WildSkies that the current proposed Ngxwabangu WEF will be the only project they pursue in the former Transkei. The decision is based on the environmental suitability of the site, the social context of the area and the economic benefits that would be far reaching within the region. These three spheres of sustainable development, combined with the fact the site is situated within a REDZ and has excellent wind speeds, make the site preferred in a regional context. In our view this is a good example of the consideration of alternatives, and avoidance of impacts at a wider scale by the same developer.

Figure 7-6 below illustrates the Ngxwabangu WEF site in the context of the broader former Transkei/ eastern Eastern Cape region. This map is a critical piece of the alternatives puzzle as it contextualises the site visually. The positive attributes of the site, in relation to the former Transkei, and compared to previously considered sites include the following:

- The proposed Ngxwabangu WEF is situated within the Stormberg REDZ which is desirable from a regionally planning perspective;
- The proposed Ngxwabangu WEF is situated, partially, on the Ncora WEF site which received Environmental Authorised approximately 10 years ago. This project has since been allowed to expire in order to reconsider the area from a technical perspective;
- The proposed Ngxwabangu WEF is situated within a excellent wind speed area within close proximity to the existing Eskom Qolweni Substation;
- The proposed Ngxwabangu WEF is situated within a region of South Africa that has a history of being overlooked in terms of economic development and upliftment. The proposed project can and will contribute socially and economically to an area is desperate need of economic upliftment (please refer to the SEIA in Appendix D of this BAR);
- The proposed Ngxwabangu WEF is situated a considerable distance from the closest Cape Vulture (*Gyps coprotheres*) 50km and Bearded Vulture (*Gypaetus barbatus*) 10km buffer areas.

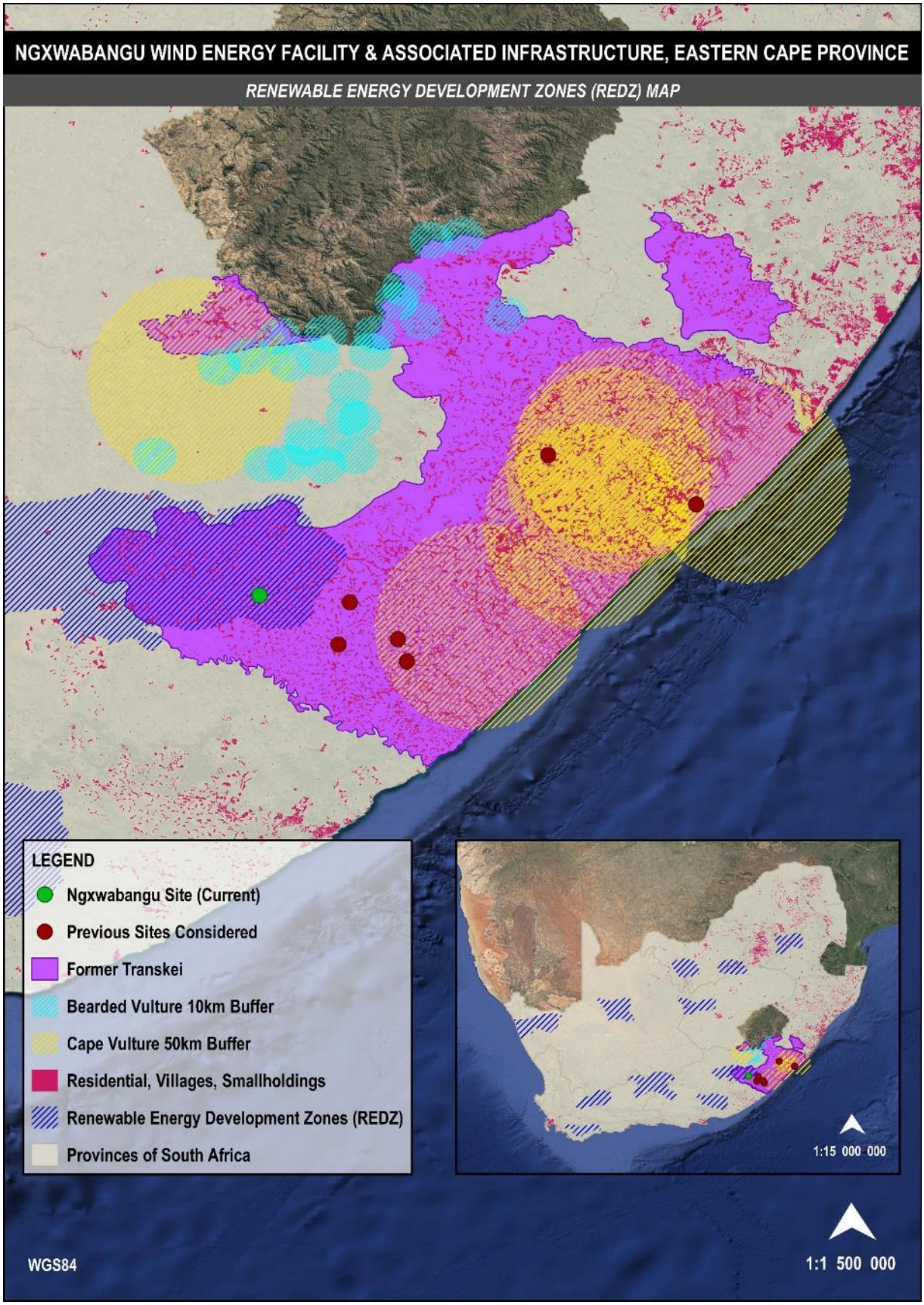


Figure 7-6: Ngxwabangu WEF in relation to previously assessed EDFR sites, indicating the site in relation to both the REDZ and the Cape Vulture colonies (inclusive of 50km buffers).

7.4.2 LAYOUT ALTERNATIVES (WEF)

In addition to the location alternatives discussed in 7.4.1, it is also important to understand the history of the proposed Ngxwabangu WEF in the context of the current application. The proposed Ngxwabangu WEF was applied for, without the OHL infrastructure and without a Biodiversity Offset Plan, in November 2022. The initial project description was for a total of 50 turbines which were assessed by specialists. The outcomes of the Draft BAR and specialist process was that a number of turbines would need to be removed/relocated due to sensitivities and the recommendation by the Ecological Specialist and the EAP was that a Biodiversity Offset Strategy would be required.

A new approach was then followed, and this new application now includes a reduced number of turbines, a Biodiversity Offset Strategy and a holistic application which includes all infrastructure in one application. This has been done to ensure that the Offset Strategy and specialist assessments consider the facility as a whole, in one application. We strongly believe that this makes for a more transparent process which allows Stakeholders and I&APs to consider the Ngxwabangu WEF as a full project, Eskom infrastructure included.

An example of how this new application addresses previous Specialist, Stakeholder and I&AP comments is illustrated below:

- The addition of Chapter 7.4 (Alternatives Analysis and Discussion) to the Draft BAR;
- The addition of Chapter 10 (Biodiversity Offset Strategy) to the Draft BAR; and
- The addition of a layout alternative (36 turbines instead of 50 turbines) to the Alternatives Chapter (Chapter 7) and to the Sensitivity Analysis (Chapter 11). Please see Table 11-1, as extracted from the sensitivity analysis chapter, below:

TURBINE NUMBER	50 TURBINE LAYOUT	36 TURBINE LAYOUT (PREFERRED)	COMMENT
WTG 01	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 02	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 03	MODERATE TO HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 04	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 05	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 06	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 07	HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 08	HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 09	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 10	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 11	VERY HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 12	VERY HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 13	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 14	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 15	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 16	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 17	VERY HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 18	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 19	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 20	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 21	HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 22	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 23	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 24	VERY HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 25	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 26	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 27	VERY HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION

WTG 28	VERY HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 29	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 30	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 31	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 32	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 33	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 34	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 35	VERY HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 36	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 37	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 38	VERY HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 39	VERY HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 40	MODERATE TO HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 41	MODERATE TO HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 42	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 43	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 44	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 45	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 46	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 47	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 48	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 49	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 50	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
SUMMARY	50 TURBINE LAYOUT		
NO-GO/VERY HIGH	9 TURBINES	0 TURBINES	
HIGH SENSITIVITY	3 TURBINES	0 TURBINES	
HIGH/MODERATE SENSITIVITY	11 TURBINES	0 TURBINES	
MODERATE SENSITIVITY	27 TURBINES	36 TURBINES	
LOW/MODERATE SENSITIVITY	0 TURBINES	0 TURBINES	
LOW/NO IDENTIFIED SENSITIVITY	0 TURBINES	0 TURBINES	

WEF Layout:

- WEF Layout Alternative 2 is the preferred alternative, it is a reduced and refined layout (50 turbines reduced to 36) based on specialist input and recommendations.
- The proposed turbines will have a hub height of up to 130m, a rotor diameter of up to 170m, blade length of up to 85m, and a maximum tip height of up to 215m and a lower tip height of 30m. These dimensions are also reduced from the size of the turbines proposed as part of Layout Alternative 1 (50 turbine).
- Permanent laydown areas adjacent to each wind turbine (up to 4 000 m^2).
- Temporary laydown areas adjacent to each wind turbine (up to 3 150 m^2).
- Foundations (up to 900 m^2) for each wind turbine.

7.4.3 Layout Alternatives (Associated Infrastructure)

The ancillary infrastructure associated with the proposed WEF, inclusive of various Substations and OHLs has been considered by all specialists and by the EAP. The motivation behind each alternative is indicated below.

IPP Substation Alternatives:

- IPP Substation Alternative 2 is the preferred alternative, it is situated in the northern area. Is required in terms of the preferred connection point.
- None of the Specialists have flagged any issues related to this alternative, in particular.

BESS Alternatives:
- BESS Alternative 2 is the preferred alternative, it is situated in the northern area. It is required in terms of the preferred connection point.
- None of the Specialists have flagged any issues related to this alternative, in particular.

33kV underground powerline (Collector Substation to IPP Substation):
- Both 33kV powerline alternative of up to 6km and 9km in length are required as part of the preferred layout, they are situated within the western cluster of turbines and connect the northern and eastern collector Substations.
- None of the Specialists have flagged any issues related to these alternatives, in particular.

33kV overhead powerline (Northern Section to Southern Section)
- There is only one alternative for this OHL. It has been designed based on specialist sensitivities, with their input.
- None of the Specialists have flagged any issues related to this alternative, in particular.

132kV overhead powerline (33/132kV IPP Substation to the Eskom Qolweni Substation)
- Alternative 2a is proposed from the northern IPP Substation (Alternative 2). This OHL is 132kV and is up to 20km in length. This is the preferred alternative (2a).
- None of the Specialists have flagged any issues related to this alternative, in particular.

Collector Substations
- Four (4) Collector Substations of up 3ha each (33kV). Two (2) of the Collector Substations are situated within the western cluster of turbines and two (2) of the Collector Substations are situated within the eastern cluster of turbines.
- All four Collector Substations are required as part of the preferred layout.
- None of the Specialists have flagged any issues related to these Collector Substations.

Temporary Laydown Area, Temporary Buffer Yard, Temporary Batching Plant, Temporary CTMF and Temporary Site Camp/Construction Compound
- There is only one alternative proposed for the temporary infrastructure. Its position is based on proximity to the access road and ease of distribution to all areas of the site from a fairly central region of the site.
- None of the Specialists have flagged any issues related to this temporary infrastructure.

33kV underground cabling connection turbines to the 4 Collector Substations
- There is one underground cabling layout proposed and this relates to the preferred turbine layout.
- None of the Specialists have flagged any issues related to this alternative, in particular.
- This same layout is linked to the road layout, as discussed in the next point, and has been optimised based on technical location of turbines and environmental sensitivities.

Internal Access Roads 15m wide (construction phase) / 8m wide (operational phase)
- There is one road layout proposed and this relates to the preferred turbine layout.
- None of the Specialists have flagged any issues related to this alternative, in particular.
- This same layout is linked to the underground cabling layout, as discussed in the previous point, and has been optimised based on technical location of turbines and environmental sensitivities.

The preferred alternatives have been extracted to a single, layout map as Figure 7-7 below. Based on the specialist input, the preferred alternatives are acceptable.

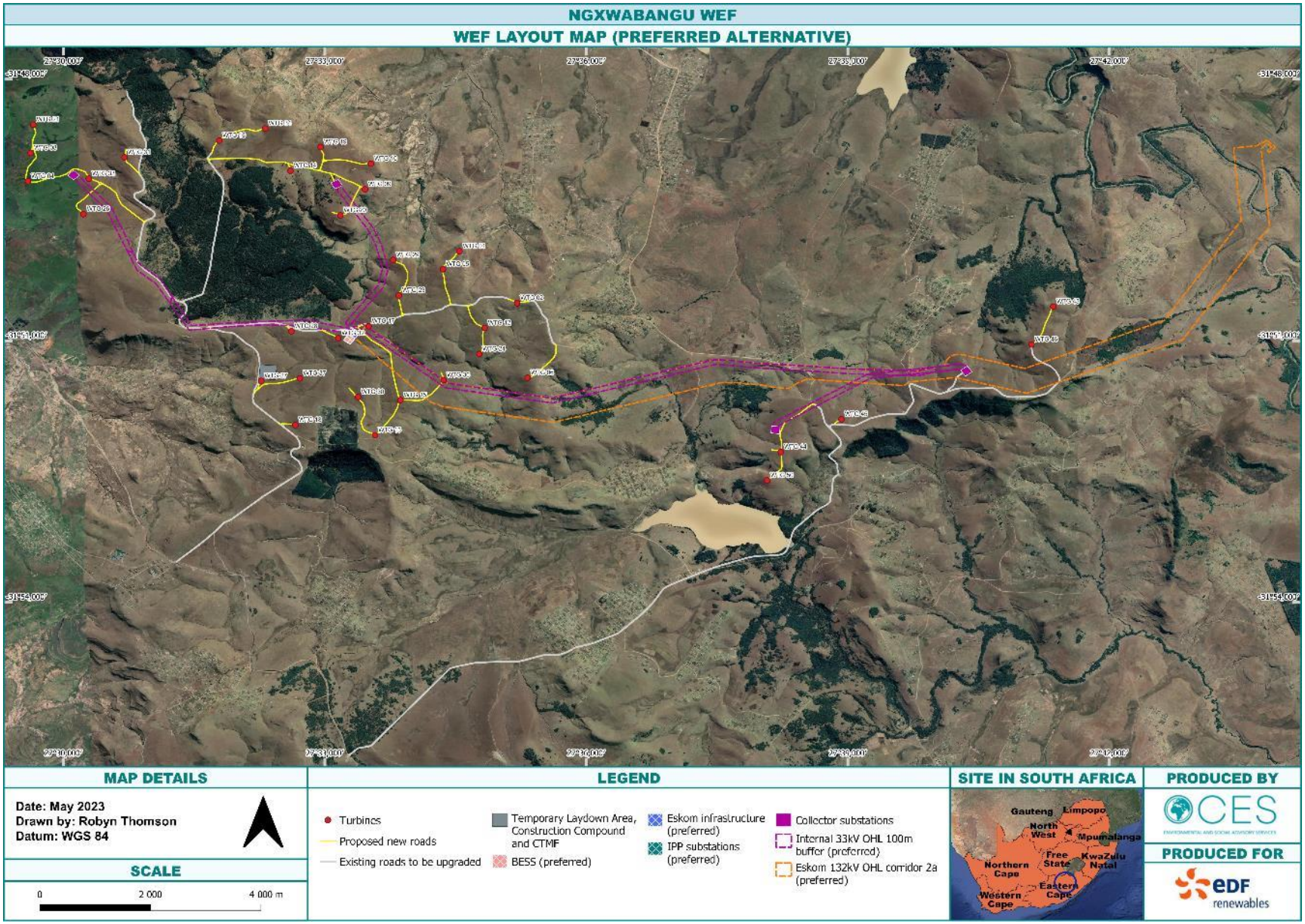


Figure 7-7: Ngxwabangu WEF Preferred Alternatives Map (as per 7.4 analysis)

8 KEY FINDINGS OF THE SPECIALIST STUDIES

Appropriately qualified and experienced specialists were appointed to undertake the various assessments identified as being necessary. Specialists gathered baseline information relevant to the study and assessed impacts associated with the Ngxwabangu WEF. Specialists have also made recommendations to mitigate negative impacts and enhance benefits. The resulting information has been synthesised in the section below, whilst the full specialist reports have been attached to the BAR as a Specialist Report section in Appendix D.

The following Specialist Studies have been completed as part of the BA Process–

- Aquatic Impact Assessment;
- Avifaunal Impact Assessment;
- Bat Impact Assessment;
- Ecological (Flora and Fauna) Impact Assessment;
- Heritage (Archaeological) Impact Assessment
- Noise Impact Assessment;
- Paleontological Impact Assessment;
- Socio-Economic Impact Assessment; and
- Visual Impact Assessment.

8.1 AQUATIC IMPACT ASSESSMENT

STUDY	**Aquatic Impact Assessment**
SPECIALIST	**Brian Colloty**
COMPANY	**EnviroSci**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F**

8.1.1 CONCLUSION & SPECIALIST STATEMENT

The specialist has no objection to the authorisation of the proposed activities assuming that all mitigations and buffer zones are implemented.

None of the grid connections are favoured as these all impact on wetland areas along some point of the alignment, but it has been confirmed that the final placement of towers / poles will take cognisance of the wetland layers shown, and that only cables will span these areas.

The significant impacts are associated with the access road crossings on the seepage wetlands. These systems are generally in a less modified state and still provide some habitat and important ecological functions.

Mitigation should focus on these areas and include measures to halt erosion and rehabilitate habitat in the sections affected by the construction. Without the implementation of mitigation measures, the project has potential to cause a Medium cumulative impact upon aquatic biodiversity. However, with the adoption of mitigation, the proposed project will have a Low impact upon aquatic biodiversity.

8.1.2 IMPACTS

The following impacts were raised in the Aquatic Impact Assessment Report. Please see Chapter 9 of this report (BAR) and Chapter 6 of the Aquatic Impact Assessment Report for more detail:

- Disturbance or loss of aquatic habitat during construction and decommissioning phases.

- Impact on riparian and wetland systems through the possible increase in surface water runoff on form and function during the construction and into the operational phase, i.e. changes to the hydrological regime.
- Changes to hydrological regimes that could also lead to sedimentation and erosion, that could also occur in the operational phase.
- Potential impact on localised surface water quality.
- Cumulative impacts on the aquatic resources of the area.

8.1.3 MITIGATION MEASURES

Mitigation measures to reduce residual risk or enhance opportunities:

- The final design must avoid the indicated No-Go areas, especially the grid towers / poles regardless of the option used, i.e. all options intersect with wetlands at some point.
- A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to micro-siting of the final layout.
- Where large cut and fill areas are required these must be stabilised and rehabilitated during the construction process, to minimise erosion and sedimentation.
- Suitable stormwater management systems must be installed along roads and other areas and monitored during the first few months of use. Any erosion / sedimentation must be resolved through whatever additional interventions maybe necessary (i.e., extension, energy dissipaters, spreaders, etc).
- To minimise the impact of the access roads:
    - Use existing roads or upgrade existing tracks to cross wetlands rather than constructing entirely new roads wherever possible.
    - Use the smallest possible working corridor. Outside the working corridor, all watercourses are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. Where intrusion is required, the working corridor must be kept to a minimum and demarcated clearly, before any construction commences.
    - Removal of vegetation must only be when essential for the continuation of the project. Do not allow any disturbance to the adjoining natural vegetation cover or soils.
    - All pipe culverts must be removed and replaced with suitable sized box culverts, where road levels are raised. Crossings that are installed below the natural ground level are to be constructed with an appropriate drop inlet structure on the upstream side to ensure that headcut erosion does not develop as a result of the gradient change from the natural ground level to the invert level of the culvert.
    - The channel profile, regardless of the current state of the river / water course, will be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a pre-construction walkdown.
    - Water diversions must be temporary in nature and no permanent walls, berms or dams may be installed within a watercourse. Sandbags used in any diversion or for any other activity within a watercourse must be in a good condition, so that they do not burst and empty sediment into the watercourse. Upon completion of the construction at the site, the diversions shall be removed to restore natural flow patterns. Under no circumstance shall a new channel or drainage canals be excavated to divert water away from construction activities.
- Any fauna (frogs, snakes, etc.) that are found within the construction area must be moved to the closest point of similar habitat type outside of the areas to be impacted.

- All disturbed areas beyond the construction site that are intentionally or accidentally disturbed during the construction phase must be rehabilitated.
- It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas.
- The buffer area must be considered as a No-Go area for development and large infrastructure.
- The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area.
- The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion.
- Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil. Contingency plans must be in place for high rainfall events which may occur during construction.
- Monitoring of the project activities is essential to ensure the mitigation measures are implemented. Compliance with the mitigation recommendations must be audited by a suitably qualified independent Environmental Control Officer with an appropriately timed audit report.
- A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems. The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area. The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion. Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil.
- Sedimentation must be minimised with appropriate measures. Any construction, within or directly upslope of a watercourse, causing bare slopes and surfaces to be exposed to the elements must include measures to protect against erosion using rows of silt fences, sandbags, hay bales and/or earthen berms spaced along contours at regular intervals. Construction must have contingency plans for high rainfall events during construction.
- Energy dissipaters should be installed to prevent scour at any culvert outlet. This can be constructed of appropriately sized rock armour. Coarse bedding material or geotextile wrapped dump rock must be considered for use wherever the roads crosses wetland characterized by diffuse subsurface flows such as the seeps.
- Stormwater infrastructure must be inspected at least once every year (before the onset of rains) to ensure that it is working efficiently. Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters.
- All liquid chemicals including fuels and oil, including for the BESS, must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. Such facilities must be inspected routinely and must have the suitable PPE and spill kits needed to contain likely worst-case scenario leak or spill in that facility, safely.
- Washing and cleaning of equipment must be done in designated wash bays, where rinse water is contained in evaporation/sedimentation ponds (to capture oils, grease cement and sediment).
- Mechanical plant and bowsers must not be refuelled or serviced within 100m of a river channel.
- All construction camps, lay down areas, wash bays, batching plants or areas and any stores should be more than 50 m from any demarcated water courses.
- Littering and contamination associated with construction activity must be avoided through effective construction camp management.

- No stockpiling should take place within or near a water course.
- All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable.
- ESO monitors the site on a daily basis to ensure plant is in working order (minimise leaks), spills are prevented and if they do occur, are quickly rectified.

8.2 AVIFAUNAL IMPACT ASSESSMENT

STUDY	**Avifaunal Impact Assessment, based on 24-month Pre-Construction Monitoring Campaign**
SPECIALIST	**Jon Smallie**
COMPANY	**WildSkies Ecological Services**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F**

8.2.1 CONCLUSION & SPECIALIST STATEMENT

The site is located on a grassy plateau at an average altitude of approximately 1500m metres above sea level. The central portion of the site consists of pine and wattle plantations, whilst the majority of the site is grassland. A relatively high diversity of bird species occur here, and several of them are regionally Red Listed. At the outset, the Cape Vulture *Gyps coprotheres* was recognised to be the most important species at this site, and the monitoring programme was designed accordingly.

- We classified seven bird species as being at Medium or High risk should the project proceed. These are: Cape Vulture (Endangered); Grey Crowned Crane (Endangered); Rudd's Lark (Endangered); Lanner Falcon (Vulnerable); Denham's Bustard (Vulnerable); Yellow-breasted Pipit (Vulnerable); and Jackal Buzzard (endemic, not Red Listed).
- We crudely predict that a total of 20.22 target bird species could be killed annually by the current proposed layout of 54 turbines. This includes most importantly: 10.15 Cape Vulture; 4.73 Jackal Buzzard; 0.43 Lanner Falcon; 0.30 Grey-Crowned Crane; and 0.16 Denham's Bustard.

Based on the information currently available, we judge the risk of collision of Cape Vultures with turbines to be Very High significance pre-mitigation. Mitigation measures currently available remain largely untested in South Africa (although observer led shutdown on demand has shown promise at a South African wind farm in the last year) or at best partially effective and cannot be expected to reduce the significance lower than High significance.

8.2.2 IMPACTS

The following impacts were raised in the Avifaunal Report. For additional information please refer to Chapter 9 of this report and Chapter 10 of the Avifaunal Report.

- Destruction of bird habitat during construction of the facility.
- Disturbance of birds.
- Displacement of birds from the site and barrier effects.
- Collision of birds with turbine blades.
- Powerline collision and electrocution.
- Cumulative Impacts of wind energy facilities on birds in this area.

8.2.3 MITIGATION MEASURES

In addition to the avoidance measures already implemented, the following mitigation is recommended:

- The No-Go areas identified by this study (which build on those identified in the pre-construction bird monitoring) should be adhered to.

- If more than five years elapses between this study and construction, there may be a need to conduct further monitoring on site to determine whether any significant avifaunal features have changed in the interim.
- A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the Basic Assessment (BA) Process and the construction phase. This should be done as part of the EMPr and final layout approval, preferably between October and March.
- All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.
- A post construction inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species. It is essential that the new wind farm does not create favourable conditions for such mammals in high risk areas. We therefore recommend that within the first year of operations a full assessment of this aspect be made by the ornithologist contracted for post construction monitoring. If such conditions have been created, case specific solutions will need to be developed and implemented by the wind farm.
- A Biodiversity Management Plan (BMP) must be designed by an ornithologist for the site prior to the Commercial Operation Date (COD). This BMP should include a bird fatality threshold and adaptive management policy, which identifies the number of bird fatalities of priority species which will trigger a management response, appropriate responses, and timelines for such responses. Fatalities of priority bird species are usually rare events (but with very high consequence) and it is difficult to analyse trends or statistics related to these fatalities as they occur. It is therefore important to have a threshold policy in place proactively to assist adaptive management. The BMP should form an annexure of the operational EMPr for the facility. A Draft Biodiversity Offset Strategy has been developed as part of the BAR, please see Appendix E.
- A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding. This programme will reduce the amount of available vulture food on site and reduce vulture-turbine collision risk. This programme will require the deployment of a dedicated (i.e. no other tasks) and adequately resourced (transport, binoculars, GPS, cameras, training) team of staff to patrol the full site during all daylight hours. This team will need to have a vehicle and the appropriate equipment to be able to dispose of large dead animals off site. This programme must be operational by the time the first turbine blades are turning on site and should not wait for COD. A full detailed protocol for this programme is included as Appendix 10 of the Avifaunal Impact Assessment and must be updated and included in the BMP/EMPr. This programme should, if possible, be combined with the initiation of a 'vulture restaurant' a suitable distance off site – where vultures are fed (and the above-mentioned carcasses are disposed of) in order to provide an attraction for vultures away from the turbines.
- An observer or technology led turbine Shutdown on Demand (SDOD) programme must be implemented on site from COD. In South Africa, observer led SDOD has recently shown promise at an operational wind farm in the Western Cape. It is likely that by the time of construction of the proposed project more experience on this mitigation will be available in country. This is required in order to mitigate the risk of turbine collision for Cape Vulture in particular, but will also address risk to other species. If an observer led programme is used, this programme must consist of a suitably qualified, trained and resourced team of observers present on site for all daylight hours 365 days of the year. This team must be stationed at vantage points with full visible coverage of all turbine locations. The observers must detect incoming priority bird species, track their flights, judge when they enter a turbine proximity threshold, and alert the control room to shut down the relevant turbine until the risk has reduced. A full detailed protocol is included in Appendix 11 of the Avifaunal Impact Assessment and must be updated and included in the BMP/EMPr. If a technology led option is used, preference should be given to a system that has been independently reviewed for efficacy. We crudely estimated how many shutdowns could be expected based on pre-construction monitoring data. When Cape Vulture flight paths are clipped to a 500m

proximity to the current turbine layout, 26 records were made in 360 hours of observation. This translates into a passage rate of 0.072birds/hr. Converting this to a year results in approximately 315 shutdown events per year. At an assumed 10 minutes shutdown at 1 turbine per event, this means 3 150 minutes of turbine downtime in a year. The facility of 36 turbines will operate for a total of 18 921 600 minutes per year (24hrs x 60 minutes x 365days x 36 turbines) this equates to 0.01% lost operating time. Even if the estimate is wrong and the real loss is ten times higher, it would be 0.1%. EDFR has confirmed that this is acceptable to them.

- One blade on each turbine must be painted subject to Civil Aviation Authority and turbine manufacturer regulations. Provision must be made by the developer for the resolution of any technical, warranty, supplier challenges that this may present. If this cannot be resolved, the developer will be responsible for substituting this with a suitable alternate mitigation measure in consultation with the ornithologist.
- Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off site. The facility will need to address other sources of mortality of priority species in a measurable way (according to best practice) so as to compensate for residual effects on the facility itself. An example of such off-site mitigation could be the retrofitting of insulation onto existing Eskom power lines in the project vicinity which pose an electrocution risk to vultures. This is a measurable impact which is not currently mitigated adequately by Eskom due to the cost. The project could contribute to the cost of such mitigation. Note: in April-May 2023 it was decided between the EAP, ecological specialist and avifaunal specialist that the presence of CBA1 areas on site triggered the need for an offset. Since the main trigger for this is Cape Vulture, a Cape Vulture offset plan was developed and will be implemented.
- No internal medium voltage power lines (33kV) should be overhead. All such cables should be buried along road verges. Only the 132kV lines from the switching station to the existing Qolweni Substation should be above ground. One exception has been granted for a 33 kV Overhead Line from Ngxwabangu to Ncora, within the assessed 132 kV Overhead Line corridor. This line will be shielded by the taller 132kV line and will pose minimal collision risk.
- For both collision and electrocution on power lines, the first and foremost approach to mitigation should be the selection of the shortest and most sensible possible length of new overhead power line to be constructed and the optimal route for this line.
- To mitigate for collision of the relevant species, it is recommended that the conductors on the high bird collision risk sections of the line be fitted with the best available (at the time of construction) Eskom approved anti bird collision line marking device. This should preferably be a dynamic device, i.e. one that moves as it is believed that these are more effective in reducing collisions, especially for bustards (see Shaw 2013), which are one of the key species (Denham's Bustard) in this area. It is recommended that a durable device be used as this area is clearly prone to a lot of strong wind and dynamic devices may be susceptible to mechanical failure. It will be either EDFR or Eskom's responsibility to ensure that these line marking devices remain in working order for the full lifespan of the power line, as we cannot afford to have significant numbers of bird collisions on this new line. It is important that these devices are installed as soon as the conductors are strung, not only once the line is commissioned, as the conductors pose a collision risk as soon as they are strung. The devices should be installed alternating a light and a dark colour to provide contrast against dark and light backgrounds respectively. This will make the overhead cables more visible to birds flying in the area. Note that 100% of the length of each span needs to be marked (i.e. right up to each tower/pylon) and not the middle 60% as some guidelines recommend. This is based on a finding by Shaw (2013) that collisions still occur close to the towers or pylons. It is also recommended that the stay wires on the met masts on site be installed with these devices as soon as possible.
- In the case of bird electrocution, the power line must be built on an Eskom approved bird-friendly pole structure which provides ample clearance between phases and phase-earth to allow large birds such as vultures to perch on them in safety. This typically means a phase-phase and phase-earth typical clearance of at least 1800mm, and a Bird Perch on top of any monopoles.
- The monitoring programme compiled for construction and post construction, outlined in Appendix 9, should be implemented according to the latest available version of the best practice guidelines at the

time. The findings from operational phase monitoring should inform an adaptive management programme to mitigate any impacts on avifauna to acceptable levels.

8.3 BAT IMPACT ASSESSMENT

STUDY	**Bat Impact Assessment, based on 12-month Pre-Construction Monitoring Campaign**
SPECIALIST	**Caroline Lötter**
COMPANY	**Inkululeko Wildlife Services**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F**

8.3.1 CONCLUSION & SPECIALIST STATEMENT

WITHOUT MITIGATION the proposed Ngxwabangu WEF is expected to have a Low significant potential Under the currently proposed project layout, no turbines (including their full rotor swept area) encroach on High or Medium-High sensitive areas. In Medium sensitive areas, turbines must be subject to turbine curtailment as prescribed herein.

WITHOUT MITIGATION the proposed Ngxwabangu WEF is expected to have a Low significant potential impact on bat roosts and bat ecosystem services, a Medium significant potential impact on bat foraging, and a High significant potential impact in terms of turbine bat fatalities.

WITH DILIGENT, EFFECTIVE MITIGATION AS RECOMMENDED IN THIS REPORT, the WEF's potential impact on bat roosts and ecosystem services could be reduced to Insignificant, the potential impact on bat foraging could be reduced to Low, and the potential impact on bat turbine fatalities could be reduced to Medium.

Going forward, the feasibility of the prescribed curtailment for turbines in Medium sensitive areas should be tested prior to finalization of the project.

8.3.2 IMPACTS

The following impacts were raised in the Bat Report. For additional information please refer to Chapter 9 of this report and Chapter 7 of the Bat Report.

- Roost disturbance and/or destruction due to construction activities.
- Destruction, degradation, and fragmentation of and displacement from foraging habitat.
- Bat fatalities from collision with turbines, and potential population declines.
- Decline or loss of bat ecosystem services.
- Cumulative impact.

8.3.3 MITIGATION MEASURES

Key recommended bat impact mitigation measures for the WEF include the following:

- Avoid High sensitive areas. Currently, no proposed turbines (including their full rotor swept areas) encroach on High sensitive areas. Ensure that any new buildings, substation, BESS, construction camp, laydown areas, and possible quarry/ies avoid all High sensitive areas and instead, are positioned ideally in Medium sensitive areas.
- Minimize disturbance of Medium-High sensitive areas. Currently, no proposed turbines (including their full rotor swept areas) encroach on Medium-High sensitive areas.
- Implement curtailment of turbines in Medium sensitive areas, as soon as the first turbine is operational, below an initial cut-in speed of 5 m/s during temperatures of 12 °C or warmer for four hours after sunset from 1 June to 31 October, and from sunset to sunrise from 1 November to 31 May. The 5 m/s turbine cut-in wind speed represents the wind speed associated with approximately 50% of all bat activity recorded at 73-110 m above ground level in 2021/2022 by IWS.

- Minimize road impacts. Minimize the length and breadth of proposed roads, and thus minimize the clearing and disturbance of natural areas (including potential bat roosting habitat).
- Avoid blasting within 2 km of a confirmed roost.
- Minimize degradation of terrestrial habitat (potential bat foraging and roosting habitat). Implement and maintain effective invasive alien plant, stormwater, erosion, sediment, and dust control measures.
- Ensure that turbines can be fitted with bat detectors and deterrent devices. Turbine engineers must consult with bat specialists to incorporate the necessary turbine adaptations for this during the design phase, so there are no unexpected surprises or concerns after the turbines are built.
- Minimize artificial lighting on site. Apart from compulsory civil aviation lighting, minimize artificial lighting - especially high-intensity, steady-burning, sodium vapour, quartz, halogen, and other bright lights at sub-stations, offices, and turbines. All non-aviation lights should be hooded downward and directed to minimise horizontal and skyward illumination. Where possible, solar-powered motion-sensitive lights should be used.
- A detector(s) should be installed on the meteorological mast just before construction commences, and monitoring should occur throughout construction, during the first and second years of operation, and again during the fifth year of operation, and every fifth year thereafter.
- Adaptively manage bat fatalities by consulting the latest SABAA guideline for this (Aronson et al. 2020 or later), and the best available relevant scientific information. The specialist conducting the Year 1 and Year 2 operational monitoring should provide recommendations for adaptive management of the above strategy after the second year of operational monitoring. Allowance should be made in the financial provision for adaptive management and mitigation of bat fatalities.
- If the operational bat monitoring and data analysis are not conducted as per Aronson et al. 2020 (or later), and/or if the bat fatality threshold is exceeded (determined as per MacEwan et al. 2018 or later), improved bat fatality mitigation must be promptly implemented. Unless the WEF's operational bat monitoring data suggest otherwise, and/or unless there are other measures that have been proven to effectively mitigate bat fatalities at WEFs, turbine curtailment should be implemented below an initial cut-in speed of 7 m/s during temperatures of 12 °C or warmer for four hours after sunset from 1 June to 31 October, and from sunset to sunrise from 1 November to 31 May. The 7m/s turbine cut-in wind speed represents the wind speed associated with approximately 80% of all bat activity recorded at 73-110 m above ground level in 2021/2022 by IWS.
- Submit quarterly and annual bat fatality monitoring reports to SABAAP (the South African Bat Assessment Association Panel), EWT (the Endangered Wildlife Trust), and the DEFF (the national Department of Environment, Forestry and Fisheries).
- Forward all (live and fatality) bat monitoring data to the database recommended by SABAA to expand the scientific knowledge base for more informed decision making and mitigation.
- Rehabilitate disturbed terrestrial habitat and water resources (bat foraging habitat). Implement effective rehabilitation of disturbed terrestrial habitat and water resources based on consultation with an appropriate experienced specialist(s). Carefully manage alien vegetation, livestock grazing, and water points.

8.4 Ecological Impact Assessment

STUDY	**Ecological Impact Assessment**
SPECIALISTS	**Dr Ted Avis, Ms Greer Hawley, Ms Nicole Wienand and Ms Elena Reljic**
COMPANY	**CES**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F**

8.4.1 Conclusion & Specialist Statement

The project area occurs within three (3) vegetation types, namely Drakensberg Foothill Moist Grassland, South Africa's grasslands are a remarkable and irreplaceable biodiversity asset of global significance (SANBI, 2013). The grasslands of the project area are no exception and contain high biodiversity which underpins

important ecosystem services such a water filtration, carbon sequestration, nutrient cycling, erosion prevention, and the provision of natural resources and ecological infrastructure that supports the surrounding villages. Therefore, should the proposed development be authorised, it is important to ensure that ecological corridors and processes operating within the landscape are maintained to ensure the health of the surrounding grassland ecosystems and the continued provision of ecosystem services.

According to SANBI (2013), the best practices and minimum ecological requirements for managing grasslands for biodiversity, and ultimately the continued provision of ecosystem services, include:

- Managing fire: Fire is a major ecological driver within grassland ecosystems and the incorrect application, or the absence of burning, could result in a shift in species composition, infestation of alien invasive species, bush encroachment, an increase in densely tufted or annual grass species, a decline in basal cover and an associated increase in soil erosion. The prolonged absence of fire (>5 years) can permanently damage grasslands as the accumulation of organic matter prevents the establishment and growth of new plants (SANBI, 2013). This can result in erosion and the loss of topsoil and ultimately the seed bank over the long term. It is therefore recommended that a Fire Management Plan is drafted by a suitably qualified specialist and implemented during the operation of the proposed Ngxwabangu WEF.
- Managing grazing: In order to offset the impact of the development on the natural ecology of the project area, the Applicant could liaise with local community members and farmers and assist with the compilation and implementation of a grazing plan.
- Managing habitats and species: According to the Grassland Ecosystem Guidelines (SANBI, 2013), some of the best practices and minimum ecological requirements for managing habitats and species in grassland ecosystems (which are also incorporated in this report) include: (a) the management of alien invasive species, (b) control of bush encroachment through the appropriate management of fire and grazing, (c) maintain basal cover and prevent soil erosion; and (d) promote the persistence of habitats with high species diversity and endemism (in this case wetlands, forest patches and rocky outcrops).
- Managing soil erosion and physical disturbance: The best way to manage erosion is to prevent it from happening (SANBI, 2013). This can be done by maintaining basal cover and restoring areas that do not form part of the development footprint during the operational phase. The compilation and implementation of an Erosion Management Plan/ Method Statement has therefore been recommended in this report.

By implementing the above management measures and the mitigation measures specified in this report (Ecological Impact Assessment Report, Appendix D), the significance of most impacts on the ecology of the area can be reduced. However, the project area does occur within an area classified as a CBA 1 due to the presence of vultures. As such, and in line with the ECBCP (2019), an offset must be investigated for the area of influence lost due to the proposed development. The probability for success of the offset should be determined by a qualified avifaunal specialist, who should also be involved with the compilation of the required offset. This has been undertaken as a separate document to the Ecological Impact Assessment, please see Appendix E of the BAR.

8.4.2 IMPACTS

The following impacts were raised in the Ecological Impact Assessment Report. For more information, please refer to Chapter 9 of this report (BAR) or Chapter 6 of the Ecological Impact Assessment Report.

- Impacts on the terrestrial habitat of Strategic Water Source Area (SWSA).
- Loss of Drakensberg Foothill Moist Grassland (LC).
- Loss of Tsomo Grassland.
- Encroachment of construction activities within the Southern Mistbelt Forest patches.
- Loss of plant species for conservation concern.
- Loss of CBA and ESA.
- Habitat fragmentation and disruption of ecosystem processes.
- Establishment of alien plant species.

- Disturbance and/or death of herpetofauna and/or loss of habitats.
- Disturbance and/or death of mammals and/or loss of habitats.
- Disturbance and/loss of herpetofauna species of conservation concern.
- Disturbance and/or loss of mammal species of conservation concern.
- Disturbance and/or death of faunal species.
- Disturbance of ecosystem function and process/habitat fragmentation.
- Infestation of alien plant species.

8.4.3 MITIGATION MEASURES

All management/mitigation measures identified for the impacts associated with the proposed Ngxwabangu WEF must be incorporated into the EMPr and implemented during the relevant phases of the proposed development (please refer to Section 6.1 of the Ecological Impact Assessment for the recommended mitigation measures associated with each impact identified). Specific mitigation measures and recommendations that must be incorporated into the EA (if granted) include:

- All necessary permitting and authorisations must be obtained prior to the commencement of any construction activities.
- Forest patches must be delineated and declared no-go areas. There must be no construction activities within no-go areas. Furthermore, a 50 m buffer (at the minimum) must be established and demarcated prior to construction to prevent the encroachment of construction activities on forest patches.
- A faunal Search and Rescue must be undertaken directly prior to construction.
- A botanical micro-siting of the development footprint must be undertaken by a qualified botanist prior to construction. If populations of critically endangered, endangered, vulnerable or rare species are identified, the development footprint should be adjusted where feasible to avoid these populations.
- If populations of threatened SCC are identified and the footprint cannot be adjusted, permits for the removal/translocation of these species must be obtained by the relevant competent authority. SCC should be translocated to the nearest suitable habitat on the same property by a qualified horticulturalist.
- Protected plant species which are known to survive translocation must be relocated to nearest appropriate habitat on the same property by a qualified horticulturalist.
- An Erosion Management Plan/Method Statement must be developed prior to the commencement of construction activities in order to mitigate the unnecessary loss of topsoil and runoff.
- An Alien Invasive Management Plan/Method Statement must be compiled and implemented during all phases of the proposed development.
- Activities within 500 m of a wetland and 100 m of a watercourse must obtain the necessary Water Use Authorisation prior to the commencement of such activities.
- The temporary laydown areas must be located within previously disturbed areas where possible.
- The placement of turbines within wetlands must be avoided.
- The grasslands surrounding the development footprint (i.e. within the properties affected by the proposed WEF) should be managed to ensure the maintenance of biodiversity and ecosystem services (see Section 7.3 of the Ecological Impact Assessment).
- A member of staff should be appointed to walk the development footprint, directly prior to construction/vegetation clearance at the start of each day to ensure no faunal species are in harm's way. In the event that faunal species are encountered, these should be allowed to move away from the area safely. Slow moving species e.g. tortoises and cryptic species should be moved out of harm's way and into suitable neighbouring habitat.
- It is therefore recommended that a Fire Management Plan is drafted by a suitably qualified specialist and implemented during the operation of the proposed Ngxwabangu WEF.

8.5 HERITAGE IMPACT ASSESSMENT

STUDY	Heritage Impact Assessment
SPECIALIST	Nelius Kruger
COMPANY	Exigo/CES
QUALIFICATIONS	Specialist Declaration and CV, Appendix F

8.5.1 CONCLUSION & SPECIALIST STATEMENT

The cultural landscape of the Eastern Cape encompasses a period of time that spans millions of years, covering human cultural development from the Stone Ages up to recent times. It depicts the interaction between the first humans and their adaptation and utilization to the environment, the migration of people, technological advances, warfare and contact and conflict. Contained in its archaeology are traces of conquests by Bantu-speakers, Europeans and British imperialism encompassing the struggle for land, resources and political power. As such, the history and archaeology of the larger Eastern Cape Province is relatively well known but in the Ngxwabangu region little systematic archaeological research has been conducted and, as such the heritage landscape is somewhat of an enigma.

A careful analysis of historical aerial imagery and archive maps of Ngxwabangu – and particularly areas subject to this assessment – indicate a landscape that has been altered extensively by recent and historical ruralisation, potentially sterilising surfaces and subsurface of heritage remains.

Heritage resources occur in the Ngxwabangu WEF Project zones and some of these heritage receptors might be impacted on by the proposed project. WEF developments with linear and narrow components such as OHLs and access roads are generally considered to be lower-risk since localised and spatially confined heritage resources can easily be avoided by project design of individual turbine positions, pylon placements and service roads. As such, impacts can be mitigated and in the opinion of the author of this Archaeological Impact Assessment Report, the proposed project proceed from a culture resources management perspective, provided that mitigation measures are implemented where applicable, and provided that potential previously undetected subsurface heritage remains encountered during any phase of development are subjected to a Chance Find Procedure as part of the EMPr.

8.5.2 IMPACTS

The following impacts were raised in the Ecological Impact Assessment Report. For more information, please refer to Chapter 9 of this report (BAR) or Chapter 6 of the Heritage Impact Assessment Report.

- Loss of Heritage Resources, Archaeology.
- Loss of Heritage Resources, Built Environment.
- Loss of Heritage Resources, Cultural Landscape.
- Loss of Heritage Resources, Human Burial Sites.

8.5.3 MITIGATION MEASURES

Sites of heritage potential and significance were noted in the two larger Ngxwabangu WEF Project areas. The following recommendations are made based on general observations in these proposed development zones in terms of heritage resources management.

- As information on the layout of the OHL corridors was made available to specialists at an advanced stage of this assessment where some these areas could not be included in the site surveys, ground-truthing of unsurveyed development footprint areas should be conducted during the finalisation of the EMPr and the project infrastructure layouts.
- Two possible later Iron Age Farmer Period stone walled sites in the Ngxwabangu Project Area (EXIGO-NWEF-IA01, EXIGO-NWEF-IA02) have the potential to inform on the spread of Iron Age communities in the interior of the Eastern Cape and the site is of medium heritage significance. The sites are situated

away from project infrastructure components and impact on the sites seem unlikely. Conservation buffers of at least 100m around the sites should be implemented and the areas should be monitored on a frequent basis by an informed ECO in order to avoid the destruction of existing and previously undetected heritage remains. Should impact on the sites prove inevitable it should be adequately documented by means of a Phase 2 Specialist Study. Such a study should minimally include the mapping, documentation and possible sampling of the site in order to conserve the historical fabric of the heritage resource. The necessary alteration and/or destruction permits should be obtained from the relevant Heritage Resources Authorities prior to site sampling and destruction.

- The remains of Historical Period settlements in the Ngxwabangu and Ncora Project Areas (Exigo-NWEF-HS01 - Exigo-NWEF-HS08) are of low significance due to the poor state of preservation of many of the sites and features. Some of the settlements occur around and within areas demarcated for development of WTG 36 and its associated access roads as well as OHL Corridors and potential impact on the sites should be closely monitored to avoid the destruction of previously undetected heritage remains and human burials which might occur in association with the settlements.
- The remains of Historical Period structures and features in the in the Ngxwabangu and Ncora Project Areas (Exigo-NWEF-HP06 - Exigo-NWEF-HP13, Exigo-NWEF-HP15 - Exigo-NWEF-HP17, Exigo-NWEF-HP19 - Exigo-NWEF-HP29) are of low significance but it should be noted that human burials might occur around these settlements. Some of the features and sites occur around and within areas demarcated for development of WTG 36 and its associated access roads and OHL Corridors and potential impact on the sites should be closely monitored to avoid the destruction of previously undetected heritage remains. Here, 20m conservation buffers should be maintained around these features in order to avoid the destruction of previously undetected heritage remains.
- A ceremonial / ritual site was noted on a high ridge overlooking the Tsojana Dam (Site EXIGO- NWEF-FT01). The site is most probably of high social and cultural value to local residents and it infers a high heritage significance rating. The site occurs away from areas demarcated for development but potential impact on the sites should be monitored to avoid damage to the feature. In addition, the PP and Stakeholder Engagement Process should include consultation with local communities on the heritage and cultural significance of the site, possible indirect impacts (site access, conservation) and required management measures.
- Graves and burials identified in the Ngxwabangu Project Area (Site Exigo-NWEF-BP01 - Site Exigo-NWEF-BP10) are of high significance and some of sites occur in close proximity of areas demarcated for development of WTG 36 and its associated access roads as well as OHL Corridors. As a primary measure, Heritage Authority (SAHRA) guidelines require a conservation buffer of at least 50m around the burial sites and graves. Where construction or digging risk encroaching on this conservation buffer, a temporary construction barricade should be erected around burials at risk in order to clearly demarcate the locations of the burials. A site management plan detailing strict site management conservation measures should be compiled for all burials in the project area. All burials should be monitored on a bi-monthly basis by an informed ECO/ESO or by the heritage Specialist in order to detect any impact on the resource at the earliest opportunity.
- Should impact on any human burial prove inevitable, full grave relocations are recommended for these burial grounds. This measure should be undertaken by a qualified archaeologist, and in accordance with relevant legislation, permitting, statutory permissions and subject to any local and regional provisions and laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials (see Addendum B).
- As a large number of burial sites as well as a site of ritual importance have been located in the project area, it is recommended that the EIA public participation and social consultative process (PP and Stakeholder Engagement) address the possibility of further graves and ritual sites occurring in the project area.
- The term “Living Heritage” can broadly refer to a place of cultural heritage and sacred nature; with cultural attributions that are not generally physically manifested. Ritual and symbolic spaces and practices, and the material residues thereof convey an intangible cultural significance beyond the

physical site or artefact, where the meaning of the ritual area speaks directly of a sense of place and lived experience. Such sites might occur on the project area or it surroundings and due cognisance should be taken of these sites of "Living Heritage" in the cultural landscape. In addition, it is possible that groups, farmers and locals living in the area have occupied the region for many generations and have expressed long-term cultural associations with the region. Therefore, it is important to ascertain from these respondents whether there are any further undetected sites of cultural significance in the area to which they relate and / or attach cultural meaning.

- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. It is recommended that a Chance Find Procedure be included in the EMPR in order to outline measure for the accidental discovery of subsurface palaeontological, archaeological or historical material, or burials not previously documented.
- It is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the Study Area along water sources and drainage lines, fountains and pans would often have attracted human activity in the past. Also, since Stone Age material seems to originate from below present soil surfaces in eroded areas, the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits. Burials and historically significant structures dating to the Colonial Period occur on farms in the area and these resources should be avoided during all phases of construction and development, including the operational phases of the development.

8.6 Noise Impact Assessment

STUDY	**Noise Impact Assessment**
SPECIALIST	**Mr Morné de Jager**
COMPANY	**Enviro Acoustic Research**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F**

8.6.1 Conclusion & Specialist Statement

It is critical that the applicant confirm the status of the structures (NSR) located within the 42 dBA noise level contour. The applicant must select appropriate mitigation measures to ensure that the noise levels at these NSR are less than 45 dBA if these structures are used for residential purposes.

Because the total projected noise levels will exceed the rural rating levels, with the projected noise level exceeding 42 dBA, active noise monitoring is recommended. Noise measurements are recommended:

- At selected NSR staying within 1,000 m from locations where night-time construction activities will be taking place (monthly measurements, during active night-time construction activities); and
- At selected NSR located within the 42 dBA noise level contour before the WEF is developed, to be repeated once the WEF is fully operational (once-off before, and during the operational phase).

The layout may not be acceptable in terms of acoustics, when using a WTG with a SPL of 109.2 dBA (re 1 pW) as operational noise levels will exceed 45 dBA at a number of NSR. The layout however will be acceptable if the Applicant use a WTG with a SPL of 106.5 dBA (re 1 pW) or less.

While there may be a noise impact of high significance during the operational phase (medium for night-time construction activities), this can be reduced to a low significance with the implementation of the recommended mitigation measures. If the applicant can reduce the noise levels to less than 45 dBA at all receptors (structures used for residential purposes), it is recommended that the proposed Ngxwabangu WEF and associated infrastructure project be authorized.

Therefore, proposed layout (i.e., turbine placement) will be acceptable (from a noise perspective) on the condition that the applicant either:

- Select a quieter WTG, and/or,
- Relocation of selected NSR, and/or,
- The use of a noise abatement programme as recommended.

No further noise studies are required (if the layout does not change), although it is recommended that the applicant implement a noise monitoring programme as recommended in this report.
It should be noted that the applicant must re-evaluate the noise impact:

- Should the layout be revised where:
    - Any WTG, located within 1,000 m from an identified and verified NSR, are moved closer to the NSR;
    - Any new WTG are introduced within 1,500 m from an identified and verified NSR;\
    - The number of WTG within 2,000 m from any identified and verified NSR are increased; and
- Should the applicant make use of a wind turbine with a maximum SPL exceeding 109.2 dBA re 1 pW.

To ensure that noise does not become an issue for future residents, landowners or the local communities, it is recommended that the applicant get written agreement from current land owners/community leaders that:

- No new residential dwellings will be developed within areas enveloped by the 42 dBA noise level contour, and
- Structures located within the 45 dBA noise level contour not be used for residential use.

8.6.2 IMPACTS

This study considers the potential noise impact on the surrounding environment due to the construction, operational and future decommissioning activities associated with the Project. It makes use of conceptual scenarios to develop noise propagation models to estimate potential noise levels. Considering the ambient sound levels measured onsite, the proposed noise limits as well as the calculated noise levels, it was determined that the significance of the potential noise impacts would be:

- Of a low significance for the daytime construction of the access roads;
- Of a low significance for the daytime construction traffic passing NSRs;
- Of a low significance for the daytime construction activities (hard standing areas, excavation and concreting of foundations and the erection of the wind turbines and other infrastructure);
- Of a medium significance for the night-time construction activities. Mitigation is available to reduce the significance of the noise impact to low;
- Of a low significance for daytime operational activities (noises from wind turbines) when considering the worst-case SPL; and
- Of a high significance for night-time operational activities (noises from wind turbines) when considering the worst-case SPL, with mitigation available to reduce the significance of the night-time noise impact to low..

8.6.3 MITIGATION MEASURES

The noise impact will be of a low significance during the day, though night-time construction activities (erection of turbine, concrete pouring of foundation) may have a noise impact of a medium significance. The medium significance impact relates to the worst-case scenario being investigated, with numerous simultaneous activities taking place at locations where WTGs are proposed. It is recommended that the applicant (relevant to night-time construction activities):

- Plan the construction schedule to ensure that simultaneous activities are only required at one WTG location (when simultaneous construction activities are required at more than one location closer than 1,000m from an NSR). Other simultaneous construction activities can continue, but should take place further than 1,000m from NSRs at night; and

- Minimise active equipment at night, planning the completion of noisiest activities (such a pile driving, rock breaking and excavation) during the daytime period.

The significance of the noise impact during the operation phase could be high when considering the worst-case SPL WTG. Noise levels at NSR 40, 46 and 47 is higher than 45 dBA and mitigation is recommended to reduce the noise levels if these structures will be used for residential purposes in the future. Potential options to reduce the noise impact include:

- The applicant must confirm the status of the structures where noise levels exceed 42 dBA (during the operational phase), confirming whether it is used for residential purposes. People staying in structures where calculated noise levels exceed 45 dBA could be relocated, or the applicant can select appropriate mitigation measures to ensure that the total noise levels are less than 45 dBA at the closest NSR, which could include (one or a combination of):
    - The applicant can select a WTG with a lower SPL (e.g., a WTG with a SPL less than 106.5 dBA re 1 pw); or
    - The layout must be changed to locate WTG further from NSR, considering the potential cumulative effect of all WTG located within 2,000 m from NSR; or
    - The applicant can develop a noise abatement program to reduce the noise emission levels (when using a WTG that offer such an option) at certain wind speeds, and/or if the wind blows in a certain direction.

8.7 PALEONTOLOGICAL IMPACT ASSESSMENT

STUDY	**Paleontological Impact Assessment**
SPECIALIST	**John Almond**
COMPANY	**Natura Viva**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F**

8.7.1 CONCLUSION & SPECIALIST STATEMENT

Ngxwabangu Wind Power (Pty) Ltd is planning to develop, construct and operate a 260 MW Wind Energy Facility (WEF) and associated Grid Connection (up to 22 km long) on a site approximately 15 km north of the small town of Cofimvaba in the Chris Hani District Municipality of the Eastern Cape Province.

Large portions of the Ngxwabangu WEF and Grid Connection project areas are underlain by potentially fossiliferous continental sediments of the Burgersdorp Formation (Tarkastad Subgroup, Beaufort Group, Karoo Supergroup) of Early Triassic age as well as by unfossiliferous Karoo dolerite. However, the Burgersdorp Formation bedrocks here are generally highly-weathered near-surface, their fossil content has been compromised by thermal and chemical alteration due to nearby dolerite intrusion, while bedrock exposure levels are very low indeed. No fossil sites at all were recorded within the project areas during a recent two-day palaeontological site visit, neither within the Triassic bedrocks nor associated with the overlying mantle of Late Caenozoic superficial sediments (e.g. Pleistocene to Recent Masotcheni Formation slope deposits, lateritic and other soils). Good exposures of Burgersdorp beds observed locally along the banks of the Tsomo River would be spanned by the proposed transmission line. The provisional Very High Palaeosensitivity of much of the project areas is according contested. The entire combined WEF and Grid Connection project area is rated here as being of Very Low Palaeosensitivity in practice.

Anticipated impacts on local palaeontological heritage during the construction phase of the WEF and Grid Connection are accordingly Very Low to Negligible. This assessment applies to all the infrastructure components listed in the project descriptions. Provided that the Chance Fossil Finds Protocol tabulated in Appendix 2 of the Paleontological Impact Assessment Report is incorporated into the EMPrs and fully implemented during the construction phase of the WEF and Grid Connection developments, no further

specialist palaeontological studies, monitoring or mitigation are recommended for these projects. The professional palaeontologist involved in any construction phase mitigation work would need to apply beforehand for a Fossil Collection Permit from the Eastern Cape Provincial Heritage Resources Agency, ECPHRA (Contact details: Mr Sello Mokhanya, 74 Alexander Road, King Williams Town 5600; Email: smokhanya@ecphra.org.za).

The proposed WEF and electrical infrastructure developments are not fatally flawed, and there are no objections on palaeontological heritage grounds to their authorisation.

8.7.2 Impacts

Anticipated impacts on local palaeontological heritage during the construction phase of the WEF and Grid Connection are accordingly Very Low to Negligible.

8.7.3 Mitigation Measures

Anticipated impacts on local palaeontological heritage during the construction phase of the WEF and Grid Connection are accordingly Very Low to Negligible. The WEF must include a Chance Find Palaeontology Management Plan as part of the EMPr, prior to construction. This has been appended to the Palaeontological Impact Assessment as Appendix 2.

8.8 Socio-Economic Impact Assessment

STUDY	**Socio-Economic Impact Assessment**
SPECIALIST	**Matthew Keeley**
COMPANY	**Urban Econ**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F**

8.8.1 Conclusion & Specialist Statement

This study has presented a baseline socio-economic perspective of the greater area and nearby communities in which to proposed WEF is intended to be developed and operated. The baseline assessment has revealed that the study area and the communities that reside within the greater Ngxwabangu area are highly impoverished with limited inherent potential or latent competitive advantages on offer to stimulate economic and social wellbeing in the foreseeable future.

The average household residing in the study area is found to be twice as poor compared to the average household residing in the Chris Hani District and 2.7 times poorer than the average Eastern Cape household. Unlike the Eastern Cape as a whole which sees a steady annual population growth, the population of the study area has been declining year on year (1.3% p.a) as the youth migrate in search of employment opportunities that do not present themselves locally. Less than one in four working-aged individuals in the study area are engaged in formal employment, which speaks to the heavy reliance on informal economic activity and social grants to sustain livelihoods. Without the potential for formal local employment, the youth have become discouraged and in addition to a lack of adequate education and schooling, this has resulted in a population where less than one in eight individuals have obtained a matric certificate.

Engagements with local traditional leaders coupled with site visits undertaken by the project team have revealed that state supported enterprise and economic development projects mostly in the agricultural and tourism sectors have realised very limited benefits to the community at large. Inadequate investment, lack of maintenance, coupled with beneficiaries that lack adequate business acumen and necessary mentorship and support have resulted in projects that fail to sustain themselves as viable business enterprises.

The above described demographic and economic realities of the area, emphasise the importance of identifying other means of economic activity that can reverse the economic and social ills of the area. This study has found that the proposed WEF can result in immediate short-term and long-term sustained socio-economic benefits to the local area.

The proposed project can also serve as a flag-bearer for future WEF developments in the former Transkei and eastern regions of the Eastern Cape Province, areas which face many of the same social and economic realities found in greater Ngxwabangu. The proposed project would be the first of its kind within the Eastern Cape to be developed and operated on communal land, all 16 of the previously awarded WEF's in the Eastern Cape are operating on private, municipal or community property association (CPA) land.

A key facet that would come about with the implementation of this project is that of community ownership and empowerment. Although the developer is compelled to deliver on its commitments regarding enterprise and socio-economic development, this project would also see the community – represented by their traditional leadership councils – obtaining ongoing 'rental income' for the placement of turbines within their communal areas. Unlike many of the other underperforming initiatives in the study area, this would bring about guaranteed sustainable income for local people over the next +20years.

The above sustainable income potential coupled with the developer's intentions to put in place training and skills transfer programs to ensure the community is empowered to efficiently participate in the direct and indirect opportunities that come about from the project are anticipated to deliver on the vision and objectives set out in the National Development Plan, down to the inclusivity and capacitation agenda of local peoples highlighted in the IYLM LED Strategy.

In conclusion, from a socio-economic perspective the proposed Ngxwabangu WEF project is deemed to be a highly suitable and desirable investment into the local, regional and national economy.

8.8.2 IMPACTS

The following impacts have been identified and assessed in the SIA. Please refer to Chapter 9 of this report (EIR) and to Chapter 4 of the SEIA for more information.

- Temporary stimulation of the national and local economy.
- Temporary increase in employment in the study area, regional and national economies.
- Contribution to skills development in the study area and regional economy.
- Temporary increase in household earnings.
- Temporary increase in government revenue.
- Temporary increase in social disruptions associated with the influx of labour and job seekers.
- Impact on economic and social infrastructure.
- Changes to the area's sense of place.
- Sustainable increase in production and GDP in the study area, regional area and nationally.
- Creation of sustainable employment positions nationally and locally.
- Skills development of permanently employed workers.
- Improved standards of living for benefiting households.
- Sustainable increase in regional and national government revenue.
- Provision of electricity necessary for economic growth.
- Local socio-economic development and economic diversification benefits derived from the project's operations.
- Negative changes to the sense of place.

8.8.3 MITIGATION MEASURES

The following mitigation measures are proposed:

- The wind energy facility developer, EDF Renewables, should prescribe that the EPC contractor prioritises local procurement of goods and services where possible from nearby sourcing hubs being Komani and Mthatha. This will be limited to more general construction related goods and services as well as generic machinery.
- The EPC should also be encouraged to raise awareness amongst local businesses as well as aspiring entrepreneurs within the study area prior to the construction taking place. Awareness should extend to catering companies as well as accommodation businesses in the nearby towns and generic construction businesses as mentioned above.
- Sub-contract to local construction and transport companies particularly MSME's, B-BBEE compliant and women-owned enterprises where possible.
- Use local suppliers where feasible and arrange with the local MSME's to provide transport, catering and other services to the construction crews.
- Co-ordinate and arrange local community meetings through the Instika Yethu local municipality, labour unions and local traditional councils to advise the local labour force about the proposed project and the jobs that can potentially be applied for.
- Establish numerous local skills desks to determine the potential skills that could be sourced from the area. Skills desks could be located at the stone quarry and the Lubisi conference centre found in the Mcambalala traditional council as well as the local clinic found within the proposed study area as well as in nearby towns such as Cofimvaba and Komani.
- Recruit local labour as far as feasible.
- Provide the local labour force with necessary training prior to the construction phase.
- Employment of labour-intensive methods in construction where feasible.
- Facilitate knowledge and skills transfer between highly specialised technical experts and South African professionals during the pre-establishment and construction phases.
- Provide basic construction training to recruited local members before the construction phase takes place.
- Set up apprenticeship programmes to build onto existing skill levels or develop new skills amongst construction workers especially those from the local communities.
- Recruit local labour as far as feasible to increase the benefits to the local households.
- Employ labour intensive methods in construction where feasible.
- Sub-contract to generic local construction companies where possible.
- Use local suppliers where feasible and arrange with local MSME's and B-BBEE compliant enterprises to provide transport, catering and other services to the construction crews.
- Set up a recruitment office in the nearby towns (such as Cofimvaba and Komani) and adhere to strict labour recruitment practices that would reduce the desire of potential job seekers to loiter around the area in the hope of finding temporary employment.
- Control the movement of workers between the site and areas of temporary residence to minimise loitering around the site. This should be achieved through the provision of scheduled transportation services between the construction site and area of residence.
- Involve the traditional leaders from the four administrative areas of the study area to inform the EPC contractor and the proposed development team at large about the cultural and religious land practices that are followed in the study area.
- The traditional leaders should be encouraged to assign a reliable person in their respective administration area to deal with complaints of their community members.
- Employ locals as far as feasible through the creation of a local skills database.
- Establish a management forum comprising of key stakeholders to monitor and identify potential problems that may arise due to the influx of job seekers to the area.
- Ensure that any damages or losses to nearby buildings that can be linked to the conduct of construction workers are adequately reimbursed.
- Assign a dedicated person to deal with complaints and concerns of affected parties.
- Provide adequate signage along relevant road networks to warn the motorists of the construction activities taking place on the site.

- Engage with local authorities and inform them of the development as well as discuss with them their ability to meet the additional demands on social and basic services created by the in migration of workers.
- Where feasible, assist the municipality in ensuring that the quality of the local social and economic infrastructure does not deteriorate through the use of social responsibility allocations.
- The developer and EPC contractor should ensure prior to the construction phase that they make use of their own mobile social services and economic infrastructure as far as possible, i.e., the use of a mobile clinic on site for the construction team as well as a generator for their own electricity supply as well as water tanks and boreholes as suitable water sources.
- The mitigation measures proposed by the visual and noise specialists should be adhered to.
- Natural environments that are not affected and needed by the proposed development should remain untouched. Regulations of boundaries of such areas need to be made transparent between the local community's leaders, the developer and EPC contractor prior to the development's construction phase. Efforts should also be made to avoid disturbing such sites during construction.
- The operator of the wind energy facility and its related infrastructure should be encouraged to, as far as possible, procure materials, goods and products required for the operation and maintenance of the facility from local suppliers to increase the positive impact in the local economy.
- Aspiring entrepreneurs from the local communities should be encouraged to formally register their MSMEs in order to do business with the IPP- this would specifically apply to MSMEs within the security and cleaning/cleansing sub-industries.
- Where possible, local labour should be considered for employment to increase the positive impact on the local economy.
- Only source Cape Vulture and other live birds and animal spotters from the immediate study area.
- As far as possible, local small and medium enterprises should be approached to investigate the opportunities for supply inputs required for the maintenance and operation of the wind energy facility and related infrastructure.
- The developer should consider establishing vocational training programmes for the local labour force to promote the development of skills required by the wind energy facility and their related infrastructure and thus provide for the opportunities for these people to be employed in other similar facilities elsewhere.
- Where possible, the local labour supply should be considered for employment opportunities to increase the positive impact on the area's economy.
- As far as feasible, local small and medium enterprises should be approached to investigate the opportunities for supply inputs required for the maintenance and operation of the wind energy facility and their related infrastructure.
- An innovative and site-specific ED and SED programme should be devised by the developer and regularly updated throughout the project's lifespan.
- Recommend and advertise accommodation at the Lubisi Lodge and Conference centre for overnight stays and hosting meetings and conferences related to the proposed development or for other business ventures and educational tourism expeditions.
- The developer should encourage the operational manager and team to be open to hosting safe site visits for local schools and colleges for educational purposes.
- The plan should be developed in consultation with local authorities and local communities to identify community projects that would result in the greatest social benefits.
- These plans should be reviewed on an annual basis and, where necessary, updated.
- When identifying enterprise development initiatives, the focus should be on creating sustainable and self-sufficient enterprises.
- In devising the programmes to be implemented, the developer should take into account the priorities set out in the local IDP.

8.9 VISUAL IMPACT ASSESSMENT

STUDY	Visual Impact Assessment
SPECIALISTS	Peter Velcich, Tosca de Villiers and Bryony van Niekerk
COMPANY	NuLeaf
QUALIFICATIONS	Specialist Declaration and CV, Appendix F

8.9.1 CONCLUSION & SPECIALIST STATEMENT

The visual assessment indicates that the construction and operation of the proposed Ngxwabangu WEF will have a very high visual effect on both the rural landscape and on sensitive receptors in the study area. The visual impact will differ amongst places, depending on the distance from the facility, but it is expected to be of the highest significance within (but not restricted to) a 5km radius of the proposed facility. Within this distance it will generally be restricted to residents of villages / settlements, as well as, observers travelling along the various secondary roads. This is largely due to the relatively close distance between the observers and the wind turbines, as well as, the elevated location of the turbines.

Overall, the significance of the visual impacts is predominately moderate to high, as a result of the generally rural character of the landscape and the abundant villages / settlements located within the study area (increasing the number of sensitive receptors affected). A significance of very high is expected on sensitive receptors in close proximity (within 5km) of the proposed facility during the operational phase. Some impacts, post mitigations (if applicable), are expected to be of high significant (visual impacts on sensitive receptors within the local area between 5 - 10km offset, shadow flicker, visual quality of the landscape and the cumulative impact), moderate significance (visual impacts of construction, on sensitive receptors within the within the district between 10 - 20km offset, lighting at nights and ancillary infrastructure) and others low significance (visual impacts on sensitive receptors within the region beyond the 20km offset). The facility would be visible within an area that contains certain sensitive visual receptors who would consider visual exposure to this type of infrastructure to be intrusive. Such visual receptors include people travelling along roads and residents of the numerous villages / settlements scattered throughout the region.

With regards to the shadow flicker likely to be experienced by homesteads located on the outskirts of the identified villages / settlements that are located nearby, it is recommended that further consultation is undertaken as part of the BA consultation process with these specific affected sensitive receptors, in order to establish their understanding and concerns regarding this possible impact. Should it be found during the consultation process that these specific receptors are concerned with the impact associated with shadow flicker, it is then recommended that the positioning of these specific turbines be revised or removed.

Conventional mitigation (e.g., such as screening of the structures) of the potential visual impacts is highly unlikely to succeed due to the nature of this type of development (tip height exceeding 100m) and the receiving environment. However, a number of best practice mitigation measures have been proposed (Section 7.4 of the VIA) in order to limit the impacts that can be mitigated. Additionally, irrespective of whether or not mitigation measures will reduce the significance of the anticipated visual impacts, they are considered to be best practice and should all be implemented and maintained throughout the construction, operation and decommissioning phases of the proposed facility, should it be authorized. Impacts deemed possible to mitigate are general lighting of the facility and the construction activities on sensitive receptors in close proximity of the proposed facility.

In order to ensure that all the spatial analyses and mapping undertaken in this report is as accurate as possible, a transparent and scientifically defensible approach, in line with best practice methodology for this type of assessment, has been utilised. The objective of this process is to quantify the potential visual impacts associated with the proposed Ngxwabangu WEF, using visibility analyses, proximity analyses and the identification of sensitive receptors. However, it must be noted that visual impact is a very subjective

concept, personal to each individuals' backgrounds, opinions and perceptions. The subjects in this case are the identified sensitive receptors such as the residents of the numerous villages / settlements, observers travelling along public roads and visitors to the region.

According to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for Involving Visual and Aesthetic Specialists in the EIA Process (Oberholzer, 2005), the criteria that determine whether or not a visual impact constitutes a potential fatal flaw are categorised as follows:

1. Non-compliance with Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites.
2. Non-compliance with conditions of existing Records of Decision.
3. Impacts that may be evaluated to be of high significance and that are considered by the majority of the stakeholders and decision-makers to be unacceptable.

In terms of the above and to the knowledge of the author the proposed development is compliant with all Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites, as well as, conditions of existing Records of Decisions (if applicable).

Since no reported objections from stakeholders or decision-makers within the region have been communicated by the EAP to the author of this report, this assessment has adopted a risk averse approach by assuming that the perception of most (if not all) of the sensitive visual receptors (bar the landowners of the properties earmarked for the development), would be predominantly negative towards the development of a WEF in the region. While still keeping in mind that there are also likely to be supporters of the Ngxwabangu WEF (as renewable energy generation is a global priority) amongst the population of the larger region, but they are largely expected to be indifferent to the construction of the WEF and not as vocal in their support for the wind farm as the detractors thereof.

Therefore, with the information available to the specialist at the time of writing this report, it cannot be empirically determined that the statistical majority of objecting stakeholders were exceeded. If evidence to the contrary surfaces during the progression of the development application, the specialist reserves the right to revise the statement below.

In spite of the predominantly high residual ratings (as assessed in Section 7) and the likelihood that the proposed development will be met with concern and objections from some of the affected sensitive receptors and landowners in the region, this report cannot categorically state that any of the above conditions were transgressed. As such these visual impacts are not considered to be fatal flaws for a development of this nature. It is, therefore, suggested that the proposed Ngxwabangu WEF, as per the assessed layout be supported from a visual perspective, subject to the implementation of the suggested best practice mitigation measures, as provided in this report.

8.9.2 IMPACTS

The following impacts were identified and assessed as part of the VIA. Please refer to Chapter 9 of this report (EIR) and Chapter 7 of the VIA for more information.

In light of the results and findings of the Visual Impact Assessment undertaken for the Ngxwabangu WEF proposed, it is acknowledged that the receiving environment will be significantly visually transformed for the entire operational lifespan of the facility.

The following is a summary of the impacts assessed:

- The potential visual impact of construction on sensitive visual receptors in close proximity to the facility is likely to be of high significance before mitigation and moderate significance post mitigation.

- The potential visual impact of construction lighting on sensitive visual receptors in close proximity to the facility is likely to be of high significance. No mitigation is possible.
- The potential visual impact of facility operations on sensitive visual receptors (i.e., residents of villages / settlements, as well as, observers travelling along the various secondary roads), in close proximity (within 5km) to the proposed facility is likely to be of very high significance. No mitigation is possible for a facility of this scale.
- The potential visual impact of facility operations on sensitive visual receptors (i.e., users of the various secondary road, visitors to region, and residents of villages / settlements) within the local area (between 5 - 10km offset) to the proposed facility is likely to be of high significance. No mitigation is possible for a facility of this scale.
- The potential visual impact of facility operations on sensitive visual receptors (i.e., users of the various secondary road, arterial R61 road, visitors to region, and residents of villages / settlements) within the district (between 10 - 20km offset) to the proposed facility is likely to be of moderate significance. No mitigation is possible for a facility of this scale.
- The potential visual impact of facility operations on sensitive visual receptors (i.e., users of the various secondary roads, arterial roads R61 and R359, visitors to the region, and residents of villages / settlements) within the region (beyond the 20km offset) to the proposed facility is likely to be of low significance. No mitigation is possible for a facility of this scale.
- The anticipated visual impact of operational lighting at night on sensitive visual receptors within the study area is likely to be of high significance and may be mitigated to moderate should the possible best practice mitigation measures be implemented and approval for changes to the CAA lighting is approved.
- The expected visual impact of shadow flicker on sensitive receptors in close proximity to the proposed development is likely to be of high significance.
- The expected visual impact of ancillary infrastructure on sensitive receptors in close proximity to the proposed development is likely to be of moderate significance.
- The potential visual impact of the proposed facility operations on the visual quality of the landscape and sense of place of the region is likely to be of high significance. No mitigation is possible for a facility of this scale.
- The cumulative visual impacts are likely to be of high significance when the proposed Ngxwabangu WEF is taken into consideration with the other authorised Renewable Energy Facilities within the study area.

8.9.3 MITIGATION MEASURES

The following mitigation measures were suggested as part of the VIA. Please refer to Chapter 9 of this report (EIR) and Chapter 7 of the VIA for more information.

The primary visual impact, namely the appearance of the Wind Energy Facility (the wind turbines) is not possible to mitigate. The functional design of the turbines cannot be changed in order to reduce visual impacts.

Alternative colour schemes (i.e., painting the turbines sky-blue, grey or darker shades of white) are not permissible as the CAA's Marking of Obstacles expressly states, "Wind turbines shall be painted bright white to provide the maximum daytime conspicuousness". Failure to adhere to the prescribed colour specifications will result in the fitting of supplementary daytime lighting to the wind turbines, once again aggravating the visual impact.

The overall potential for mitigation is therefore generally low or non-existent. The following mitigations are however possible:

- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Plan ancillary infrastructure (i.e., substation and workshop) in such a way and in such a location that clearing of vegetation is minimised. Consolidate existing infrastructure as much as possible, and make use of already disturbed areas rather than pristine sites wherever possible.

- Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible, and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- Access roads, which are not required post-construction, should be ripped and rehabilitated.
- No mitigation is possible for visual impacts associated with the on-site monitoring and telecommunications masts.
- The Civil Aviation Authority (CAA) prescribes that aircraft warning lights be mounted on the turbines. However, it is possible to obtain permission to mount these lights on the turbines representing the outer perimeter of the facility. In this manner, fewer warning lights can be utilised to delineate the facility as one large obstruction, thereby lessening the potential visual impact. It is therefore recommended that the possibility of this be investigated.
- Install aircraft warning lights that only activate when the presence of an aircraft is detected, if permitted by CAA.
- With regards to the shadow flicker likely to be experienced by homesteads located on the outskirts of the identified villages / settlements that are located nearby, it is recommended that further consultation is undertaken as part of the BA consultation process with these specific affected sensitive receptors, in order to establish their understanding and concerns regarding this possible impact. Should it be found during the consultation process that these specific receptors are concerned with the impact associated with shadow flicker, it is then recommended that the positioning of these specific turbines be revised or removed.
- Mitigation of visual impacts associated with the construction phase, albeit temporary, entails proper planning, management and rehabilitation of all construction sites. Construction should be managed according to the following principles:
    - Ensure that vegetation is not unnecessarily cleared or removed during the construction period.
    - Reduce the construction period through careful logistical planning and productive implementation of resources.
    - Plan the placement of lay-down areas and any potential temporary construction camps in areas where minimum vegetation clearing is needed.
    - Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
    - Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
    - Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
    - Where possible, restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
    - Ensure that all infrastructure and the site and general surrounds are maintained and kept neat.
    - Rehabilitate all disturbed areas, construction areas, roads, slopes etc. immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.
    - Monitor all rehabilitated areas for at least a year for rehabilitation failure and implement remedial action as required. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.
- Mitigation of other lighting impacts includes the pro-active design, planning and specification lighting for the facility. The correct specification and placement of lighting and light fixtures will go far to contain rather than spread the light. Additional measures include the following:
    - Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself);
    - Limiting mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights;

- Making use of minimum lumen or wattage in fixtures;
- Making use of down-lighters, or shielded fixtures;
- Making use of Low-Pressure Sodium lighting or other types of low impact lighting.
- Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.

- During Operations, monitor the general appearance of the facility as a whole, as well as, all rehabilitated areas.
  - The maintenance of the turbines and ancillary structures and infrastructure will ensure that the facility does not degrade, thus aggravating visual impact. Implement remedial action where required.
  - Where sensitive visual receptors are likely to be affected, it is recommended that the developer enter into negotiations regarding the potential screening of visual impacts at the receptor site. This may entail the planting of vegetation, trees or even the construction of screens. Ultimately, visual screening is most effective when placed at the receptor itself.
  - Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as a when required.
- After decommissioning, all infrastructure should be removed and all disturbed areas appropriately rehabilitated. Monitor rehabilitated areas post-decommissioning and implement remedial actions and consult an ecologist regarding rehabilitation specifications if necessary.

The possible mitigation of both primary and secondary visual impacts as listed above should be implemented and maintained on an on-going basis.

9 IMPACT ASSESSMENT

9.1 IMPACT ASSESSMENT METHODOLOGY

The following standard rating scales have been defined for assessing and quantifying the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. The identified impacts have been assessed against the following criteria:

Six factors are considered when assessing the significance of the identified issues, namely:

1. **Significance** - Each of the below criterion (points 2-6 below) are ranked with scores assigned, as presented in Table 1 to determine the overall significance of an activity. The total scores recorded for the effect (which includes scores for duration; extent; consequence and probability) and reversibility / mitigation are then read off the matrix presented in Table 9-1, to determine the overall significance of the issue. The overall significance is either negative or positive.
2. **Consequence** - the consequence scale is used in order to objectively evaluate how severe a number of negative impacts might be on the issue under consideration, or how beneficial a number of positive impacts might be on the issue under consideration.
3. **Extent** - the spatial scale defines the physical extent of the impact.
4. **Duration** - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
5. The **probability** of the impact occurring - the likelihood of impacts taking place as a result of project actions arising from the various alternatives. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident) and may or may not result from the proposed development and alternatives. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.
6. **Reversibility / Mitigation** – The degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. The four categories used are listed and explained in Table 9-1 below. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

The relationship of the issue to the temporal scale, spatial scale and the severity are combined to describe the overall importance rating, namely the significance of the assessed impact.

The impact is first classified as a positive (+) or negative (-) impact. The impact then undergoes an evaluation according to a set of criteria.

Table 9-1: Ranking of Evaluation Criteria.

Effect	**Duration**	
	Short term	Less than 5 years
	Medium term	Between 5-20 years
	Long term	More than 20 years
	Permanent	Over 40 years or resulting in a permanent and lasting loss
	Extent	
	Localised	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
	Study area	The proposed site and its immediate surroundings.
	Municipal	Impacts affect the Nelson Mandela Bay Metropolitan Municipality, or any towns within the municipality.
	Regional	Impacts affect the wider area or the Eastern Cape Province as a whole.
	National	Impacts affect the entire country.

	International/Global	Impacts affect other countries or have a global influence.
	Consequence	
	Slight	Slight impacts or benefits on the affected system(s) or party(ies)
	Moderate	Moderate impacts or benefits on the affected system(s) or party(ies)
	Severe/ Beneficial	Severe impacts or benefits on the affected system(s) or party(ies)
	Probability	
	Definite	More than 90% sure of a particular fact. Should have substantial supportive data.
	Probable	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
	Possible	Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.
	Unsure/Unlikely	Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.
Reversibility/ Mitigation	**Impact Reversibility / Mitigation**	
	Easy	The impact can be easily, effectively and cost effectively mitigated/reversed
	Moderate	The impact can be effectively mitigated/reversed without much difficulty or cost
	Difficult	The impact could be mitigated/reversed but there will be some difficultly in ensuring effectiveness and/or implementation, and significant costs
	Very Difficult	The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly

Table 9-2: Impacts Severity Rating

Impact severity *(The severity of negative impacts, or how beneficial positive impacts would be on a affected system or affected party)*	
Very severe	**Very beneficial**
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.
Severe	**Beneficial**
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. For example, the clearing of forest vegetation.	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. For example an increase in the local economy.
Moderately severe	**Moderately beneficial**
Medium to long term impacts on the affected system(s) or party (ies), which could be mitigated. For example constructing a sewage treatment facility where there was vegetation with a low conservation value.	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. For example a 'slight' improvement in sewage effluent quality.
Slight	**Slightly beneficial**
Medium or short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	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.

No effect	Don't know/Can't know
The system(s) or party(ies) is not affected by the proposed development.	In certain cases it may not be possible to determine the severity of an impact.

Table 9-3: Overall Significance Rating

OVERALL SIGNIFICANCE *(THE COMBINATION OF ALL THE ABOVE CRITERIA AS AN OVERALL SIGNIFICANCE)*	
VERY HIGH NEGATIVE	**VERY BENEFICIAL (VERY HIGH +)**
These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects. Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance. Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.	
HIGH NEGATIVE	**BENEFICIAL (HIGH +)**
These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light. Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated. Example: The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.	
MODERATE NEGATIVE	**SOME BENEFITS (MODERATE +)**
These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial. Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.	
LOW NEGATIVE	**FEW BENEFITS (LOW +)**
These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect. Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels. Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.	
NO SIGNIFICANCE	
There are no primary or secondary effects at all that are important to scientists or the public. Example: A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.	
DON'T KNOW	
In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information. Example: The effect of a development on people's psychological perspective of the environment.	

All feasible alternatives and the "no-go option" will be equally assessed in order to evaluate the significance of the "as predicted" impacts (prior to mitigation) and the "residual" impacts (that remain after mitigation measures are taken into account). The reason(s) for the judgement will be provided when necessary.

All impacts must have a "cause and comment", a significance rating before mitigation, after mitigation and for the no-go option. Impacts should also indicate applicable mitigation measure/ recommendations to reduce the impact significance.

9.1.1 CUMULATIVE IMPACT APPROACH

While individual development activities can have minor impacts, the combined impacts of many developments can have serious local, regional, and even global repercussions. In this regard, Appendix 1 section 3 on the BA Process included in the 2014 EIA Regulations as amended, indicates that a BAR must contain information that is necessary for the Competent Authority to consider and come to a decision on an application and must include:
(j) An assessment of each identified potentially significant impact and risk, including: (i) cumulative impacts.

The Regulations define cumulative impacts as follows: "cumulative impacts", in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

The International Finance Corporation (IFC) (2013:21) of the World Bank defines a Cumulative Effects Assessment (CEA) as the process of:

- Analysing the potential impacts and risks of proposed developments in the context of the potential effects of other human activities and natural environmental and social external drivers on the chosen [valued component] over time; and
- Proposing concrete measures to avoid, reduce, or mitigate such cumulative impacts and risks to the extent possible.

Ecological and socio-economic systems can absorb or adapt to change, but not indefinitely. The increased pace and intensity of development activities in many regions of the world, combined with increased concern for environmental protection, has elevated the importance of CEA and management in recent years. Governments, nongovernment organizations, and project proponents are seeking innovative ways to address cumulative effects arising from climate change, worsening air quality, freshwater shortages, deforestation, noise and light pollution, and wildlife habitat fragmentation.

Cumulative effects are typically the result of incremental changes to the environment caused by multiple human activities and natural processes. For example, wildlife habitat fragmentation has many possible causes such as road building, clearing native vegetation for land development, and water diversion projects. However, cumulative effects can also result from repetitive actions such as cyclical or episodic discharges of liquid waste or sewage into a water body or many wells tapping and depleting an aquifer. There are many different types of cumulative effects including additive, interactive, and synergistic, and they manifest in different ways whereby the ability of the environment to absorb or adapt to the effect is ultimately exceeded. Ideally, CEA leads to decisions that maintain environmental resiliency.

The purpose of a CEA process is to identify the relative contribution of a proposed activity to the total stresses on the affected environment and to determine whether that environment will be able to sustain the additional stress. To accomplish this, CEA methodology typically involves scoping, baseline studies and analysis of change trends, mitigation, significance determination and adaptive follow-up including monitoring.

There are no operational WEFs in the area. The Ncora WEF was proposed by the same developer and was authorised in 2011. This EA has since lapsed/expired, and the site area has been merged into the Ngxwabangu site. It is therefore not assessed separately. Individual impacts, where relevant, are however assessed from a cumulative perspective.

The cumulative impact of the proposed WEF, considering that no operational WEFs are present within 30km of the site is LOW. The Ngxwabangu WEF is situated within REDZ4.

9.1.2 No-go Alternative Impact Approach

It is mandatory to consider the "no-go" option in the BA Process. The "no-go" alternative refers to the current status quo and the risks and impacts associated with it. Some existing activities may carry risks and may be undesirable (e.g. an existing contaminated site earmarked for a development). The no-go is the continuation of the existing land use, i.e. maintain the status quo.

The status quo for the proposed WEF site would include the following:

IMMEDIATE AREA OF THE PROPOSED WEF:

- Small-scale livestock grazing (proposed WEF would have a negligible impact);
- Alien vegetation (proposed WEF would have a positive impact);
- Small-scale mining (proposed WEF would not have an impact); and
- Ecological processes (proposed WEF would have a negative impact).

ADJACENT AREA OF THE PROPOSED WEF:

- Tourism (proposed WEF would have a positive and a negative impact);
- Job creation (proposed WEF would have a positive and a negative impact); and
- Electricity stabilization (proposed WEF would have a positive impact).

9.2 General Impacts

Table 9-4 contains the general impacts associated with the proposed Ngxwabangu WEF. This table includes direct/indirect impacts, cumulative impacts and no-go alternatives for each impact identified. This table includes the issues, impacts, nature, pre-mitigation significance and post-mitigation significance. The full assessment of each impact as per Tables 9-4 and 9-5 above can be found in Appendix C of this Report. These tables contain full mitigation measures and include duration, extent, consequence, probability, reversibility of each impact. For the summary related to Specialist Impacts, please see Section 9.3.

Table 9-4: General Impacts Identified and Assessed. Full Impacts Tables can be found in Appendix C of this Report.

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
PLANNING & DESIGN PHASE					
GENERAL IMPACTS					
TRAFFIC & TRANSPORT	Inadequate planning for the transportation of turbine parts and specialist construction equipment to the site by long and/or slow-moving vehicles could cause traffic congestion, especially if temporary road closures are required. *Cumulative impact would be high should the moving of solar parts for Ncora PV Facility take place at the same time as the turbine components, but this EA has expired and this is therefore unlikely.* *No-go alternative would result in no impact related to transport of turbine parts.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **LOW -** **NO IMPACT**	▲ *Project planning must include a plan for traffic control that will be implemented, especially during the construction phase of the development. Consultation with the local Road Traffic Unit in this regard must be done early in the planning phase. The necessary road traffic permits must be obtained for transporting parts, containers, materials and construction equipment to the site.*	**LOW -** **LOW -** **NO IMPACT**
	The integrity of existing highway infrastructure such as bridges and barriers may be compromised by the heavy vehicle traffic delivering components to the site. *Cumulative impact would be high should the moving of solar parts for Ncora PV Facility take place at the same time as the turbine components, but this EA has expired, and this is therefore unlikely.* *No-go alternative would result in no impact related to transport of turbine parts.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**	▲ *Careful planning of the routes taken by heavy vehicles must highlight areas of road that may need to be upgraded in order to accommodate these vehicles. Once identified, these areas must be upgraded if necessary.*	**LOW -** **LOW -** **NO IMPACT**
STORAGE OF HAZARDOUS SUBSTANCES	Inappropriate planning for the storage of hazardous substances such as diesel, paint, pesticides, etc, tools and equipment used on site could lead to surface and ground water pollution e.g. due to oil leaks, spillage of diesel etc. In addition, these hazardous substances could be washed off into nearby drainage lines. The mixing of cement on site could result in ground water contamination from compounds in the cement. In addition, a large number of cement mixing stations on site could increase the presence of impermeable areas which in turn could increase rates of run-off and thereby	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **NO IMPACT** **NO IMPACT**	▲ *All hazardous substances such as paints, diesel and cement must be stored in a bunded area with an impermeable surface beneath them.* ▲ *Cement mixing must be conducted at a single location which must be centrally located, where practical. This mixing must take place on an impermeable surface, and dried waste cement must be disposed of with building rubble.*	**LOW -** **NO IMPACT** **NO IMPACT**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	increase the risk of localized flooding, soil erosion, silting, gully formation, etc. The proposed BESS will not trigger this activity as it will be assembled off-site. *Cumulative impact would be null as no other new activities, which include the use of hazardous substances are planned for this site (localised impact).* *No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.*				
ENVIRONMENTAL LEGAL AND POLICY COMPLIANCE	Failure to adhere to existing policies and legal obligations could lead to the project conflicting with local, provincial and national policies, guidelines and legislation. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment. *Cumulative impact would be high as there are a range of activities in the region which are already not compliant in terms of environmental policy and law.* *No-go alternative could result in landowners looking at other avenues of potential income which would need to comply with environmental law and policy.*	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **LOW -**	*Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy.* *These must include (but not restricted to):* ○ *Local and District Spatial Development Frameworks* ○ *Local Municipal bylaws* *In addition, planning for the construction and operation of the proposed energy facility must consider available best practice guidelines.*	**LOW -** **LOW -** **LOW -**
STORMWATER MANAGEMENT AND EROSION	The introduction of roads and impermeable areas could increase rates of run-off and therefore the risk of localised flooding. *Cumulative impact would be moderate as there are a range of activities, including roads, which contribute to erosion at localised levels. However, these activities are not prevalent in the area.* *No-go alternative would still present a level of stormwater runoff and erosion due to current farming activities and existing impermeable surfaces.*	**INDIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **LOW -**	*Structures must be located at least 32m away from identified drainage lines.* *A Stormwater Management Plan must be designed and implemented to ensure maximum water seepage at the source of water flow.* *The plan must also include management mitigation measures for water pollution, wastewater management and the management of surface erosion e.g. by considering the applicability of contouring, etc.* *An Erosion Management Plan must be designed and implemented to ensure minimal impact.*	**LOW -** **LOW -** **LOW -**
		DIRECT	**HIGH -**		**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
MANAGEMENT OF GENERAL WASTE	Inappropriate planning for management and disposal of waste e.g. storage disposal could result in surface and ground water contamination. *Cumulative impact, on a localised scale, would be negligible.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	 **CUMULATIVE** **NO-GO**	 **LOW -** **NO IMPACT**	▲ *Develop and implement a Waste Management Plan for handling on site waste.* ▲ *Designate an appropriate area where waste can be stored before disposal.* ▲ *General Waste must be disposed of at a registered landfill site.*	 **LOW -** **NO IMPACT**
SCHEDULING OF CONSTRUCTION	Construction scheduling that does not take into account the seasonal requirements of the aquatic environment, e.g. allowing for unimpeded flood events, could lead to short-term (and potentially long-term) impacts such as excessive sediment mobilization, etc. *Cumulative impact would be high should the neighbouring proposed PV Facility have planned construction over the same period. However, the Ncora PV EA has expired (proposed by the same developer) and this is therefore not relevant. The cumulative impact is therefore rated as low.* *No-go alternative would result in no impact related to construction scheduling as no other construction, that we are aware of, is planned on site.*	**INDIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **LOW -**	▲ *Wherever possible, construction activities must be undertaken during the driest part of the year to minimize downstream sedimentation due to excavation, etc.* ▲ *When not possible, suitable stream diversions structures must be used to ensure that rivers/streams are not negatively impacted by construction activity.*	**LOW -** **LOW -**
CONSTRUCTION PHASE					
GENERAL IMPACTS					
NUISANCE DUST	Dust is likely to be a potential nuisance due to the construction activities. *Cumulative impact would be moderate should the neighbouring proposed PV Facility have planned construction over the same period. However, the Ncora PV EA has expired (proposed by the same developer) and this is therefore not relevant. The cumulative impact is therefore rated as low. Improper management of a neighbouring site would exacerbate the impact.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**	▲ *Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following:* ○ *Damping down of un-surfaced and un-vegetated areas;* ○ *Retention of vegetation where possible;* ○ *Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions*	**LOW -** **LOW -** **NO IMPACT**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	No-go alternative would result in no impact related to construction nuisance dust as no other construction, that we are aware of, is planned on site.			*to avoid drifting of sand and dust into neighbouring areas;* ○ *A speed limit of 40km/h must not be exceeded on dirt roads;* • *Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.*	
FIRE	Risk of runaway fires from construction activities related to having people on site, such as cooking, smoking or burning of vegetation might lead to the burning of surrounding vegetation. *Cumulative impact would be moderate should the neighbouring proposed PV Facility have planned construction over the same period. However, the Ncora PV EA has expired (proposed by the same developer) and this is therefore not relevant. Improper management of a neighbouring site would exacerbate the impact.* *No-go alternative would still retain a fire risk as fires are a natural occurrence.*	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **HIGH -**	• *There must be no burning of construction waste or debris onsite.* • *Cooking and burning of vegetation is not permitted on site.* • *Smoking on site must be confined to a designated area in the vicinity of the site office which must be equipped with the necessary fire extinguishers.* • *Develop and implement a Fire Management Plan.*	**MODERATE -** **MODERATE -** **MODERATE -**
STORMWATER MANAGEMENT	Sediment is likely to be created during construction. This could be washed off into the nearby drainage line e.g. during the excavation of foundations, the laying of access roads within the site, digging of cable runs and soil stripping and stockpiling to create foundations and temporary areas of hard-standing, such as the construction camp. *Cumulative impact would be moderate as there are a range of activities, including roads, which could contribute to erosion at localised levels. However, these activities are not prevalent in the area.* *No-go alternative would still present a level of stormwater runoff and erosion due to current farming activities and existing impermeable surfaces.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **LOW -**	• *The recommendations of the Stormwater Management Plan must be implemented to avoid soil erosion and siltation of drainage line.* • *The recommendations of the Erosion Management Plan must be implemented to reduce the risk of soil erosion.*	**LOW -** **LOW -** **LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
DEGRADATION OF DRAINAGE LINES FROM EARTHWORKS	Unplanned construction activities or earthworks that occur close to onsite drainage lines could cause adverse impacts such as soil erosion, siltation, and blockage of the drainage line. *Cumulative impact would be high as there are a range of activities, including roads, a which could contribute to the degradation of drainage lines at localised levels if not properly managed during construction.* *No-go alternative would have no impact as there are currently no earthworks activities on site that we are aware of.*	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **NO IMPACT**	▲ *There must be no earthworks, apart from roadworks inclusive of culverts, within 32m of the drainage lines to avoid contamination of water sources.*	**LOW -** **LOW -** **NO IMPACT**
MANAGEMENT OF GENERAL WASTE	Littering by construction workers could cause surface and ground water pollution. *Cumulative impact, on a localised scale, would be low.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	**INDIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **LOW -** **NO IMPACT**	▲ *A Waste Management Plan, incorporating recycling and waste minimisation, must be implemented. The Waste Management Plan must be explained to all employees as part of the environmental induction training.*	**LOW -** **LOW -** **NO IMPACT**
HAZARDOUS SUBSTANCES	Onsite maintenance of construction vehicles/machinery and equipment could result in oil, diesel and other hazardous chemicals contaminating surface and ground water. Surface and ground water pollution could arise from the spillage or leaking of diesel, lubricants and cement during construction activities. *Cumulative impact would be null as no other new activities, which include the use of hazardous substances are planned for this site (localised impact).* *No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **NO IMPACT** **NO IMPACT**	▲ *The storage of fuels and hazardous materials must be located away from sensitive water resources.* ▲ *All hazardous substances (e.g. diesel, oil drums, etc.) must be stored in a bunded area.* ▲ *The recommendations of the Stormwater Management Plan and the Waste Management Plan must be implemented during construction.*	**LOW -** **NO IMPACT** **NO IMPACT**
MANAGEMENT OF CONSTRUCTION WASTE	Waste from construction activities e.g. excess concrete and cement mixture, empty paint containers, oil containers, etc., could cause pollution of ground and surface water when they come into contact with run-off water.	**DIRECT** **CUMULATIVE**	**MODERATE -** **LOW -**	▲ *A Waste Management Plan for the project must be developed and implemented in the construction phase.*	**LOW -** **LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	Cumulative impact, on a localised scale, would be moderate should the neighbouring proposed PV Facility have planned construction over the same period. However, the Ncora PV EA has expired (proposed by the same developer) and this is therefore not relevant. The cumulative impact would therefore be low. *No-go alternative would result in no impact related to construction waste as the site does not currently have any construction activities taking place.*	**NO-GO**	**NO IMPACT**	• *All waste must be disposed of at an appropriately licensed landfill site.* • *All construction materials must be stored in a central and secure location with controlled access with an appropriate impermeable surface.* • *The recommendations of the Stormwater Management Plan must be implemented to mitigate the impacts of run-off water on pollution.*	**NO IMPACT**
WATER QUALITY	Wet concrete is highly alkaline. This could result in flash kills of macroinvertebrates and fish species in the vicinity. Soil erosion will decrease the quality of the aquatic habitat downstream of the construction activities by silting over exposed rocks and decreasing the clarity and oxygen saturation of the water. Soil erosion will decrease the quality of the aquatic habitat downstream of the construction activities by silting over exposed rocks and decreasing the clarity and oxygen saturation of the water. *Cumulative impact, on a localised scale, would be high should the neighbouring proposed PV Facility have planned construction over the same period. However, the Ncora PV EA has expired (proposed by the same developer) and this is therefore not relevant. The cumulative impact would therefore be low.* *No-go alternative would result in no impact related to concrete contamination of watercourses as the site does not currently have any construction activities taking place.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **LOW -** **NO IMPACT**	• *No concrete mixing will take place within 32m of any watercourse.* • *The concrete batching plant must be clearly demarcated, and no sprawl must be tolerated.*	**LOW -** **LOW -** **NO IMPACT**
INFILLING/ EXCAVATION IN A WATERCOURSE	Excavated material stockpiles may increase sediment loads in watercourses during rainfall events. Materials used for the infilling of watercourses in order to construct water crossings may not be compatible with the surrounding bed/banks, etc., which could change the characteristics of the watercourse.	**INDIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **NO IMPACT** **NO IMPACT**	• *Stockpiled excavated material must not be stored within 32m of a watercourse.* • *Stockpile areas must be suitably bunded to prevent waterborne erosion of exposed soils where there is a likelihood that the soils will be washed into a watercourse.*	**LOW -** **NO IMPACT** **NO IMPACT**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	Cumulative impact, on a localised scale, would be low should the neighbouring proposed PV Facility have planned construction over the same period. However, the Ncora PV EA has expired (proposed by the same developer) and this is therefore not relevant. *No-go alternative would result in no impact related to excavated stockpiles as the site does not currently have any construction activities taking place.*			• *Materials used for infilling must be suitably stabilized to ensure that scour and erosion of the existing bed/banks is exacerbated.*	
DISPOSAL OF SPOIL MATERIAL	Incorrect disposal of subsoil/spoil material could result in significant loss of a useful resource. *Cumulative impact, on a localised scale, should the neighbouring proposed PV Facility have planned construction over the same period. However, the Ncora PV EA has expired (proposed by the same developer) and this is therefore not relevant.* *No-go alternative would result in no impact related to disposal of spoil materials as the site does not currently have any construction activities taking place.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **LOW -** **NO IMPACT**	• *Subsoil cannot be disposed of onsite without the appropriate Waste License in terms of the NEMA: Waste Act.* • *Spoil could be used to rehabilitate open borrow pits or erosion features.* • *Disposal of spoil material to a registered landfill must be the last option.* • *No spoil stockpiles will be allowed to remain onsite once construction activities have ceased.*	**LOW -** **LOW -** **NO IMPACT**
OPERATIONAL PHASE					
GENERAL IMPACTS					
AIR QUALITY CLIMATE CHANGE	The electricity generated by the development will displace some of that produced by fossil fuel-based forms of electricity generation. The scheme, over its lifetime, will therefore avoid the production of a significant amount of CO_2, SO_2 and NO_2 that would otherwise be emitted to the atmosphere. *Cumulative impact, on a localised scale, would be high when combined with the fact that other renewable energy facilities are likely in the area as the proposed Ngxwabangu WEF is situated within a REDZ.* *No-go alternative would result in a low negative impact as local power would not be offset by additional renewable energy.*	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH +** **HIGH +** **LOW -**	• *Enhance this impact by promoting the use of renewable energy locally.*	**HIGH +** **HIGH +** **LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
ARCHITECTURE OF ANCILLARY INFRASTRUCTURE	Control buildings, toilet facilities and other ancillary infrastructure could cause negative visual intrusion if allowed to fall into disrepair and not maintained properly. *Cumulative impact, on a localised scale, would be low considering that there are no existing renewable energy projects in the area. The project is however, situated within a REDZ and future developments are therefore possible.* *No-go alternative would result in no impact related to architecture of ancillary infrastructure.*	**DIRECT**	**MODERATE -**	▲ *All project structures and buildings must be maintained.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		**NO IMPACT**
HAZARDOUS CHEMICAL STORAGE	Inappropriate storage of chemical, herbicides, diesel and other hazardous substances on site could result in soil and water contamination and pose a high accident danger risk. *Cumulative impact would be null as no other new activities, which include the use of hazardous substances are planned for this site (localised impact).* *No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.*	**DIRECT**	**HIGH -**	▲ *All hazardous substances must be stored in appropriately bunded locations, where appropriate in terms of H&S regulations.*	**MODERATE -**
		CUMULATIVE	**NO IMPACT**		**NO IMPACT**
		NO-GO	**NO IMPACT**		**NO IMPACT**
INCREASED STORMWATER RUN-OFF	Failure to maintain the stormwater system could increase the risk of surface water damage to the landscape and vegetation from increased rates of run-off and therefore the risk of localised flooding and increased sheet erosion downstream due to the presence of roads and impermeable areas of hard standing. *Cumulative impact would be moderate as there are a range of activities, including roads, which could contribute to erosion at localised levels. However, these activities are not prevalent in the area so the impact has been rated as low.* *No-go alternative would still present a level of stormwater runoff and erosion due to current farming activities and existing impermeable surfaces.*	**DIRECT**	**MODERATE -**	▲ *Recommendations of the Stormwater Management Plan and Erosion Management Plan must be implemented.*	**LOW -**
		CUMULATIVE	**LOW -**		**LOW -**
		NO-GO	**LOW -**		**LOW -**
		DIRECT	**MODERATE -**		**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
WASTE MANAGEMENT	There could be littering by maintenance workers and security personnel on site. *Cumulative impact, on a localised scale, would be negligible.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	**CUMULATIVE** **NO-GO**	**LOW -** **NO IMPACT**	*A Waste Management Plan, incorporating recycling and waste minimisation, must be implemented. The Waste Management Plan must be implemented throughout the operational phase.*	**LOW -** **NO IMPACT**
DECOMMISSIONING PHASE					
GENERAL IMPACTS					
POLLUTION	Littering by construction workers could cause surface and ground water pollution. *Cumulative impact, on a localised scale, would be negligible.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **LOW -** **NO IMPACT**	*Littering must be avoided, and litter bins must be made available at various strategic points on site.* *Refuse from the decommissioning of the site must be collected on a regular basis and deposited at an appropriate landfill.*	**LOW -** **LOW -** **NO IMPACT**
	Onsite maintenance of construction vehicles/machinery and equipment could result in oil, diesel and other hazardous chemicals contaminating surface and ground water. Surface and ground water pollution could arise from the spillage or leaking of diesel, lubricants, etc. during decommissioning. *Cumulative impact would be null as no other new activities, which include the use of hazardous substances are planned for this site (localised impact).* *No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **NO IMPACT** **NO IMPACT**	*No storage of fuels and hazardous materials must be permitted near sensitive water resources. All hazardous substances (e.g. diesel, oil drums, etc.) to be stored in a bunded area.*	**LOW -** **NO IMPACT** **NO IMPACT**
DUST	Dust is likely to be a potential nuisance due to the decommissioning activities. *Cumulative impact would be low should neighbouring WEFs/PV facilities within the REDZ start decommissioning at the same time as the proposed Ngxwabangu WEF. However, this is unlikely based on the national screening tool results.*	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**	*Management of fugitive/nuisance dust could be implemented through the following:* ▪ *Damping down of un-surfaced and un-vegetated areas;* ▪ *Retention of vegetation where possible; Demolitions and other clearing activities must only be done during agreed working times and*	**LOW -** **LOW -** **NO IMPACT**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	No-go alternative would result in no impact related to decommissioning nuisance dust as no other decommissioning activities should be taking place on the site, that we are aware of.			*permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;* ▪ *A speed limit of 40km/h must not be exceeded on dirt roads.* • *Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.*	
TRAFFIC & TRANSPORT	A high number of heavy vehicle movements will occur during the decommissioning phase. This may have a detrimental effect on sensitive receptors. *Cumulative impact would be moderate should neighbouring WEFs/PV facilities within the REDZ start decommissioning at the same time as the proposed Ngxwabangu WEF. However, this is unlikely based on the national screening tool results and has therefore been rated as low.* *No-go alternative would result in no impact related to traffic and transport as no other decommissioning activities should be taking place on the site, that we are aware of.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **LOW -** **NO IMPACT**	• *Construction vehicles and machinery must make use of existing infrastructure such as roads as far as possible to minimise disturbance on the receiving environment.*	**LOW -** **LOW -** **NO IMPACT**
SOIL EROSION	After the removal of all wind turbine related structures, the disturbed soils could become exposed, unstable and prone to erosion. *Cumulative impact would be moderate should neighbouring WEFs/PV facilities within the REDZ start decommissioning at the same time as the proposed Ngxwabangu WEF. However, this is unlikely based on the national screening tool results and has therefore been rated as low.* *No-go alternative would result in no impact related to soil erosion as a result of turbine removal as no other WEFs are planned on this site.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **LOW -** **NO IMPACT**	• *After the removal of all wind turbine-related structures, the disturbed soils must be re-vegetated to avoid unnecessary soil erosion. This must be based on the Revegetation Plan and the Erosion Management Plan.*	**LOW -** **LOW -** **NO IMPACT**
LAND-USE	Land previously unavailable for certain types of land use will now be available for those uses.	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW +** **LOW +** **NO IMPACT**	• *No mitigation necessary*	**LOW +** **LOW +** **NO IMPACT**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	Cumulative impact would be low+ should neighbouring WEFs/PV facilities within the REDZ start decommissioning at the same time as the proposed Ngxwabangu WEF. However, this is unlikely based on the national screening tool results. *No-go alternative would result in no impact as the site will return to what it was used for before, i.e. the current status quo.*				

9.3 SPECIALIST IMPACTS

Table 9-5 contains the specialist impacts associated with the proposed Ngxwabangu WEF. This table includes direct/indirect impacts, cumulative impacts and no-go alternatives for each impact identified. This table includes the issues, impacts, nature, pre-mitigation significance and post-mitigation significance. The full assessment of each impact as per Table 9-4 above can be found in Appendix C of this Report and in each individual Specialist Report, Appendix D. These tables contain full mitigation measures and include duration, extent, consequence, probability, reversibility of each impact. For the summary related to General Impacts, please see Section 9.2.

Table 9-5: Specialist Impacts Identified and Assessed. Full Impacts Tables can be found in Appendix C of this Report. Specialist Reports can be found in Appendix D of this Report

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
PLANNING & DESIGN PHASE					
It is important to note that specialist planning and design phase impacts were not expected since the developer designed the layout presented in the BAR on sensitivity data and constraints provided by the various specialists. The planning and design impacts were therefore mitigated at Planning Phase.					
AQUATIC IMPACT ASSESSMENT					
None identified by specialist					
AVIFAUNAL IMPACT ASSESSMENT					
None identified by specialist					
BAT IMPACT ASSESSMENT					
None identified by specialist					
ECOLOGICAL IMPACT ASSESSMENT					
None identified by specialist					
HERITAGE IMPACT ASSESSMENT					
None identified by specialist					
NOISE IMPACT ASSESSMENT					
None identified by specialist					
PALAENTOLOGICAL IMPACT ASSESSMENT					
None identified by specialist					
SOCIAL IMPACT ASSESSMENT					
None identified by specialist					
TRAFFIC IMPACT ASSESSMENT					
None identified by specialist					
VISUAL IMPACT ASSESSMENT					
None identified by specialist					
CONSTRUCTION PHASE					
AQUATIC IMPACT ASSESSMENT					

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
DISTURBANCE AND LOSS OF AQUATIC HABITAT	Activities resulting in physical disturbance of wetland or riparian areas which provide ecosystem services, especially where new crossings are made or large hard engineered surfaces are placed within the buffer zones. Loss can also include a functional loss, through change in vegetation type via alien encroachment, reducing aquatic biodiversity. *Cumulative impact would remaining be high should the other WEFs be present in the area. However, only the Ncora PV Facility (same developer is present) and the EA has expired and is therefore not relevant.* *No-go alternative would result in no impact related to disturbance of aquatic habitats.*	**DIRECT**	**MODERATE -**	*Mitigation measures to reduce residual risk or enhance opportunities:* • *The final design must avoid the indicated No-Go areas, especially the grid towers / poles regardless of the option used, i.e. all options intersect with wetlands at some point.* • *A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to micro-siting of the final layout.* • *Where large cut and fill areas are required these must be stabilised and rehabilitated during the construction process, to minimise erosion and sedimentation.* • *Suitable stormwater management systems must be installed along roads and other areas and monitored during the first few months of use. Any erosion / sedimentation must be resolved through whatever additional interventions maybe necessary (i.e., extension, energy dissipaters, spreaders, etc).* *To minimise the impact of the access roads:* • *Use existing roads or upgrade existing tracks to cross wetlands rather than constructing entirely new roads wherever possible.*	**LOW -**
		CUMULATIVE	**NO IMPACT**		**NO IMPACT**
		NO-GO	**NO IMPACT**		**NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
				• *Use the smallest possible working corridor. Outside the working corridor, all watercourses are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. Where intrusion is required, the working corridor must be kept to a minimum and demarcated clearly, before any construction commences.* • *Removal of vegetation must only be when essential for the continuation of the project. Do not allow any disturbance to the adjoining natural vegetation cover or soils.* • *All pipe culverts must be removed and replaced with suitable sized box culverts, where road levels are raised. Crossings that are installed below the natural ground level are to be constructed with an appropriate drop inlet structure on the upstream side to ensure that headcut erosion does not develop as a result of the gradient change from the natural ground level to the invert level of the culvert.* • *The channel profile, regardless of the current state of the river / water course, will be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a pre-construction walkdown.* • *Water diversions must be temporary in*	

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				nature and no permanent walls, berms or dams may be installed within a watercourse. Sandbags used in any diversion or for any other activity within a watercourse must be in a good condition, so that they do not burst and empty sediment into the watercourse. Upon completion of the construction at the site, the diversions shall be removed to restore natural flow patterns. Under no circumstance shall a new channel or drainage canals be excavated to divert water away from construction activities. • *Any fauna (frogs, snakes, etc.) that are found within the construction area must be moved to the closest point of similar habitat type outside of the areas to be impacted.* • *All disturbed areas beyond the construction site that are intentionally or accidentally disturbed during the construction phase must be rehabilitated.* • *It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas.*	

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IMPACT ON RIPARIAN AND WETLAND SYSTEMS THROUGH THE POSSIBLE INCREASE IN SURFACE WATER RUNOFF ON FORM AND FUNCTION DURING THE CONSTRUCTION AND INTO THE OPERATIONAL PHASE, I.E. CHANGES TO THE HYDROLOGICAL REGIME	Increase in hard surface areas, and roads that require stormwater management will increase through the concentration of surface water flows that could result in localised changes to flows (volume) that would result in form and function changes within aquatic systems. Additionally, crossings that concentrate flows in valley bottom wetlands can lead to further erosion and sedimentation of downstream areas. These impacts can result in deterioration in freshwater ecosystem integrity, and a reduction in the supply of ecosystem services. *Cumulative impact would remaining be high should the other WEFs be present in the area. However, only the Ncora PV Facility (same developer is present) and the EA has expired and is therefore not relevant.* *No-go alternative would result in no impact related to disturbance of aquatic habitats.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **NO IMPACT** **NO IMPACT**	▲ *The buffer area must be considered as a No Go area for development and large infrastructure.* ▲ *A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems.* ▲ *The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area.* ▲ *The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion.* ▲ *Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil. Contingency plans must be in place for high rainfall events which may occur during construction.* ▲ *Monitoring of the project activities is essential to ensure the mitigation measures are implemented. Compliance with the mitigation recommendations must be audited by a suitably qualified independent Environmental Control Officer with an appropriately timed*	**LOW -** **NO IMPACT** **NO IMPACT**

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				audit report.	
CHANGES TO HYDROLOGICAL REGIMES THAT COULD ALSO LEAD TO SEDIMENTATION AND EROSION, THAT COULD ALSO OCCUR IN THE OPERATIONAL PHASE	Concentrated stormwater flow paths causing gully and rill erosion on the hillslope, and altered flow patterns causing erosion within the wetlands and rivers. The disturbed soils carried by unmanaged surface runoff then result in sedimentation of aquatic habitat down slope. These impacts can result in the deterioration of aquatic ecosystem integrity and a reduction/loss of habitat for flora & fauna. *Cumulative impact would remaining be high should the other WEFs be present in the area. However, only the Ncora PV Facility (same developer is present) and the EA has expired and is therefore not relevant.* *No-go alternative would result in no impact related to disturbance of aquatic habitats.*	**DIRECT**	**MODERATE -**	• *A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems. The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area. The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion. Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil.* • *Sedimentation must be minimised with appropriate measures. Any construction, within or directly upslope of a watercourse, causing bare slopes and surfaces to be exposed to the elements must include measures to protect against erosion using rows of silt fences, sandbags, hay bales and/or earthen berms spaced along contours at regular intervals. Construction must have contingency plans for high rainfall events during construction.* • *Energy dissipaters should be installed to*	**LOW -**
		CUMULATIVE	**NO IMPACT**		**NO IMPACT**
		NO-GO	**NO IMPACT**		**NO IMPACT**

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				prevent scour at any culvert outlet. This can be constructed of appropriately sized rock armour. Coarse bedding material or geotextile wrapped dump rock must be considered for use wherever the roads crosses wetland characterized by diffuse subsurface flows such as the seeps. • *Stormwater infrastructure must be inspected at least once every year (before the onset of rains) to ensure that it is working efficiently. Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters.*	
POTENTIAL IMPACT ON LOCALISED SURFACE WATER QUALITY	During construction or decommissioning, earthworks will expose and mobilise earth materials, and a number of materials as well as chemicals will be imported and used on site and may end up in the surface water, including soaps, oils, grease and fuels, human wastes, cementitious wastes, paints and solvents, etc. Any spills during transport or while works area conducted in proximity to a watercourse has the potential to affect the surrounding biota. This can result in possible deterioration in aquatic ecosystem integrity and species diversity. *Cumulative impact would remaining be high should the other WEFs be present in the area. However, only the Ncora PV Facility (same developer is present) and the EA has expired and is therefore not relevant.* *No-go alternative would result in no impact related to disturbance of aquatic habitats.*	**INDIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **NO IMPACT** **NO IMPACT**	• *All liquid chemicals including fuels and oil, including for the BESS, must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. Such facilities must be inspected routinely and must have the suitable PPE and spill kits needed to contain likely worst-case scenario leak or spill in that facility, safely.* • *Washing and cleaning of equipment must be done in designated wash bays, where rinse water is contained in evaporation/sedimentation ponds (to capture oils, grease cement and sediment).*	**LOW -** **NO IMPACT** **NO IMPACT**

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				▲ *Mechanical plant and bowsers must not be refuelled or serviced within 100m of a river channel.* ▲ *All construction camps, lay down areas, wash bays, batching plants or areas and any stores should be more than 50 m from any demarcated water courses.* ▲ *Littering and contamination associated with construction activity must be avoided through effective construction camp management.* ▲ *No stockpiling should take place within or near a water course.* ▲ *All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable.* ▲ *ESO monitors the site on a daily basis to ensure plant is in working order (minimise leaks), spills are prevented and if they do occur, are quickly rectified*	
CUMULATIVE IMPACTS ON THE AQUATIC RESOURCES OF THE AREA	The rating below is based on the premised that important or sensitive features will be avoided by the various projects, while the mitigations proposed will ensure that the form and or function of downstream areas remain intact. *Cumulative impact would remaining be high should the other WEFs be present in the area. However, only the Ncora PV Facility (same developer is present) and the EA has expired and is therefore not relevant.* *No-go alternative would result in no impact related to disturbance of aquatic habitats.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **NO IMPACT** **NO IMPACT**	▲ *The formalisation of existing road crossings, with properly sized culverts with erosion protection measures, can improve the condition of wetlands of the area. Lastly, the adoption, rehabilitation and maintenance of buffers around watercourses in the area, especially the valley bottom systems, would result in a net benefit to aquatic biodiversity.*	**LOW -** **NO IMPACT** **NO IMPACT**
AVIFAUNAL IMPACT ASSESSMENT					
DESTRUCTION OF BIRD HABITAT	Expressed as a proportion of the overall site area, the area of natural vegetation to be transformed for the wind farm is relatively	**DIRECT**	**MODERATE -**	▲ *The No-Go areas identified by this study (which build on those identified in the*	**MODERATE -**

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	small. Most of this vegetation is grassland in a fairly untransformed state, although it has been heavily grazed. The significance of this habitat destruction will be MODERATELY NEGATIVE. Since this habitat destruction is large unavoidable, we anticipate that the impact significance will remain unchanged by mitigation. The impact has the most significant consequences for small grassland specialist bird species such as Rudd's Lark and Yellow-breasted Pipit. As described in Section 9.2 of the Avifaunal Impact Assessment, the portions of site identified as holding populations of these species were designed out of the project earlier on. *Cumulative impact would remaining be high should the other WEFs be present in the area. However, only the Ncora PV Facility (same developer is present) and the EA has expired and is therefore not relevant.* *No-go alternative would result in no impact related to disturbance of avifaunal habitats.*	**CUMULATIVE** **NO-GO**	**MODERATE -** **NO IMPACT**	*pre-construction bird monitoring) should be adhered to.* • *If more than five years elapses between this study and construction, there may be a need to conduct further monitoring on site to determine whether any significant avifaunal features have changed in the interim.* • *A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the Basic Assessment (BA) Process and the construction phase. This should be done as part of the EMPr and final layout approval, preferably between October and March.* • *All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.* • *A Biodiversity Management Plan (BMP) must be designed by an ornithologist for the site prior to the Commercial Operation Date (COD). This BMP should include a bird fatality threshold and adaptive management policy, which identifies the number of bird fatalities of priority species which will trigger a management response, appropriate responses, and timelines for such*	**MODERATE -** **NO IMPACT**
DISTURBANCE OF BIRDS	Effects of disturbance on birds are particularly likely during breeding and could typically include loss of breeding productivity; temporary or permanent abandonment of breeding; or even abandonment of nest site. There are no sensitive large bird species breeding close enough to site to be of concern. Smaller species are likely to breed on site, and the two most important of these species have been afforded spatial protection for their prime habitat areas. We judge the significance of this impact to be MODERATE NEGATIVE pre mitigation and LOW NEGATIVE post mitigation. *Cumulative impact would remaining be high should the other WEFs be present in the area. However, only the Ncora PV Facility (same developer is present) and the EA has expired and is therefore not relevant.* *No-go alternative would result in no impact related to disturbance of avifaunal habitats.*	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **LOW -**		**LOW -** **MODERATE -** **LOW -**

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				responses. Fatalities of priority bird species are usually rare events (but with very high consequence) and it is difficult to analyse trends or statistics related to these fatalities as they occur. It is therefore important to have a threshold policy in place proactively to assist adaptive management. The BMP should form an annexure of the operational EMPr for the facility. A Draft Biodiversity Offset Strategy has been developed as part of the BAR, please see Appendix E. • *One blade on each turbine must be painted subject to Civil Aviation Authority and turbine manufacturer regulations. Provision must be made by the developer for the resolution of any technical, warranty, supplier challenges that this may present. If this cannot be resolved, the developer will be responsible for substituting this with a suitable alternate mitigation measure in consultation with the ornithologist.* • *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off site. The facility will need to address other sources of mortality of priority species in a measurable way (according to best practice) so as to compensate for residual effects on the facility itself. An example of such off-site mitigation could be the retrofitting of insulation onto*	

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				existing Eskom power lines in the project vicinity which pose an electrocution risk to vultures. This is a measurable impact which is not currently mitigated adequately by Eskom due to the cost. The project could contribute to the cost of such mitigation. Note: in April-May 2023 it was decided between the EAP, ecological specialist and avifaunal specialist that the presence of CBA1 areas on site triggered the need for an offset. Since the main trigger for this is Cape Vulture, a Cape Vulture offset plan was developed and will be implemented. • *No internal medium voltage power lines (33kV) should be overhead. All such cables should be buried along road verges. Only the 132kV lines from the switching station to the existing Qolweni Substation should be above ground. One exception has been granted for a 33 kV Overhead Line from Ngxwabangu to Ncora, within the assessed 132 kV Overhead Line corridor. This line will be shielded by the taller 132kV line and will pose minimal collision risk.* • *For both collision and electrocution on power lines, the first and foremost approach to mitigation should be the selection of the shortest and most sensible possible length of new overhead power line to be constructed and the optimal route for this line.*	

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				▲ *To mitigate for collision of the relevant species, it is recommended that the conductors on the high bird collision risk sections of the line be fitted with the best available (at the time of construction) Eskom approved anti bird collision line marking device. This should preferably be a dynamic device, i.e. one that moves as it is believed that these are more effective in reducing collisions, especially for bustards (see Shaw 2013), which are one of the key species (Denham's Bustard) in this area. It is recommended that a durable device be used as this area is clearly prone to a lot of strong wind and dynamic devices may be susceptible to mechanical failure. It will be either EDFR or Eskom's responsibility to ensure that these line marking devices remain in working order for the full lifespan of the power line, as we cannot afford to have significant numbers of bird collisions on this new line. It is important that these devices are installed as soon as the conductors are strung, not only once the line is commissioned, as the conductors pose a collision risk as soon as they are strung. The devices should be installed alternating a light and a dark colour to provide contrast against dark and light backgrounds respectively. This will make the overhead cables more visible to birds*	

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				flying in the area. Note that 100% of the length of each span needs to be marked (i.e. right up to each tower/pylon) and not the middle 60% as some guidelines recommend. This is based on a finding by Shaw (2013) that collisions still occur close to the towers or pylons. It is also recommended that the stay wires on the met masts on site be installed with these devices as soon as possible. • *In the case of bird electrocution, the power line must be built on an Eskom approved bird-friendly pole structure which provides ample clearance between phases and phase-earth to allow large birds such as vultures to perch on them in safety. This typically means a phase-phase and phase-earth typical clearance of at least 1800mm, and a Bird Perch on top of any monopoles.*	
BAT IMPACT ASSESSMENT					
ROOST DISTURBANCE OR DESTRUCTION	During construction of infrastructure for the WEF, potential bat roosts (roosting bats and/or roost sites) in trees, buildings, scattered rocky outcrops, or elsewhere could be disturbed or destroyed (during possible tree felling, demolishment of old buildings, blasting) if overlooked and/or not adequately avoided. To reduce the intensity and duration of this Low significant impact, all High sensitive areas (especially indigenous tree clumps, and buildings and the 200 m buffers around these) must be avoided. If	**DIRECT**	**LOW -**	• *Minimize road impacts. Minimize the length and breadth of proposed roads, and thus minimize the clearing and disturbance of natural areas (including potential bat roosting habitat).* • *Avoid blasting within 2 km of a confirmed roost.* • *Minimize degradation of terrestrial*	**LOW -**

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	this, and other recommended mitigation measures are followed, the potential impact of roost destruction or disturbance could be reduced to Insignificant. *Cumulative impact would remaining be high should the other WEFs be present in the area. However, only the Ncora PV Facility (same developer is present) and the EA has expired and is therefore not relevant.* *No-go alternative would result in no impact related to disturbance of bat habitats.*	**CUMULATIVE**	**LOW -**	*habitat (potential bat foraging and roosting habitat). Implement and maintain effective invasive alien plant, stormwater, erosion, sediment, and dust control measures.* • *Minimize artificial lighting on site. Apart from compulsory civil aviation lighting, minimize artificial lighting - especially high-intensity, steady-burning, sodium vapour, quartz, halogen, and other bright lights at sub-stations, offices, and turbines. All non-aviation lights should be hooded downward and directed to minimise horizontal and skyward illumination. Where possible, solar-powered motion-sensitive lights should be used. This must be inline with relevant H&S Regulations.* • *Commence again with acoustic bat monitoring. A detector(s) should be installed on the meteorological mast just before construction commences, and monitoring should occur throughout construction, during the first and second years of operation, and again during the fifth year of operation, and every fifth year thereafter.*	**LOW -**
		NO-GO	**NO IMPACT**		**NO IMPACT**
DESTRUCTION, DEGRADATION, AND FRAGMENTATION OF AND DISPLACEMENT FROM FORAGING HABITAT	Construction of the WEF will cause destruction, degradation, and fragmentation of mostly natural grassland habitat, where aerial-foraging bat species especially are likely to forage. Without careful planning, there could during construction also be destruction or disturbance of drainage lines and wetland areas, which currently provide bats with essential drinking water, concentrated insect prey, and/or which may represent important beacons or pathways for bat navigation and commuting. Furthermore, during operation, certain bats may be displaced from suitable foraging areas if they avoid the WEF (e.g. due to light pollution or obstruction to movement) or suffer fatality from collision with turbines. Considering that eight and 16 turbines impinge, respectively, on High and Medium-High sensitive areas, this impact was rated with High significance in the absence of mitigation. To reduce the significance of this impact to Medium, all High sensitive areas (especially perennial streams, and wetlands, and their 200 m buffers) must be avoided, the disturbance of Medium-High sensitive areas and the extent of the WEF road network should be minimized, undeveloped WEF-disturbed areas should be effectively rehabilitated post-construction, and light pollution should be minimized during all Project phases. *Cumulative impact would remaining be high should the other WEFs be present in the area. However, only the Ncora PV Facility (same*	**DIRECT**	**HIGH -**		**MODERATE -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		**NO IMPACT**
		NO-GO	**NO IMPACT**		**NO IMPACT**

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	developer is present) and the EA has expired and is therefore not relevant. *No-go alternative would result in no impact related to disturbance of bat habitats.*				
ECOLOGICAL IMPACT ASSESSMENT					
IMPACTS ON THE TERRESTRIAL HABITAT OF STRATEGIC WATER SOURCE AREA (SWSA)	Direct Impact The clearance of vegetation and associated construction activities within the northern portion of the Ngxwabangu Study Site will directly impact the terrestrial habitat of the Eastern Cape Drakensberg SWSA resulting in increased run-off, possible erosion, and loss of topsoil. This in turn could impact on the water quality entering the nearby rivers. This impacted is rated as moderate. However, if the mitigation measures specified below are implemented this impact can be reduced to low significance. Cumulative Impact Portions of the Eastern Cape Drakensberg SWSA have already been impacted by the clearance of vegetation for agriculture, gravel roads, villages and settlements, erosion due to overgrazing, amongst others. The construction of the Ngxwabangu WEF will therefore result in additional impacts on the terrestrial habitat of this SWSA. No-Go Alternative As above. Portions of the SWSA have already been impacted by the clearance of vegetation for agriculture, gravel roads, villages and settlements, erosion due to overgrazing, amongst others. However, under the no-go option, there will be no additional impact on the Eastern Cape Drakensberg SWSA as a result of construction of the Nxgwabangu WEF.	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **NO IMPACT**	• *An Erosion Management Plan / Method Statement should be compiled and implemented during the Construction Phase.* • *Sub-Escarpment Grasslands occur in important catchment areas; healthy wetlands are therefore essential for the continued provision of good quality water, so impacts on wetlands in these grasslands should be avoided. Therefore, the mitigation measures identified by the Aquatic Specialist should be implemented and adhered to.* • *Activities within 500m of a wetland and 100 m of a watercourse must obtain the necessary Water Use Authorisation prior to the commencement of construction activities.* • *Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion.* • *Disturbed areas must be rehabilitated as soon as possible after construction.* • *The site must be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion.*	**LOW -** **LOW -** **NO IMPACT**
LOSS OF DRAKENSBERG FOOTHILL MOIST	Direct Impact The clearing of land for the Construction of the proposed	**DIRECT** **CUMULATIVE**	**MODERATE -** **MODERATE -**	• *Vegetation clearance must be strictly limited to that which is necessary for the*	**LOW -** **LOW -**

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GRASSLAND (LC)	Ngxwabangu WEF will result in the direct loss of approximately 204 ha of Drakensberg Foothill Moist Grassland, an ecosystem classified as Least Concern in terms of the Red List of Ecosystems (SANBI, 2021). The current remaining extent of this vegetation type is 7661 km2. Therefore, the clearance of 204 ha of this vegetation type will represent a 0.03% loss of the current remaining extent. It should be noted that portions of this vegetation type has already been lost within the project area, particularly due to subsistence farming, livestock grazing, the expansion of settlements and villages, and the infestation of alien plant species. Cumulative Impact According to SANBI (2021), 70% of the historical extent of Drakensberg Foothill Moist Grassland currently remains. This indicates that 30% of this vegetation type has already been transformed (SANBI, 2021). Portions of this vegetation type has already been lost within the project area, particularly due to subsistence farming, livestock grazing, the expansion of settlements and villages, and the infestation of alien plant species. The construction of the proposed Ngxwabangu WEF will therefore contribute to the cumulative loss of Drakensberg Foothill Moist Grassland. No-Go Alternative If the project does not go ahead, the current impacts associated with grazing, subsistence farming, and the infestation of invasive alien species will continue. As such, the No-go Alternative is classified as low negative.	**NO-GO**	**NO IMPACT**	*construction of the proposed Ngxwabangu WEF. Blanket and strip clearing should be avoided where possible.* • *Maintain basal cover where possible and reduce/control soil erosion. These important management actions for restoring and maintaining healthy grasslands.* • *Where excavation is required, topsoil should be removed and managed for use during rehabilitation. Topsoil often contains a large seedbank which can aid in the restoration of impact areas.* • *Impacted areas that do not form part of the development footprint, and which are not required during the operational phase, must be rehabilitated as soon as possible after construction. Impacted areas should be spread with topsoil and planted species indigenous to the natural vegetation type of the project area.* • *Where possible, lay down areas should be located within previously disturbed areas. Laydown areas cannot be located within sensitive areas such as wetlands/ forest patches.*	**NO IMPACT**
LOSS OF TSOMO GRASSLAND (LC)	Direct Impact The clearing of land for the construction of the proposed Ngxwabangu WEF will result in the direct loss of approximately 11 ha of Tsomo Grassland, an ecosystem classified as Least Concern in terms of the Red List of Ecosystems (SANBI, 2021). The current	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **LOW -**	• *Employees must be prohibited from making open fires during the construction phase.* • *Existing roads must be utilised as far as practically and feasibly possible.*	**LOW -** **LOW -** **LOW -**

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	remaining extent of this vegetation type is 61374 km2. Therefore, the clearance of 11 ha of this vegetation type will represent a 0.002% loss of the current remaining extent. It should be noted that portions of this vegetation type has already been lost within the project area, particularly due to subsistence farming, livestock grazing, the expansion of settlements and villages, and the infestation of alien plant species. Cumulative Impact According to SANBI (2021), 61% of the historical extent of Tsomo Grassland currently remains. This indicates that 39% of this vegetation type has already been transformed (SANBI, 2021). Portions of this vegetation type has already been lost within the project area, particularly due to subsistence farming, livestock grazing, the expansion of settlements and villages, and the infestation of alien plant species. The construction of the proposed Ngxwabangu WEF will contribute to the cumulative loss of Tsomo Grassland. No-Go Alternative If the project does not go ahead, the current impacts associated with grazing, subsistence farming, and the infestation of invasive alien species will continue. As such, the No-go Alternative is classified as low negative.			• *An Alien Invasive Management Plan must be compiled and implemented during all phases of the proposed development.* • *The footprint of the proposed development must be micro-sited prior to construction. Should populations of threatened SCC be identified during micro-siting, the design and placement of the turbine hardstands and associated infrastructure components should be amended to avoid these populations. If this is not possible, permits for the removal and translocation of these populations must be obtained. Should translocation of threatened SCC be required, threatened SCC must be translocated to the same habitat type by a qualified botanist/ horticulturalist.* • *Do not use herbicides or hoeing in the creation of firebreaks.* • *A Fire Management Plan must be drafted by a suitably qualified specialist and implemented during the operation of the proposed Ngxwabangu WEF* • *Permits must be obtained for the removal/translocation of SCC protected in terms of the PNCO.*	
ENCROACHMENT OF CONSTRUCTION ACTIVITIES WITHIN THE SOUTHERN MISTBELT	Direct Impact All natural forests are protected in terms of the National Forests Act (NFA) of 1998. Although the development footprint provided by the Applicant does not entail development within the Southern	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **NO IMPACT**	• *All forest patches must be delineated and declared as no-go areas.* • *A 50 m no-go buffer must be established and delineated around all forest patches*	**LOW -** **LOW -** **NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
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FOREST PATCHES	Mistbelt Forest patches, these patches have been delineated and declared no-go areas as they provide important habitat for faunal species as well as threatened plant SCC such as Sensitive species 1248 (VU). Encroachment of construction activities within these forest patches would have a high negative impact as this would signify the loss of habitat/potential habitat for a range of threatened plant SCC and faunal species. A minimum of a 50 m no-go buffer has been recommended around forest patches to prevent potential encroachment. Should the recommendations and mitigation measures specified below be implemented during construction, the impact significance would be negligible. Cumulative Impact According to SANBI (2021), 83% of the historical extent of Southern Mistbelt Forest currently remains. This indicates that 17% of this vegetation type has already been transformed/ lost (SANBI, 2021). Encroachment of construction activities within the Southern Mistbelt Forest Patches would therefore contribute to the cumulative loss of this vegetation type. As this vegetation type provides important habitat for a range of faunal and floral species, the cumulative impact is classified as high. No-Go Alternative No loss/degradation of the Southern Mistbelt Forest patches within the project area was observed during the site survey. Under the no-go alternative, there would be no construction activities and therefore no impact on the Southern Mistbelt Forest patches within the project area. The significance of the no-go alternative is therefore classified as negligible. In the absence of the proposed development, it is likely that most of the large and small mammal species will probably still move around within and outside of the site due to movement towards foraging opportunities and/or moving away from anthropogenic			*within the project area.* • *No construction activities must be permitted within no-go areas.*	

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	activities and associated noises within the site.				
LOSS OF PLANT SPECIES OF CONSERVATION CONCERN	Direct Impact The clearance of vegetation could result in the loss of plant SCC (refer to Section 3.4.3), particularly species that are protected in terms of the Nature and Environmental Conservation Ordinance 19 of 1974, TOPS and List of Protected Trees. It is therefore recommended that the footprint of turbine hardstands, roads and other project related infrastructure is micro-sited prior to construction. Should any populations of threatened SCC be identified, the design and placement of project components should be amended to avoid these populations. If this is not possible, permits for the translocation of these SCC must be obtained. This impact is classified as high negative. However, if the recommended mitigation measures specified below are implemented, this impact can be reduced to low negative. Cumulative Impact SCC have likely already been lost as a result of the existing activities and developments in the broader area. As such, the loss of SCC associated with the proposed Ngxwabangu WEF will likely contribute to the cumulative loss of SCC within the region. However, if the mitigation measures as described in this report are implemented and adhered to, this impact can be reduced to low negative. No-Go Alternative The No-go alternative will not require the clearance of vegetation and will therefore not result in the loss of plant SCC. The no-go alternative is therefore negligible.	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **NO IMPACT**	• *The footprint of turbine hardstands, roads, and other project related infrastructure must be micro-sited prior to construction. Should populations of threatened SCC be identified during micro-siting, the design and placement of the project components should be amended to avoid these populations. If this is not possible, permits for the removal and translocation of these populations must be obtained. Should translocation of threatened SCC be required, threatened SCC must be translocated to the same habitat type by a qualified botanist/ horticulturalist.* • *Permits for the removal of plant species protected in terms of the Nature and Environmental Conservation Ordinance 19 of 1974, TOPS and List of Protected Trees must be obtained prior to vegetation clearance/translocation.* • *Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.*	**LOW -** **LOW -** **NO IMPACT**
LOSS OF CBA AND ESA	Direct Impact The construction of the proposed Ngxwabangu WEF will result in the loss of a portion of an area classified as a terrestrial CBA 1, CBA 2, ESA 1, and ESA 2 as well as an Aquatic ESA 1 and CBA 2. The	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **NO IMPACT**	• *Where possible, and inline with the ECBCP (2019), infrastructure should be placed outside of areas classified as CBA 1 and 2. The main reason for the*	**MODERATE -** **MODERATE -** **NO IMPACT**

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	classification of these areas was driven by the vegetation type, threat status, and the established national conservation target. Even though the site has been impacted by livestock grazing, alien plant species, subsistence agriculture and the expansion of villages, a systematic biodiversity planning algorithm will still select a site to ensure that the target is satisfied, recommending that degraded areas of CBAs are rehabilitated. Construction within these areas would therefore affect national conservation targets. Cumulative Impact Portions of CBAs and ESAs have already been lost within the region due to other developments and activities. The construction of the Ngxwabangu WEF will therefore contribute to the cumulative loss of areas classified as CBA 1, CBA 2, ESA 1 and ESA 2. No-Go Alternative The No-go alternative will not result in the loss of areas classified as CBA and ESA. However, it should be noted that the current impacts such as grazing and the infestation of alien plant species will continue. The no-go alternative is therefore negligible.			*classification of the CBA is the presence of vultures. As most of the development occurs within a CBA, an offset should be investigated for the area of influence lost due to the proposed development. The probability for success of the offset should be determined by a qualified avifaunal specialist, who should also be involved with the compilation of the required offset. This Biodiversity Offset Strategy has been drafted as a separate document and is available as Appendix E of the BAR.* • *The temporary laydown areas should be located within previously disturbed areas.* • *Existing roads must be utilised as far as practically and feasibly possible.* • *The footprint of turbine hardstands, roads, and other project related infrastructure must be micro-sited prior to construction. Should populations of threatened SCC be identified during micro-siting, the design and placement of the project components should be amended to avoid these populations. If this is not possible, permits for the removal and translocation of these populations must be obtained. Should translocation of threatened SCC be required, threatened SCC must be translocated within the same habitat type by a qualified*	

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				botanist/horticulturalist. • *Disturbed areas must be rehabilitated as soon as possible after construction. Only indigenous plant species must be used for rehabilitation.*	
HABITAT FRAGMENTATION AND DISRUPTION OF ECOSYSTEM PROCESSES	Direct Impact According to SANBI (2013), The ecological processes that maintain the 'health' of grassland ecosystems often operate at a large spatial scale. This means that large, contiguous and linked blocks of intact grassland habitat (i.e. corridors) are needed to allow ecological processes such as fire, grazing, dispersal and pollination to operate effectively. Development of the proposed WEF may isolated and fragment the habitat into small, isolated or disconnected patches which could lead to the breakdown of ecological processes (such as fire, grazing, dispersal and pollination). Of particular concern is the loss and altered fire regime. Fire is a major ecological driver within grassland ecosystems and the incorrect application, or the absence of burning, could result in a shift in species composition, infestation of alien invasive species, bush encroachment, an increase in densely-tufted or annual grass species, a decline in basal cover and an associated increase in soil erosion. Cumulative Impact Habitat fragmentation and the disruption of ecosystem process has already occurred within the broader area due to the construction of roads, houses, farming, amongst other land uses. Therefore, construction of the Ngxwabangu WEF is likely to result in the further fragmentation of habitats and the disruption of ecosystem function and process within the landscape. No-Go Alternative Habitat fragmentation and the disruption of ecological processes has already occurred within the broader area due to the	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **LOW -**	• *The clearance of vegetation must be strictly limited to that which is necessary for the construction of turbine hard stands, roads, and other project related infrastructure.* • *The temporary laydown areas should be located within previously disturbed areas.* • *Any impacted areas outside of the development footprint must be rehabilitated using indigenous plant species commonly occurring within the vegetation types of the project area.* • *Existing access roads should be utilised where feasible.* • *A Fire Management Plan must be drafted by a suitably qualified specialist and implemented during the operation of the proposed Ngxwabangu WEF.* • *Identify and maintain ecological corridors within the broader landscape to ensure the maintenance of ecosystem processes.*	**MODERATE -** **MODERATE -** **LOW -**

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	construction of roads, houses, farming, amongst other land uses. This will continue to occur though, at a very slow rate. Under the no-go alternative the impact is low negative.				
ESTABLISHMENT OF ALIEN PLANT SPECIES	Direct Impact The removal of existing natural vegetation creates 'open' habitats which favours the establishment of undesirable vegetation in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems. Alien invasive species already present on site such as *Acacia mearnsii* and Pinus sp., amongst others, can become quickly established and invasive. Cumulative Impact Scattered alien invasive species have already established in the surrounding area. Therefore, should the construction of the proposed Ngxwabangu WEF result in the further establishment of alien invasive species in the project area, the invasion by alien species could be exacerbated. The cumulative impact associated therewith has therefore been classified as moderate. No-Go Alternative There is already evidence of *Acacia me*arnsii and *Pinus sp*., amongst others, within the site. Under the no-go alternative these species are likely to continue multiplying if left unchecked. The current no-go alternative is thus rated as moderate negative.	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **LOW -** **MODERATE -**	⅄ *The site must be checked regularly for the presence of alien invasive species.* ⅄ *All alien invasive species that establish as a result of the project must be removed and disposed of as per the Working for Water Guidelines.* ⅄ *An Alien Invasive Management Plan must be compiled and implemented from the proposed Ngxwabangu WEF, BESS and Grid Connection.*	**LOW -** **LOW -** **LOW -**
DISTURBANCE AND/OR DEATH OF HERPETOFAUNA AND/OR LOSS OF HABITATS	Direct Impact (Preferred Alternative) During the construction phase, construction activities associated with the proposed development (e.g., vegetation clearance, excavation of soil, and the movement of construction vehicles) could result in wildlife mortalities through road kills or accidental killing, and/or cause the displacement of herpetofauna via increased noise or air pollution. Additionally, the loss of vegetation/soil due to clearance will result in the direct loss of faunal habitat, which will directly, and indirectly, impact on	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **MODERATE -**	⅄ *The relevant permits must be acquired for any removal of amphibians and reptiles within the study area that are listed as either Schedule I or II on the PNCO.* ⅄ *All construction staff must be educated with regards to wildlife conservation, and all staff employed by the developer must ensure that any amphibians or*	**LOW -** **LOW -** **LOW -**

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	amphibians and reptiles adapted to their ground dwelling habitats. Reptiles also face a high risk of being poached in the wild, and the increase in individuals associated with the construction of the proposed development could create reptile poaching opportunities. As such, this impact is rated moderate negative. Cumulative Impact The addition of the proposed development will likely exacerbate current impacts on amphibians and reptiles within the study area due to existing developments (e.g., roads, villages, sand mining, and livestock farming), and may exacerbate the loss of protected reptile species through increased poaching opportunities. Moreover, amphibians and reptiles are relatively poor dispersers and are slower to move away from construction areas, increasing their risk to impacts. Therefore, the cumulative impact is rated moderate negative. No-Go Alternative The No-go alternative will not require construction activities associated with the proposed development to take place and therefore will not result in any additional disturbance and/or death of amphibian or reptile species. If the proposed development is not approved, herpetofauna are likely to be disturbed and/or killed due to other activities taking place in the study area such as farming and forestry. The no-go alternative therefore is rated moderate negative.			*reptiles encountered during construction of the proposed development are not harmed or killed.* • *Amphibians and reptiles encountered must be allowed to move away from the construction area. In the event they need to be translocated, amphibians must be released in the same catchment areas while reptiles must be relocated to directly adjacent areas of the proposed development. No amphibian or reptile species may be removed off site without proper authorisation from the relevant authority.* • *A rescue plan must be developed to protect reptiles which could fall into construction pits.* • *The appointed ECO and ESO should be trained in snake handling and removal techniques.* • *Any amphibian or reptile species that may die due to construction activities associated with the proposed development must be recorded (e.g., photographed and GPS coordinates taken) and reported to the appointed ECO and relevant authorities (i.e., EWT). Where needed, the carcass should be donated to SANBI.* • *All individuals, including construction workers must sign a register prior to accessing the construction site.* • *Construction workers must not be*	

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				housed on site. • *Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads.* • *The construction of turbine handstands or project related infrastructure on rocky outcrops and/or permanent waterbodies must be avoided. Moreover, some amphibian species breed in temporary waterbodies, therefore it is recommended that where possible construction activities should take place outside of the wet and rainy season.* • *All reasonable and feasible measures should be implemented to reduce noise in ecologically sensitive areas.*	
DISTURBANCE AND/OR DEATH OF MAMMALS AND/OR LOSS OF HABITATS	Direct Impact (Preferred Alternative) During the construction phase, construction activities associated with the proposed development (e.g., vegetation clearance, excavation of soil and the movement of construction vehicles) could result in wildlife mortalities through road kills or accidental killing, and/or cause the displacement of mammals via increased noise or air pollution. Additionally, the loss of vegetation/soil due to clearance will result in the direct loss of faunal habitat, which will directly, and indirectly, impact on small sedentary species adapted to their ground dwelling habitats. Larger more agile species such as antelope are likely to disperse to more suitable habitats away from construction areas. As such, this impact is rated slight negative. Cumulative Impact	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **LOW -**	• *The relevant permits must be acquired for the removal of any mammals within the study area that are listed as either Schedule I or II on the PNCO.* • *All construction staff must be educated with regards to wildlife conservation, and all staff employed by the developer must ensure that any mammals encountered during construction of the proposed development are not harmed or killed.* • *Any mammals encountered must be allowed to move away from the construction area. No mammal may be*	**LOW -** **LOW -** **LOW -**

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	The addition of the proposed development may exacerbate current impacts on mammals within the study area due to existing developments (e.g., roads, villages, sand mining, and livestock farming), and could exacerbate the loss of protected mammal species through increased poaching opportunities. However, mammals are relatively agile and can move away from construction areas to more suitable habitat. Therefore, the cumulative impact is rated slight negative. No-Go Alternative The no-go alternative will not require construction activities associated with the proposed development to take place and therefore will not result in any additional disturbance and/or death to mammal species. If the proposed development is not approved, mammal species are likely to be disturbed and/or killed due to other activities taking place in the study area such as farming and forestry. The no-go alternative therefore is rated slight negative.			*removed off site without proper authorisation from the relevant authority.* • *Any mammal species that may die due to construction activities associated with the proposed development must be recorded (e.g., photographed and GPS coordinates taken) and reported to the appointed ECO and relevant authorities (i.e., EWT). Where needed, the carcass should be donated to SANBI.* • *Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads.* • *The construction of turbine handstands on rocky outcrops and/or permanent waterbodies must be avoided.* • *All reasonable and feasible measures should be implemented to reduce noise in ecologically sensitive areas*	
DISTURBANCE AND/OR LOSS OF HERPETOFAUNA SPECIES OF CONSERVATION CONCERN	Direct Impact (Preferred Alternative) During the construction phase, construction activities associated with the proposed development (e.g., vegetation clearance, excavation of soil and the movement of construction vehicles) could result in the loss of herpetofauna SCC through increased road kills or accidental killing, and/or cause the displacement of Coppery Grass Lizard. Neither have been recorded nor observed within study area, but both species are expected to have a high chance of occurrence within the study area (refer to Section 3.5.2). As such, this impact is rated as moderate negative.	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **LOW -**	• *A Search and Rescue Operation must be undertaken for protected amphibian and reptile species.* • *The relevant permit must be acquired for the removal of any amphibians and reptiles within the study area that are listed as ether Schedule I or II on the PNCO.* • *Not all areas can be avoided, but it is recommended that construction staff must be educated with regards to*	**LOW -** **LOW -** **LOW -**

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	Cumulative Impact Herpetofauna SCC likely have been disturbed and/or lost due to existing developments and activities within the study area, and the potential loss of herpetofauna SCC associated with the construction of the proposed development may contribute to the overall cumulative loss of SCC within the broader study area. As such, this impact is rated as moderate negative. No-Go Alternative The no-go alternative will not require the clearance of vegetation/soil and therefore will not result in the potential loss of herpetofauna SCC. If the proposed development is not approved, SCC are still likely to be disturbed and/or killed due to other activities taking place in the study area such as farming and forestry. The no-go alternative therefore is rated slight negative.			*wildlife conservation and that all staff employed by the developer ensure that any amphibians or reptiles encountered are not harmed or killed.* • *Amphibians or reptiles encountered must be allowed to move away from the construction area. In the event they need to be translocated, amphibians must be released in the same catchment area while reptiles must be relocated to directly adjacent areas of the proposed development. No amphibians or reptiles may be removed off site without proper authorisation from the relevant authority.* • *Where possible, amphibian or reptile SCC observed on site must be recorded (photographed, GPS coordinates taken) and loaded onto iNaturalist by the appointed ECO.* • *The construction of turbine handstands on permanent waterbodies must be avoided*	
DISTURBANCE AND/OR LOSS OF MAMMAL SPECIES OF CONSERVATION CONCERN	Direct Impact (Preferred Alternative) During the construction phase, construction activities associated with the proposed development (e.g., vegetation clearance, excavation of soil and the movement of construction vehicles) could result in the disturbance and/or loss of mammal SCC through increased road kills or accidental killing, and/or cause the displacement of mammal SCC via increased noise or air pollution. Several mammal SCC, including antelope, have been identified as possibly occurring within the study area (refer to Section 3.5.1). Additionally, some mammal SCC may face the risk of being hunted,	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **LOW -**	• *Mammal SCC encountered must be allowed to move away from the construction area. No mammal SCC may be removed from site without authorisation from the relevant authority.* • *The relevant permit must be acquired for the removal of any of the mammals within the study area that are listed as ether Schedule I or II on the PNCO.*	**LOW -** **LOW -** **LOW -**

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	baited, or trapped by construction staff. However, many of the mammal SCC identified in this report, if not all, are able to move away from construction areas to more suitable habitats. As such, this impact is rated as low negative. Cumulative Impact Mammal SCC have likely already been lost due to existing developments and activities within the study area (e.g., livestock farming and hunting). The potential loss of mammal SCC associated with construction of the proposed development may therefore contribute to the overall cumulative loss of SCC within the broader study area. As such, this impact is rated as low negative. No-Go Alternative The no-go alternative will not require the clearance of vegetation/soil and therefore will not result in the potential loss of mammal SCC. If the proposed development is not approved, mammal SCC are still likely to be disturbed and/or killed due to other activities taking place in the study area such as farming and hunting. The no-go alternative therefore is rated low negative.			▲ *Not all areas can be avoided, but it is recommended that construction staff must be educated with regards to wildlife conservation and that all staff employed by the developer ensure that any mammals encountered are not harmed or killed.* ▲ *The hunting, baiting, or trapping of mammals by construction staff must be strictly prohibited.* ▲ *The appointed ECO should inquire and undertake an overview inspection of the site for the evidence of snares during the construction phase.* ▲ *Where possible, mammal SCC observed on site must be recorded (photographed, GPS coordinates taken) and loaded onto iNaturalist by the appointed ECO.*	
HERITAGE IMPACT ASSESSMENT					
LOSS OF HERITAGE RESOURCES: ARCHAEOLOGY	The study identified an Iron Age site of heritage significance. The sites are situated in the vicinity WTG 25 and its associated access roads but impact on the sites seem unlikely. Mitigation measure will nonetheless apply.	**DIRECT**	**LOW -**	▲ *Fixed Mitigation Procedure (required): Site Monitoring: Regular examination of trenches and excavations.* ▲ *Monitor as frequently as practically possible. Preferred Mitigation Procedure: Avoidance: Implement a heritage conservation buffer of at least 100m around the heritage resource, redesign infrastructure to avoid the heritage resource and the proposed conservation buffer.* ▲ *Alterative Mitigation Procedure (if*	**LOW -**
		CUMULATIVE	**LOW -**		**LOW -**
		NO-GO	**LOW -**		**LOW -**
LOSS OF HERITAGE RESOURCES: BUILT ENVIRONMENT	The study noted the remains of the poorly preserved dwellings, buildings and enclosures dating to Historical Period settlement in the area but no notable heritage or historical association to the sites could be established and the sites are of medium-low heritage significance. Some of the features and sites occur around and within areas demarcated for development of WTG 36 and its associated access roads, associated access roads, the OHL Alternative 1 and OHL Alternative 2 as well as one of the proposed	**DIRECT**	**LOW -**		**LOW -**
		CUMULATIVE	**LOW -**		**LOW -**
		NO-GO	**LOW -**		**LOW -**

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	BESS sites and potential impact on the sites should be closely monitored to avoid the destruction of previously undetected heritage remains. As for the rest of the project area, the general landscape holds varied significance in terms of the built environment as the area comprises historical farming remnants and relatively newly established settlements and townlands.			*preferred mitigation procedure is not feasible): Documentation of sites if features are to be impacted on by development (mapping, desktop study Phase 2 site sampling). Permitting if and when required.*	
LOSS OF HERITAGE RESOURCES: CULTURAL LANDSCAPE	The larger area comprises a rich cultural horizon and the natural landscape surrounding the proposed project encompasses open grasslands and river valleys, typical of the rural areas of the Eastern Cape. The cultural landscape holds Herder sites, Iron Age remains, Colonial Period farmsteads and Historical towns. Of note is a ceremonial rock in the larger project area which has heritage significance. The feature will not be impacted on by the development. Further away from the project area, the landscape is typical of the Eastern Cape with large flat parcels with occasional undulating hills and mountainous regions.	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **LOW -**	• *Site Monitoring: Regular examination of trenches and excavations in order to detect and preserve previously undocumented heritage receptors.* • *Social Consultation: It is suggested that local communities be consulted with regards to the religious and social meaning of the site and possible impacts / management of the site.* • *Avoidance: Implement a heritage conservation buffer of at least 50m from all burials / graves. Where digging / construction encroaches on this buffer, erect a temporary construction barricade around burials to clearly indicate the location of burials. Implement a site management plan detailing strict site management conservation measures.* • *Grave Relocation: Relocation of burials and documentation of site, full social consultation with affected parties, possible conservation management and protection measures. Subject to authorisations and relevant permitting from heritage authorities and affected parties.*	**LOW -** **LOW -** **LOW -**
LOSS OF HERITAGE RESOURCES: HUMAN BURIAL SITES	A number of burial sites were located in the larger project area. These receptors are of high significance for their social and cultural value but no direct impact on the resources is anticipated. However, some of the burial site occurs in close proximity of areas demarcated for development of WTG 36 and its associated access roads and potential impact on the site should be monitored to avoid damage to the site and potential other undetected heritage remains. It should be noted that graves and cemeteries often occur within settlements or around homesteads in the rural areas of the Eastern Cape, and they are also randomly scattered around archaeological and historical settlements. The probability of informal human burials encountered during development should thus not be excluded. In addition, human remains and burials are commonly found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **LOW -**		**LOW -** **LOW -** **LOW -**

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	landscape as these burials, in most cases, are not marked at the surface. Human remains are usually observed when they are exposed through erosion. In some instances packed stones or rocks may indicate the presence of informal pre-colonial burials. If any human bones are found during the course of construction work then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial they would need to be exhumed under a permit from SAHRA (for pre-colonial burials as well as burials later than about AD 1500). Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity should cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met.				
NOISE IMPACT ASSESSMENT					
CONSTRUCTION NOISE: DAYTIME	Construction of the access roads during the day raising ambient sound levels in the area. Considering the ambient sound level measurements collected in the area, daytime sound levels could range between 22 and 76 dBA. Daytime construction activities should not change the existing ambient sound levels with more than 7 dB, nor should the construction activities result in noise levels exceeding the daytime noise limit (55 dBA) recommended by the WHO / IFC.	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**	*The significance of the noise impact is Low, and additional mitigation measures are not required. It is however recommended that the applicant plan that access roads are not constructed at night.*	**LOW -** **LOW -** **NO IMPACT**
CONSTRUCTION NOISE: NIGHTTIME	Various construction activities (likely limited to the pouring of concrete as well as erection of WTG components) taking place simultaneously at night will increase ambient sound levels due to air-borne noise. Considering the ambient sound level measurements collected in the area, daytime sound levels could range to less than 20 and 72 dBA.	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **NO IMPACT**	*Significance of night-time construction noises may be medium for the scenario as conceptualized and additional mitigation measures are required and recommended as follows:* ○ *Plan construction schedule that such simultaneous activities*	**LOW -** **LOW -** **NO IMPACT**

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	Night-time construction activities should not change the existing ambient sound levels with more than 7 dB, nor should the construction activities result in noise levels exceeding the night-time noise limit (45 dBA) recommended by the WHO / IFC.			*are only required at one WTG location (located within 1,000m from an NSR). Other simultaneous construction activities can continue, but should take place further than 1,000m from NSR; and* ○ *Minimise active equipment at night, planning the completion of noisiest activities (though unlikely, could include activities such a pile driving, rock breaking and excavation) during the daytime period.*	
PALAENTOLOGICAL IMPACT ASSESSMENT					
NO IMPACTS IDENTIFIED | SITE VERIFIED AS HAVING VERY LOW SENSITIVITY					
SOCIAL IMPACT ASSESSMENT					
TEMPORARY STIMULATION OF THE NATIONAL AND LOCAL ECONOMY	As indicated in Table 4.1 it is estimated that the project will increase the country's economic production (revenue generation) by R4.3 billion in 2021 prices, which will translate into an additional R1.6 billion of gross domestic product (GDP). These effects will take place over the course of the construction period which is estimated to last approximately two years. To put this investment into perspective, the total GDP impact over the two-year period is equivalent to approximately 64-65% of the IYLM's annual GVA output. The greatest effects on economic production and GDP stimulated during construction activities will be created through the multiplier effects, specifically through a combination of production and consumption induced effects. Production induced effects are those that result from an increase in the demand for goods and services from those businesses that are likely to provide inputs (i.e.,	**DIRECT** **CUMULATIVE** **NO-GO**	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**	⅄ *The wind energy facility developer, EDF Renewables, should prescribe that the EPC contractor prioritises local procurement of goods and services where possible from nearby sourcing hubs being Komani and Mthatha. This will be limited to more general construction related goods and services as well as generic machinery.* ⅄ *The EPC should also be encouraged to raise awareness amongst local businesses as well as aspiring entrepreneurs within the study area prior to the construction taking place. Awareness should extend to catering companies as well as accommodation*	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
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	cement, steel, etc.) to the construction company(ies) responsible for building the associated infrastructure. Consumption induced effects are those that arise from increased spending on goods and services by those individuals employed during the construction phase of the development. It is assumed that the majority of the direct spend will be spent within the primary and secondary study areas. It should be noted that actual final expenditure will depend on the choice of suppliers and contracts as well as their procurement strategies. Besides the value added that could be generated by local construction businesses through sub-contracting agreements and employment of free-lancers, the sectors that are expected to benefit the most from the production and consumption induced effects are tertiary services such as trade, accommodation, transport services, personal services, real estate, and insurance.			*businesses in the nearby towns and generic construction businesses as mentioned above.* • *Sub-contract to local construction and transport companies particularly MSME's, B-BBEE compliant and women-owned enterprises where possible.* • *Use local suppliers where feasible and arrange with the local MSME's to provide transport, catering and other services to the construction crews.*	
TEMPORARY INCREASE IN EMPLOYMENT IN THE STUDY AREA, REGIONAL AND NATIONAL ECONOMIES	The proposed wind energy facility and its related infrastructure are anticipated to directly create approximately 203 Full Time Equivalent (FTE) employment positions over the course of the construction phase (see Table 4.2). To put these employment numbers into perspective, the direct employment of the project, if all captured within the IYLM area would represent a growth of 27% in the local construction sector's current employment. Beyond the direct employment opportunities that will be created by the project during the construction phase the development will also have a positive spin-off effect on the employment situation in other sectors of the national and local economies. Through the procurement of local goods and services (i.e., consumption induced effects) the project will support an additional 1226 FTE employment positions during the construction phase. Based on these figures, the contribution of the proposed wind energy facility and its related infrastructure development towards	**DIRECT** **CUMULATIVE** **NO-GO**	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**	• *Co-ordinate and arrange local community meetings through the Instika Yethu local municipality, labour unions and local traditional councils to advise the local labour force about the proposed project and the jobs that can potentially be applied for.* • *Establish numerous local skills desks to determine the potential skills that could be sourced from the area. Skills desks could be located at the stone quarry and the Lubisi conference centre found in the Mcambalala traditional council as well as the local clinic found within the proposed study area as well as in nearby towns such as Cofimvaba and Komani.* • *Recruit local labour as far as feasible.* • *Provide the local labour force with*	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
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	employment creation in the broader South African economy is estimated to eventually amount to 4519 FTE employment positions over the two years of construction. Throughout the construction phase it is recommended that the developer encourages the contractor to fill as many local positions as possible using labour within the Instika Yethu local municipality and where possible from the four traditional council communities. In chapter three of the report, the socio-economic profile revealed the low education attainment levels amongst the population living in and around study area- this suggests that it is unlikely that there are going to be a significant number of people readily available to perform the necessary jobs right at the beginning of the construction phase. Even in terms of unskilled positions, locals without construction related experience will not be equipped with the requisite skills and know-how to complete required construction tasks. As such, lead time would need to be allocated to provide prospective local workers with the necessary on-the-job and on-site training prior to the construction of the wind energy facility.			*necessary training prior to the construction phase.* • *Employment of labour-intensive methods in construction where feasible.*	
CONTRIBUTION TO SKILLS DEVELOPMENT IN THE STUDY AREA AND REGIONAL ECONOMY	The construction phase of the wind energy facility and its related infrastructure is likely to have a positive impact on the skills development in the study area and regional economy. During the establishment phase, it is likely that specialist technical experts will be involved. This will present an opportunity for skills and knowledge transfer between these technical experts and local labour. It is also expected that the construction crew involved in the project will gain knowledge and experience in respect of the development of electrical infrastructure related to the wind energy industry. This will be highly beneficial given South Africa's target of generating 20 000MW of renewable energy by 2030 (Department	**DIRECT** **CUMULATIVE** **NO-GO**	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**	• *Facilitate knowledge and skills transfer between highly specialised technical experts and South African professionals during the pre-establishment and construction phases.* • *Provide basic construction training to recruited local members before the construction phase takes place.* • *Set up apprenticeship programmes to build onto existing skill levels or develop new skills amongst construction workers especially those from the local communities.*	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**

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	Energy, 2019). More skilled local construction crews would most likely also lower the cost of future renewable energy-related developments in the region. In general, one out of four construction workers are usually drawn from local communities, it is therefore highly probable that these workers will be able to utilise these new skills over the long run, in any future developments proposed within the eastern region of the province, specifically the Chris Hani District municipality. In addition to the direct effects of the project on skills development in the regional and the local economy, the project could contribute to the development of the local R&D and manufacturing industries associated directly and indirectly with the renewable wind energy industry. This could be achieved through partnerships with the Nelson Mandela University (NMU), Walter Sisulu University, Rhodes University and the University of Fort Hare. Partnerships of this nature could further enhance the development of new skills and expertise.			• *Improved labour productivity and employability of construction workers for similar projects proposed in the province.* • *Possible development of provincial skills and expertise in R&D and manufacturing, specialist services and construction industries related to the wind energy industry through partnerships with Nelson Mandela University, Rhodes University, Walter Sisulu University and the University of Fort Hare.*	
TEMPORARY INCREASE IN HOUSEHOLD EARNINGS	The proposed wind energy facility and its associated infrastructure development will through the construction phase, generate R739.7 million worth of revenue for the affected households in the country through direct, indirect and induced effects. Based on Table 4.3, R169.1 million will be paid out in the form of salaries and wages to those individuals directly employed during the two-year construction phase. The remaining value of R570.5 million in households' earnings will be generated through indirect and induced effects resulting from project expenditure. Although temporary, this increase in household earnings will have a positive effect on the standard of living within the households of the immediate study area as well as the regional area at large. This increase in household earnings however will vary significantly based on the respective skill levels and job specifications of the	**DIRECT** **CUMULATIVE** **NO-GO**	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**	• *Recruit local labour as far as feasible to increase the benefits to the local households.* • *Employ labour intensive methods in construction where feasible.* • *Sub-contract to generic local construction companies where possible.* • *Use local suppliers where feasible and arrange with local MSME's and B-BBEE compliant enterprises to provide transport, catering and other services to the construction crews.* • *Improved standard of living of provincial citizens around the Eastern Cape whose carrier now centre around the development, planning and construction*	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**

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	employee.			*of renewable energy projects.*	
TEMPORARY INCREASE IN GOVERNMENT REVENUE	During the construction phase of the Ngxwabangu wind energy facility, its related infrastructure will generate revenue for the government during the construction period through a combination of personal income tax, VAT, companies' tax, etc. Additional government revenue will also be earned through corporate income tax. Government earnings will be distributed by national government to cover public spending which includes amongst others the provision and maintenance of transport infrastructure, health and education services as well as other public goods.	**DIRECT** **CUMULATIVE** **NO-GO**	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**	*None suggested*	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**
TEMPORARY INCREASE IN SOCIAL DISRUPTIONS ASSOCIATED WITH THE INFLUX OF LABOUR AND JOB SEEKERS	Based on the overall socio-economic profile of the immediate study and the Instika Yethu local municipality as a whole, it is highly unlikely that the workforce required for the construction period will be drawn primarily from the specific study area and surrounding communities. Non-local professionals and more specialised labourers involved in the construction phase will therefore be traveling to the site on a daily basis from neighbouring towns where they would be temporarily residing. The influx of construction workers into the area could result in social disruptions between the local population and the existing construction workers currently operating in the area and this new workforce through perceptions by the local population of these migrant workers "stealing" their employment opportunities. Likewise, the influx of jobseekers and opportunists from other communities in the greater Chris Hani District, could potentially lead to a temporary increase in the level of petty crime, illicit activity, litter and possibly a deterioration of the health of the local community through the spread of communicable diseases (e.g., flu, TB). There is also the possibility that semi-skilled and unskilled construction workers could also choose to remain in the area following the completion of the construction phase and without any form of alternative income these individuals run the risk of	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**	*Set up a recruitment office in the nearby towns (such as Cofimvaba and Komani) and adhere to strict labour recruitment practices that would reduce the desire of potential job seekers to loiter around the area in the hope of finding temporary employment.* *Control the movement of workers between the site and areas of temporary residence to minimise loitering around the site. This should be achieved through the provision of scheduled transportation services between the construction site and area of residence.* *Involve the traditional leaders from the four administrative areas of the study area to inform the EPC contractor and the proposed development team at large about the cultural and religious land practices that are followed in the study area.* *The traditional leaders should be encouraged to assign a reliable person in*	**LOW -** **LOW -** **NO IMPACT**

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	exacerbating the level of poverty within the study area and the local municipality at large. With the study area being part of the former Transkei, this suggests that the traditional land may have a high cultural significance and value attached to it as well as the local community members practicing their respective cultural traditions which may be connected to the land. Therefore, construction workers and companies who would be migrating to the study area for the purpose of constructing the proposed energy wind facility, need to be informed by the traditional leaders and community representatives prior to the construction phase of any key landmarks and cultural rituals being practiced within in specific areas in and surrounding the study area. Addressing the challenges related to potential social impacts is best done in partnership with all stakeholders in the area, specifically the affected interested parties, the traditional council leaders and their community representatives, ward councillors and municipality employees. This would promote transparency in information sharing and help build good relationships between all affected parties.			*their respective administration area to deal with complaints of their community members.* • *Employ locals as far as feasible through the creation of a local skills database.* • *Establish a management forum comprising of key stakeholders to monitor and identify potential problems that may arise due to the influx of job seekers to the area.* • *Ensure that any damages or losses to nearby buildings that can be linked to the conduct of construction workers are adequately reimbursed.* • *Assign a dedicated person to deal with complaints and concerns of affected parties.*	
IMPACT ON ECONOMIC AND SOCIAL INFRASTRUCTURE	The wind energy facility and associated infrastructure are anticipated to directly create 203 FTE positions during the construction phase. This means that there will be a relatively large number of people who will be on site over the course of the project. It is estimated that a sizeable portion of these construction workers will be coming from outside the study area and the local municipality and other parts of the Eastern Cape and South Africa. Given that these migrant workers will require accommodation and other services there is likely to be an increase in the demand for rental accommodation, social services and access to water and electricity.	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**	• *Provide adequate signage along relevant road networks to warn the motorists of the construction activities taking place on the site.* • *Engage with local authorities and inform them of the development as well as discuss with them their ability to meet the additional demands on social and basic services created by the in migration of workers.* • *Where feasible, assist the municipality in*	**LOW -** **LOW -** **NO IMPACT**

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	There are a number of clinics and hospitals located throughout the municipal area, including a small clinic in the immediate study area. Given the proximity of the development site to these settlements it is most likely that these health facilities will experience additional demand for medical services brought about by the influx of works and job seekers. It is also likely that construction workers coming from outside of the area may wish to be accommodated in rental accommodation establishments found in the nearby towns such as Cofimvaba, Komani and Mthatha which offer B&Bs, hotels and self-catering accommodation establishments. Water, sewerage, and electrical infrastructure in the Instika Yethu local municipality is noted to be aging and poorly maintained. Water for use by the site camp during construction will likely be obtained from the closest viable groundwater and/or surface water sources, to be determined and licensed through a Water User License Application process. Electricity for the site camp is likely to be provided through access to the closest Eskom off-take point with a backup generator in case of outages. Where no off-take point exists, a generator will be used exclusively. Water and electrical connections during the construction phase will therefore not adversely affect existing municipal infrastructure. Due to the aging infrastructure and the existing lack of access to water within the area, the developer and EPC contractor would need to ensure the site is well equipped and backed-up with the necessary infrastructure in order to avoid further damage of the infrastructure found in the area prior to the construction phase taking place. Ultimately, the aim before the construction phase commences should be to leave the site area in a better condition than what it was found.			*ensuring that the quality of the local social and economic infrastructure does not deteriorate through the use of social responsibility allocations.* • *The developer and EPC contractor should ensure prior to the construction phase that they make use of their own mobile social services and economic infrastructure as far as possible, i.e., the use of a mobile clinic on site for the construction team as well as a generator for their own electricity supply as well as water tanks and boreholes as suitable water sources*	

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	The effects of the development on road infrastructure should also be considered as it is highly likely that the development will lead to an increase in traffic volumes on the surrounding road network. This could lead to a deterioration of local road conditions, specifically which are already in a poor state of repair. The deterioration of the road network could place additional financial burdens on the municipality through additional maintenance costs. Based on the above discussion is expected that the housing and accommodation situation, basic service provision, health facilities and road infrastructure will be under additional pressure during the construction period as additional people will be working in the area. These impacts can however be mitigated if the developer engages with the local municipality and plans accordingly.				
CHANGES TO THE AREA'S SENSE OF PLACE	A community's 'sense of place' is developed over time as it embraces the surrounding environment, becomes familiar with its physical properties and creates its own history (Lynch, 1981). The sense of place is created through the interaction of a number of different factors such as the areas visual resources, its aesthetics, climate, culture and heritage as well as the lifestyle of individuals that live in and visit the area (Steele, 1981). Most importantly, it is a highly subjective matter and dependent on the demographics of the population that resides in the area and their perceptions regarding trade-offs. For example, a community living in poverty is generally more likely to be accepting of industrial development that promises employment opportunities while a more affluent residential area is more likely to oppose such a development on the grounds that the development is likely to have an adverse impact on property values. The area proposed for the development as well as its surrounds is predominantly rural in nature. Accordingly, most properties that	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**	• *The mitigation measures proposed by the visual and noise specialists should be adhered to.* • *Natural environments that are not affected and needed by the proposed development should remain untouched. Regulations of boundaries of such areas need to be made transparent between the local community's leaders, the developer and EPC contractor prior to the development's construction phase.* • *Efforts should also be made to avoid disturbing such sites during construction.*	**LOW -** **LOW -** **NO IMPACT**

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	have a high degree of visual exposure to wind energy facilities and their related infrastructure already have a high degree of visual exposure to all existing structures and infrastructure present in the area. Any rapid changes that significantly alter the characteristics that define the area's sense of place could potentially have a negative impact. During the construction of the wind energy facility and it related infrastructure there are likely to be some minor temporary noise impacts caused by the movement of vehicles as well as construction activities on site. These impacts are anticipated to occur primarily				
VISUAL IMPACT ASSESSMENT					
VISUAL IMPACT OF CONSTRUCTION ACTIVITY	During the construction period, there will be an increase in heavy vehicles utilising the roads to the construction sites that may cause, at the very least, a visual nuisance to other road users and landowners in the area in close proximity (within 5km). Within the region, dust as a result of construction activities may also be visible, as such it will result in a visual impact occurring during construction.	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **NO IMPACT** **NO IMPACT**	*Ensure that vegetation is not unnecessarily removed during the construction period.* *Reduce the construction period through careful logistical planning and productive implementation of resources.* *Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible.* *Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.* *Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.*	**MODERATE -** **NO IMPACT** **NO IMPACT**

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				• *Reduce and control construction dust using approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).* • *Where possible, restrict construction activities to daylight hours in order to reduce lighting impacts as much as possible.* • *Rehabilitate all disturbed areas immediately after the completion of construction works.*	
VISUAL IMPACT OF CONSTRUCTION LIGHTING	During the construction period, there will be an increases light activity at night as a significant amount of construction activities will take place during the night since Turbine erection often has to be done at night when the wind speeds are lower. This will pose a visual nuisance to other road users and landowners in the area in close proximity (within 5km), as such it will result in a visual impact occurring during construction.	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **NO IMPACT** **NO IMPACT**	• *Reduce the construction period through careful logistical planning and productive implementation of resources.* • *Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.* • *Where possible, restrict construction activities to daylight hours in order to reduce lighting impacts as much as possible.*	**HIGH -** **NO IMPACT** **NO IMPACT**
OPERATIONAL PHASE					
AQUATIC IMPACT ASSESSMENT					
NONE IDENTIFIED BY SPECIALIST					
AVIFAUNAL IMPACT ASSESSMENT					
DISTURBANCE OF BIRDS DURING CONSTRUCTION	The indications from operational wind farms are that this impact may be of fairly low importance, although it is acknowledged that a longer term or more detailed means of measuring this impact may be required. We judge the significance of this impact to be MODERATE NEGATIVE pre mitigation and LOW NEGATIVE post mitigation.	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **LOW -** **NO IMPACT**	• *A post construction inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species. It is essential that the new*	**LOW -** **LOW -** **NO IMPACT**
DISPLACEMENT OF	As for disturbance above, the indications from operational wind	**DIRECT**	**MODERATE -**		**LOW -**

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BIRDS DURING OPERATIONS	farms are that this impact may be of fairly low importance, although it is acknowledged that a longer term or more detailed means of measuring this impact may be required. We judge the significance of this impact to be MODERATE NEGATIVE pre mitigation and LOW NEGATIVE post mitigation.	**CUMULATIVE** **NO-GO**	**LOW -** **NO IMPACT**	*wind farm does not create favourable conditions for such mammals in high risk areas. We therefore recommend that within the first year of operations a full assessment of this aspect be made by the ornithologist contracted for post construction monitoring. If such conditions have been created case specific solutions will need to be developed and implemented by the wind farm.* • *A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding. This programme will reduce the amount of available vulture food on site and reduce vulture-turbine collision risk. This programme will require the deployment of a dedicated (i.e. no other tasks) and adequately resourced (transport, binoculars, GPS, cameras, training) team of staff to patrol the full site during all daylight hours. This team will need to have a vehicle and the appropriate equipment to be able to dispose of large dead animals off site. This programme must be operational by the time the first turbine blades are turning on site and should not wait for COD. A full detailed protocol for this programme is included as Appendix 10*	**LOW -** **NO IMPACT**
COLLISION OF BIRDS WITH TURBINE BLADES	Human caused fatalities of regionally Red listed or otherwise threatened bird species are always cause for concern and should be avoided as far as possible. The estimated fatalities we have predicted are therefore of concern for the relevant species, in particular Cape Vulture. There are currently no established thresholds for acceptable impacts on bird species in South Africa. However, our own work elsewhere in the country using the method known as 'Potential Biological Removal or PBR' has established that the Cape Vulture cannot sustain any fatalities from wind energy in South Africa. Other anthropogenic threats in existence prior to renewables (predominantly power line electrocution and collision) already take up any fatalities that the species' population can sustain annually. The fatality threshold for any wind farm in South Africa therefore emerges as zero. We conclude that the impact of bird collision with turbines pre-mitigation is of VERY HIGH NEGATIVE significance. This must be effectively mitigated if the project is to proceed. There are various mitigation measures described in Section 11 which could reduce the significance. The degree of this reduction is however uncertain as the mitigation measures are largely unproven in South Africa. Mitigation would need to be 100% effective, or very close to that in order for the risk to be acceptable. Even an efficacy of 80% would result in several Cape Vulture fatalities per year, which is not sustainable for the species. Based on current information we judge that the significance post mitigation will remain at HIGH NEGATIVE. It is conceivable that in the coming years mitigation will be proven to be effective enough to revise this finding, but at this point we do not have sufficient confidence in the mitigation. It is likely that the	**DIRECT** **CUMULATIVE** **NO-GO**	**VERY HIGH -** **MODERATE -** **NO IMPACT**		**HIGH -** **MODERATE -** **NO IMPACT**

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	various available mitigation measures will be used at other wind farms in South Africa in the near and this could improve our confidence in these measures for the proposed project before construction.			*and must be updated and included in the BMP/EMPr. This programme should, if possible, be combined with the initiation of a 'vulture restaurant' a suitable distance off site – where vultures are fed (and the above-mentioned carcasses are disposed of) in order to provide an attraction for vultures away from the turbines. » An observer or technology led turbine Shutdown on Demand (SDOD) programme must be implemented on site from COD. In South Africa, observer led SDOD has recently shown promise at an operational wind farm in the Western Cape. It is likely that by the time of construction of the proposed project more experience on this mitigation will be available in country. This is required in order to mitigate the risk of turbine collision for Cape Vulture in particular, but will also address risk to other species. If an observer led programme is used, this programme must consist of a suitably qualified, trained and resourced team of observers present on site for all daylight hours 365 days of the year. This team must be stationed at vantage points with full visible coverage of all turbine locations. The observers must detect incoming priority bird species, track their flights, judge when they enter a turbine proximity threshold, and alert the control room to shut down the*	
COLLISION OF BIRDS WITH OVERHEAD POWERLINES	Birds could perch on the pylons/towers of the overhead power line and be at risk of electrocution if the design is not bird friendly. Birds in flight could collide with the overhead cables, particularly the earth wire. Collision and electrocution of birds on overhead power lines on site is anticipated to be of HIGH NEGATIVE significance pre-mitigation. Both of these impacts can be mitigated successfully in our opinion to reduce the significance to LOW NEGATIVE. In both cases the first and foremost approach to mitigation should be the selection of the shortest and most sensible possible length of new overhead power line to be constructed and the optimal route for this line. To mitigate for collision of the relevant species, it is recommended that the conductors on the high bird collision risk sections of the line be fitted with the best available (at the time of construction) Eskom approved anti bird collision line marking device. This should preferably be a dynamic device, i.e. one that moves as it is believed that these are more effective in reducing collisions, especially for bustards (see Shaw 2013), which are one of the key species (Denham's Bustard) in this area. It is recommended that a durable device be used as this area is clearly prone to a lot of strong wind and dynamic devices may be susceptible to mechanical failure. It will be either EDFR or Eskom's responsibility to ensure that these line marking devices remain in working order for the full lifespan of the power line, as we cannot afford to have significant numbers of bird collisions on this new line. It is important that these devices are installed as soon as the conductors are strung, not only once the line is commissioned, as the conductors pose a collision risk as soon as they are strung. The devices should be installed alternating	**DIRECT**	**HIGH -**		**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		**NO IMPACT**
ELECTROCUTION OF BIRDS PERCHED ON PYLONS/TOWERS		**DIRECT**	**HIGH -**		**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		**NO IMPACT**

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	a light and a dark colour to provide contrast against dark and light backgrounds respectively. This will make the overhead cables more visible to birds flying in the area. Note that 100% of the length of each span needs to be marked (i.e. right up to each tower/pylon) and not the middle 60% as some guidelines recommend. This is based on a finding by Shaw (2013) that collisions still occur close to the towers or pylons. It is also recommended that the stay wires on the met masts on site be installed with these devices as soon as possible. In the case of bird electrocution, the power line must be built on an Eskom approved bird-friendly pole structure which provides ample clearance between phases and phase-earth to allow large birds such as vultures to perch on them in safety. This typically means a phase-phase and phase-earth typical clearance of at least 1800mm, and a Bird Perch on top of any monopoles.			*relevant turbine until the risk has reduced. A full detailed protocol is included in Appendix 11 and must be updated and included in the BMP/EMPr. If a technology led option is used, preference should be given to a system that has been independently reviewed for efficacy. We crudely estimated how many shutdowns could be expected based on pre-construction monitoring data. When Cape Vulture flight paths are clipped to a 500m proximity to the current turbine layout, 26 records were made in 360 hours of observation. This translates into a passage rate of 0.072birds/hr. Converting this to a year results in approximately 315 shutdown events per year. At an assumed 10 minutes shutdown at 1 turbine per event, this means 3 150 minutes of turbine downtime in a year. The facility of 36 turbines will operate for a total of 18 921 600 minutes per year (24hrs x 60 minutes x 365days x 36 turbines) this equates to 0.01% lost operating time. Even if the estimate is wrong and the real loss is ten times higher, it would be 0.1%. EDFR has confirmed that this is acceptable to them.* • *One blade on each turbine must be painted subject to Civil Aviation Authority and turbine manufacturer regulations. Provision must be made by*	

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				the developer for the resolution of any technical, warranty, supplier challenges that this may present. If this cannot be resolved, the developer will be responsible for substituting this with a suitable alternate mitigation measure in consultation with the ornithologist. • *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off site. The facility will need to address other sources of mortality of priority species in a measurable way (according to best practice) so as to compensate for residual effects on the facility itself. An example of such off-site mitigation could be the retrofitting of insulation onto existing Eskom power lines in the project vicinity which pose an electrocution risk to vultures. This is a measurable impact which is not currently mitigated adequately by Eskom due to the cost. The project could contribute to the cost of such mitigation. Note: in April-May 2023 it was decided between the EAP, ecological specialist and avifaunal specialist that the presence of CBA1 areas on site triggered the need for an offset. Since the main trigger for this is Cape Vulture, a Cape Vulture offset plan was developed and will be implemented.* • *The monitoring programme compiled for construction and post construction,*	

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				outlined in Appendix 9, should be implemented according to the latest available version of the best practice guidelines at the time. The findings from operational phase monitoring should inform an adaptive management programme to mitigate any impacts on avifauna to acceptable levels.	
BAT IMPACT ASSESSMENT					
BAT FATALITIES FROM COLLISION WITH TURBINES, AND POTENTIAL POPULATION DECLINES	During operation of the WEF, there will be inevitable fatality of bats from their collision with turbines. As no turbines are proposed in High or Medium-High sensitive areas, this inevitable impact was rated with High significance. The significance of this impact could be reduced to Medium if all turbines in Medium sensitive areas are subject to curtailment below an initial cut-in speed of 5 m/s during temperatures of 12 °C or warmer for four hours after sunset from 1 June to 31 October, and from sunset to sunrise from 1 November to 31 May. The 5 m/s turbine cut-in wind speed represents the wind speed associated with approximately 50% of all bat activity recorded at 73-110 m above ground level in 2021/2022 by IWS. In addition to this proper bat fatality monitoring and adaptive management of bat fatalities must be performed during operation.	**DIRECT** **CUMULATIVE** **NO-GO**	**VERY HIGH -** **NO IMPACT** **NO IMPACT**	• *Implement curtailment of turbines in Medium sensitive areas, as soon as the first turbine is operational, below an initial cut-in speed of 5 m/s during temperatures of 12 °C or warmer for four hours after sunset from 1 June to 31 October, and from sunset to sunrise from 1 November to 31 May. The 5 m/s turbine cut-in wind speed represents the wind speed associated with approximately 50% of all bat activity recorded at 73-110 m above ground level in 2021/2022 by IWS.*	**MODERATE -** **NO IMPACT** **NO IMPACT**
DECLINE OR LOSS OF BAT ECOSYSTEM SERVICES	If high bat fatalities lead to declines in certain species populations, the ecosystem services that these populations provide will be compromised. As many locally occurring bat species are insectivorous, their eco-services mainly relate to insect (including pest) species predation and population regulation. However, up to three fruit bat species may occur, which would provide plant pollination and seed dispersal services for various indigenous woody (forest) plant species. Without mitigation, a potential decline or loss of these services was rated with Medium significance. This could be reduced to Low significance by effectively mitigating the afore-mentioned impacts	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **NO IMPACT** **NO IMPACT**	• *Minimize degradation of terrestrial habitat (potential bat foraging and roosting habitat). Implement and maintain effective invasive alien plant, stormwater, erosion, sediment, and dust control measures.* • *Ensure that turbines can be fitted with bat detectors and deterrent devices. Turbine engineers must consult with bat specialists to incorporate the necessary turbine adaptations for this during the*	**LOW -** **NO IMPACT** **NO IMPACT**

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CUMULATIVE IMPACT (100KM)	The potential cumulative impact on bats from the proposed Ngxwabangu WEF and some other proposed renewable developments in the immediate surrounds is an additional concern. Shown in Figure 16 is, within a 100 km radius of the proposed Ngxwabangu WEF site, the location and extent of renewable energy projects for which environmental impact assessment applications have been received by the Department of Forestry, Fisheries and the Environment (Renewable Energy EIA Application Map, February 2022). Existing wind farms in the broader surrounds include, but may not be limited to, the Chaba, Amakhala Emoyeni, Dorper, and Noupoort facilities. Without very diligent monitoring and mitigation of bat fatalities and other impacts (e.g. roost disturbance) at all WEFs in the region, their potential cumulative impact on bat habitats, populations, and ecosystem services was rated with Medium significance. Only with proper bat fatality monitoring and adaptive management of bat fatalities using turbine curtailment and other secondary mitigation measures, may the cumulative impact of these WEFs on bats be reduced to Low significance.	**CUMULATIVE**	**MODERATE -**	*design phase, so there are no unexpected surprises or concerns after the turbines are built.* • *Minimize artificial lighting on site. Apart from compulsory civil aviation lighting, minimize artificial lighting - especially high-intensity, steady-burning, sodium vapour, quartz, halogen, and other bright lights at sub-stations, offices, and turbines. All non-aviation lights should be hooded downward and directed to minimise horizontal and skyward illumination. Where possible, solar-powered motion-sensitive lights should be used.* • *Perform operational bat monitoring as soon as the first turbine is operational - as per the latest SABAA guideline for this (Aronson et al. 2020 or later). The quality of the operational monitoring and data analysis are to be conducted to a high standard so that there is confidence in the data and the fatality estimate results.* • *Adaptively manage bat fatalities by consulting the latest SABAA guideline for this (Aronson et al. 2020 or later), and the best available relevant scientific information. The specialist conducting the Year 1 and Year 2 operational monitoring should provide recommendations for adaptive management of the above strategy after*	**MODERATE -**

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				the second year of operational monitoring. Allowance should be made in the financial provision for adaptive management and mitigation of bat fatalities. - *If the operational bat monitoring and data analysis are not conducted properly as per Aronson et al. 2020 (or later), and/or if the bat fatality threshold is exceeded (determined as per MacEwan et al. 2018 or later), improved bat fatality mitigation must be promptly implemented. Unless the WEF's operational bat monitoring data suggest otherwise, and/or unless there are other measures that have been proven to effectively mitigate bat fatalities at WEFs, turbine curtailment should be implemented below an initial cut-in speed of 7 m/s during temperatures of 12 °C or warmer for four hours after sunset from 1 June to 31 October, and from sunset to sunrise from 1 November to 31 May. The 7m/s turbine cut-in wind speed represents the wind speed associated with approximately 80% of all bat activity recorded at 73-110 m above ground level in 2021/2022 by IWS.* - *Submit quarterly and annual bat fatality monitoring reports to SABAAP (the South African Bat Assessment Association Panel), EWT (the Endangered Wildlife Trust), and the*	

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				DEFF (the national Department of Environment, Forestry and Fisheries). • *Forward all (live and fatality) bat monitoring data to the database recommended by SABAA to expand the scientific knowledge base for more informed decision making and mitigation.* • *Rehabilitate disturbed terrestrial habitat and water resources (bat foraging habitat). Implement effective rehabilitation of disturbed terrestrial habitat and water resources based on consultation with an appropriate experienced specialist(s). Carefully manage alien vegetation, livestock grazing, and water points.*	
ECOLOGICAL IMPACT ASSESSMENT					
DISTURBANCE AND/OR DEATH OF FAUNAL SPECIES	Direct & Indirect Impact (Preferred Alternative) During the operational phase, noise and light pollution associated with the operation and maintenance of the proposed development is likely to disturb faunal populations utilising the project area. WEFs release low frequency sound (or infrasound), inaudible by humans but which can interrupt communication between faunal species. Additionally, operational activities such as vehicular movement and noise are likely to disturb faunal species and could result in the movement of faunal species away from the affected areas and/or the loss of faunal species. Slow-moving species such as tortoises and snakes are particularly susceptible to road kills. As such, this impact is rated moderate negative. Cumulative Impact Operational activities associated with the proposed development	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **MODERATE -**	• *Regular maintenance and checks of the infrastructure must be undertaken.* • *External lighting should be avoided where possible. However, if required, lighting should be down lighting and low wattage.* • *Access to the site should be minimised.* • *All individuals must sign a register prior to accessing the proposed development site.* • *Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads.*	**LOW -** **LOW -** **LOW -**

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	such as vehicular movement and noise are likely to increase the disturbance of faunal species caused by existing developments and activities within the broader study area. As such, this impact is rated moderate negative. No-Go Alternative Existing developments and activities will continue to disturb faunal species within the broader study area, even in the absence of the proposed development. The no-go alternative therefore is rated moderate negative.				
DISRUPTION OF ECOSYSTEM FUNCTION AND PROCESS / HABITAT FRAGMENTATION	Direct Impact The establishment and operation of roads, turbine hard stands, fences, and other associated infrastructure within the landscape is likely to cause habitat fragmentation. Habitat fragmentation disrupts ecosystem function and processes such as pollination and dispersal, and causes population fragmentation and isolation, reducing variations in the gene pool and a decrease in species richness and diversity and ultimately, biodiversity. Cumulative Impact Disruption of ecosystem function and process due to habitat fragmentation has already occurred within the broader area due to roads, farm boundary fences, and agricultural activities, plantations, amongst others. As such, the operation of the proposed Ngxwabangu WEF will contribute to the cumulative habitat fragmentation and disruption of ecosystem function and process within the broader landscape. No-Go Alternative Under the no-go alternative, the existing habitat fragmentation due to roads, farm boundary fences, plantations, and agricultural activities will persist. As such, under the no-go alternative the impact is rated moderate negative.	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **MODERATE -**	⅄ *All areas disturbed during construction that do not form part of the proposed development must be rehabilitated. Topsoil from nearby areas of the same vegetation type must be spread over impacted area and planted with indigenous plant species.* ⅄ *The layout and design of the proposed WEF must allow for connectivity within the landscape.* ⅄ *A Fire Management Plan must be drafted by a suitably qualified specialist and implemented during the operation of the proposed Ngxwabangu WEF.*	**MODERATE -** **MODERATE -** **MODERATE -**

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INFESTATION OF ALIEN PLANT SPECIES	Direct Impact Failure to rehabilitate and monitor the establishment of alien plant species during the Construction (and Operation Phase) could lead to the spread and infestation of Alien Plant Species during the Operational Phase. Alien plant species often outcompete indigenous vegetation. Therefore, their establishment and spread could result in the loss of indigenous plant species. Cumulative Impact Alien Plant Species such as *Acacia mearnsii* and *Pinus sp*, amongst others, have already established in the surrounding area. Therefore, should the operation of the proposed Ngxwabangu WEF lead to the further establishment of alien invasive species in the project area, the invasion by alien species could be exacerbated. No-Go Alternative Alien Invasive Plant Species have already established within the project area. Under the no-go alternative these species are likely to continue multiplying if left unchecked. The current no-go alternative is therefore classified as moderate.	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **MODERATE -**	▲ *The site must be checked regularly for the presence of alien invasive species. When alien invasive species are found, immediate action must be taken to remove them.* ▲ *The ECO must create a list with accompanying photographs of possible alien invasive species that could occur on site prior to construction. This photo guide must be used to determine if any alien invasive species are present.* ▲ *An Alien Invasive Management Plan must be compiled and implemented during the Construction and Operational Phase of the proposed Ngxwabangu WEF.*	**MODERATE -** **MODERATE -** **MODERATE -**
HERITAGE IMPACT ASSESSMENT					
NONE IDENTIFIED BY SPECIALIST					
NOISE IMPACT ASSESSMENT					
OPERATIONAL NOISE OF WIND TURBINES: DAYTIME	Noise levels generated by operating WTG (using maximum worst-case SPL). Considering potential effect of wind-induced noises on ambient sound levels as illustrated in Figure 4-30 as well as the noise limits as motivated in section 6.4 and defined in Table 6-2 of the Noise Impact Assessment, this assessment will assume an ambient sound level of 45.5 dBA (at a wind speed of 12 m/s). Operational noise levels from the WTG should not result in noise	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **NO IMPACT** **NO IMPACT**	▲ *The applicant must confirm the status of the structures where noise levels exceed 42 dBA (during the operational phase), confirming whether it is used for residential purposes. People staying in structures where calculated noise levels exceed 45 dBA could be relocated, or the applicant can select appropriate mitigation measures to ensure that the total noise levels are less than 45 dBA at*	**LOW -** **NO IMPACT** **NO IMPACT**

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	levels exceeding the 45 dBA (as motivated in Table 6-2 of the NIA).			*the closest NSR, which could include (one or a combination of):* ○ *The applicant can select a WTG with a lower SPL (e.g., a WTG with a SPL less than 106.5 dBA re 1 pw); or* ○ *The layout must be changed to locate WTG further from NSR, considering the potential cumulative effect of all WTG located within 2,000 m from NSR; or* ○ *The applicant can develop a noise abatement program to reduce the noise emission levels (when using a WTG that offer such an option) at certain wind speeds, and/or if the wind blows in a certain direction.*	
OPERATIONAL NOISE OF WIND TURBINES: NIGHTTIME	Noise levels generated by operating WTG (using maximum worst-case SPL). Considering potential effect of wind-induced noises on ambient sound levels as illustrated in Figure 4-30 as well as the noise limits as motivated in section 6.4 and defined in Table 6-2, of the Noise Impact Assessment, this assessment will assume an ambient sound level of 45.5 dBA (at a wind speed of 12 m/s). Operational noise levels from the WTG should not result in noise levels exceeding the 45 dBA (as motivated in Table 6-2 of the NIA).	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **NO IMPACT** **NO IMPACT**		**LOW -** **NO IMPACT** **NO IMPACT**
PALAEONTOLOGICAL IMPACT ASSESSMENT					
None identified by specialist					
SOCIO-ECONOMIC IMPACT ASSESSMENT					
SUSTAINABLE INCREASE IN PRODUCTION AND GDP IN THE STUDY AREA, REGIONAL AREA AND NATIONALLY	The total impact on production in the country as a result of the wind energy facility and its related infrastructure's operations will equate to R110.7 million in 2021 prices per annum. Aside from the utilities sector, industries that will experience the greatest stimulus from the project will include electrical machinery and apparatus, insurance, and transport service. Due to the annual spending on labour and procurement of local goods and services required to operate and maintain the wind energy facility and related infrastructure (i.e., utilities, sundries, certain electrical components, security etc.). A large proportion of	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE +** **MODERATE +** **NO IMPACT**	⅄ *The operator of the wind energy facility and its related infrastructure should be encouraged to, as far as possible, procure materials, goods and products required for the operation and maintenance of the facility from local suppliers to increase the positive impact in the local economy.* ⅄ *Aspiring entrepreneurs from the local communities should be encouraged to formally register their MSMEs in order to*	**MODERATE +** **MODERATE +** **NO IMPACT**

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	OPEX is expected to be related to highly specialised technical maintenance and off-site operation and monitoring of the WEF while only a smaller proportion of this direct spend will be circulated within the study area in the form of site maintenance and clearing, road maintenance as well as security. Although attributed as direct spend impacts on production and GDP is likely to be experienced more at a provincial and national level. It is estimated that the project will directly generate R29.5 millions of value-added per annum. Through indirect and induced effects, an additional R28.3 millions of GDP will be generated per annum, which means that the total impact of the project on the national GDP will equate to R57.8 million per annum in 2021 prices. In addition to the operational expenditure required to operate and maintain the WEF, the applicant (developer) is required to demonstrate certain commitments to empowerment and economic development within the designated local area as required by the National Energy Regulator of South Africa in relation to an Application for an Electricity Generation Licence in terms of the Electricity Generation Act (No. 4 of 2006). The developer of the proposed WEF has communicated that their total forecasted ED and SED spend for the fully operational WEF will be in order of 2.5% of the Gross Annual Revenue generated. The proposed wind energy facility intends to empower the immediately affected communities by delivering on various development-type initiatives and establishment of small businesses. As per previous research carried out by the developer in the area, the following business types have been identified for support given the community's existing experience and aptitude: ▪ Farming (vegetables, crops and livestock)			*do business with the IPP- this would specifically apply to MSMEs within the security and cleaning/cleansing sub-industries.* *Improved energy supply in the country.* *Reduced carbon emissions in generation of electricity.* *Sufficient economies of scale could be created to establish new businesses in the provincial economy. These businesses could then supply the goods and services required for the operation and maintenance of the facility that cannot currently be procured in the area. This would contribute to the local economies' growth and development. Given that this project would be the first of its kind within the region, these cumulative impacts will only materialise over time.*	

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	▪ Carpentry enterprises ▪ Plant-hire businesses ▪ Construction businesses ▪ Artisanal enterprises ▪ Tourism (product development) The contribution aims to assist aspiring entrepreneurs including women-owned enterprises and the youth with mentorship, skills transfer and development capital. The skills development initiative proposed by the developer will be suited to the needs to the community and would require close collaboration with representatives of the community members as well as businesses owners from the immediate study area for all the affected parties to benefit and be appropriately empowered. In addition to the planned commitment of ED and SED spend within local communities, The Ngxwabangu WEF will be entering into a rental commitment with the Mtshanyane, Ncora Flats, Mcambalaleni and Ncuncuzo administrative area/traditional councils. This will see approximately 2% of the total WEF's turnover committed towards rental payments split pro-rata according to the number of turbines and associated infrastructure located on the land of each community.				
CREATION OF SUSTAINABLE EMPLOYMENT POSITIONS NATIONALLY AND LOCALLY	The ongoing operation, maintenance and monitoring of the wind energy facility and its associated infrastructure will directly create 17 FTE employment positions all of which will be retained for the lifespan of the development. Aside from the direct employment opportunities, the wind energy facility and the associated infrastructure will support a further estimated 32 FTE employment positions created through production and consumption induced effects. Due to the spatial allocation of procurement spending and direct	**DIRECT** **CUMULATIVE** **NO-GO**	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**	▪ *Where possible, local labour should be considered for employment to increase the positive impact on the local economy.* ▪ *Only source Cape Vulture and other live birds and animal spotters from the immediate study area.* ▪ *As far as possible, local small and medium enterprises should be approached to investigate the*	**VERY HIGH +** **VERY HIGH +** **NO IMPACT**

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	employment created, most of the indirect and induced positions will also be created within the broader Eastern Cape and national economies, with only a portion being created in the primary and secondary study areas. The trade, utilities and community and personal services sectors will benefit the most from these new employment opportunities. **Employment of local birdwatchers as a mitigation strategy for Cape Vulture conservation in the study area:** The Cape vulture is considered an endangered species within South Africa. According to Birdlife South Africa, there has been a decline in reported fatalities of Cape vultures around the country, however, wind energy farms have been recognised as a potential threat to the conservation of remaining Cape vultures in the country (Birdlife,2018). The developer has indicated that it is a major priority to mitigate against the potential loss of Cape vultures as a result of the proposed development. A means of mitigating against the loss of birdlife in the area, the proposed wind energy facility's developers planning to implement a bird monitoring programme in and around the site location. The implementation of the programme will not only protect the birdlife, but it is also expected to be a major contributor to employment and skills development and provide a gateway for further education within the environmental conservation space for local community members particularly the youth. The aforementioned mitigation process requires certain skills at three different levels and is summarised in the Figure here within. ▪ Level one: The bird monitoring programme requires no specific skill set at level one but does offer on-the job training prior to the operational phase taking place. The nature of this level would expect prospective community members work in pairs with each pair operating on five to six turbines, in search of carcasses around and within the			*opportunities for supply inputs required for the maintenance and operation of the wind energy facility and related infrastructure.* *Improved living standards of the directly and indirectly affected households.*	

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	site below the turbines. The nature of employment at this level would be full-time and is expected to have a time period of two years once the wind energy facility has started operating. On-going monitoring could potentially extend periodically after the two year period. ▪ Level two: This particular level is similar to the first level in terms of its skills requirements. At this level, workers would need to search and seize for dead livestock around the site either by foot or by means of a suitable vehicle before the vultures are attracted to the decaying animal bodies on the site and near the wind turbines. By foot, it would be done in groups of six to eight workers who would be expected to report findings of the dead animals. The dead animals would then be dropped off at an allocated site away from the wind energy facility which will serve as a "vulture restaurant" and steer the direction of the vultures away from the turbines. At this level, employees would be managed and receive refresher training and would be employed for the duration of the lifespan of the proposed wind energy facility. ▪ Level three: This level is regarded as the most critical level of the birdwatching programme and vital to its intended success. Here, workers would be expected to be on site and communicate regularly with the wind turbine controllers in the operating room off-site. This communication would potentially lead to the shutting down of certain turbines on demand. This would occur in instances where vultures are spotted on site in close proximity to the wind turbines. Individual turbines closest to the vulture/s in question can then be immediately shutdown until the respective vulture/s have cleared the area. These workers would operate in a shift system where eight to 10 workers will operate during one shift				

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	and each worker would have the responsibility of monitoring four to five turbines. The workers would need binoculars and radios for spotting vultures and contacting the control room in an efficient manner. This level offers a unique accreditation opportunity with Birdlife South Africa for workers at this level. Each of the levels from the bird monitoring programme would have a team leader and offer appropriate guidance and training for the respective tasks required at each specific level. The nature of this particular job may subjectively come across as demotivating to individuals but the work experience does however offer career elevation within the environmental conservation and tourism spheres for prospective students in the study area as well as for unemployed graduates seeking formal employment in the environmental or tourism industries. As part of the developers future SED obligations within the local community it is proposed that dedicated workers from the birdwatching programme should be identified for selection and awarding of bursaries in order to obtain a formal tertiary education in a related field in which they would have already gained practical experience.				

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	 • Carcass searching in pairs • No skills required • Compensation of about R6000-7000 p/m • Receive on-the-job training • Employed full-time for approximately 2 years  • Dead livestock searching in pairs with suitable transport for collection of dead animals • Done in groups of 6-8 without transport • Take dead animals to "vulture restaurant" • Managed and receive refresher training • Employed for the full life span of the project  • Shutdown of turbines on demand • Spot vultures on site and contact control room to shut down turbines • Done in a shift system with 8-10 workers per shift • Opportunity for accreditation with Birdlife SA				
SKILLS DEVELOPMENT OF PERMANENTLY EMPLOYED WORKERS	South Africa has serval wind energy facilities with a significant number of these wind farms being located in the western regions of the Eastern Cape. As such, it is assumed that the skills base for operating and maintain such facilities should be easily accessible. It is likely that highly skilled personnel would need to be recruited from outside of the study area and the Intsika Yethu local municipality. These employees would include skilled "mechatronics" engineers (specialised in both electrical and mechanical engineering) likely to be recruited from the other parts of the Eastern Cape such as Nelson Mandela Bay Municipality and trained by the manufacturer, as well as less skilled services such as safety and security and mechatronic assistants. Maintenance will	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW +** **LOW +** **NO IMPACT**	• *The developer should consider establishing vocational training programmes for the local labour force to promote the development of skills required by the wind energy facility and their related infrastructure and thus provide for the opportunities for these people to be employed in other similar facilities elsewhere.* • *Development of new skills and expertise in the country to support the development of the renewable wind*	**MODERATE +** **MODERATE +** **NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
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	be carried out throughout the lifetime of the wind energy facility. A maintenance schedule usually involves an initial inspection after commissioning, semi-annual inspections, an annual inspection and two- and five-year inspections but this varies according to the wind energy facility. The aforementioned birdwatching programme would not only contribute to employment but also skills development in the primary study area. Provided the fact that there are three distinct levels attached to the programme, it should be noted that the programme offers further career development opportunities for the respective community members. The universities within the Eastern Cape province offer various environmental conservation and tourism courses that workers could enrol for in the future through bursary opportunities or other sources of funding. The universities in the Eastern Cape namely; Nelson Mandela University, Rhodes University, Walter Sisulu University and The University of Fort Hare, have several nature conservation and tourism courses available that the workers could take on should they feel the need to further their skills and education development in the nature conservation and tourism fields. Table 4.6 of the SEIA provides information on the courses on offer at the four different tertiary institutions. In addition to the above tertiary education options, the developer should also be encouraged to support promising candidates from the said programme to obtain accredited trade-orientated vocational skills. These skills programmes could assist respective workers to move into formal careers such as: ▪ Game ranging ▪ Environmental field monitoring ▪ Site clearing and cleansing			*energy industry.*	

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	▪ Waste collection and recycling				
IMPROVED STANDARDS OF LIVING FOR BENEFITING HOUSEHOLDS	The creation of 90 FTE employment positions throughout the country will generate an estimated R19.4 million of additional household income (2021 prices), which will be sustained for the entire duration of the wind energy facility and its related infrastructure's lifespan. The sustainable income generated as a result of the project's operation will positively affect the standard of living of all benefitting households.	**DIRECT**	**LOW +**	⅄ *Where possible, the local labour supply should be considered for employment opportunities to increase the positive impact on the area's economy.* ⅄ *As far as feasible, local small and medium enterprises should be approached to investigate the opportunities for supply inputs required for the maintenance and operation of the wind energy facility and their related infrastructure.* ⅄ *Improved productivity of workers.* ⅄ *Improved health and living conditions of the affected households.*	**VERY HIGH +**
		CUMULATIVE	**LOW +**		**VERY HIGH +**
		NO-GO	**NO IMPACT**		**NO IMPACT**
PROVISION OF ELECTRICITY NECESSARY FOR ECONOMIC GROWTH	The increasing of the electricity supply will benefit both residents and businesses owners across South Africa including in the Instika Yethu local municipality. The associated infrastructure linked to the wind energy facility will also enhance the reliability of the current supply, help contribute to a reduction in loadshedding, and could permit residences and businesses to have additional access to electricity. The wind energy facility coupled with its associated infrastructure will help to unlock further development in South Africa and to a lesser extent in the Instika Yethu local municipality and study area.	**DIRECT**	**VERY HIGH +**	⅄ *None suggested.*	**VERY HIGH +**
		CUMULATIVE	**VERY HIGH +**		**VERY HIGH +**
		NO-GO	**NO IMPACT**		**NO IMPACT**
LOCAL SOCIO-ECONOMIC DEVELOPMENT AND ECONOMIC DIVERSIFICATION BENEFITS DERIVED FROM THE PROJECT'S OPERATIONS	The proposed wind energy facility will make a notable contribution to economic, social and community development in the area. Communities living within close proximity to the development will benefit from the existence of the development over its 20-year life span as government regulations requires these types of developments to engage in programmes that seek to address the local communities social and economic needs.	**DIRECT**	**MODERATE +**	⅄ *An innovative and site-specific ED and SED programme should be devised by the developer and regularly updated throughout the project's lifespan.* ⅄ *Recommend and advertise accommodation at the Lubisi Lodge and Conference centre for overnight stays*	**VERY HIGH +**
		CUMULATIVE	**MODERATE +**		**VERY HIGH +**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	The current regulations prescribes that a minimum of 1% of the revenue derived by a project should be allocated towards the socio-economic development of the community and a further 0.4% to enterprise development. These contributions are verified by the Department of Energy via quarterly audits to ensure that the figures are achieved. In addition to the proposed project's required contribution towards social and economic enterprise development, the construction as well as the operational phase of the project is expected to contribute towards the local tourism industry, specifically business tourism and educational tourism. Specific mention here is made of Lubisi Lodge and Conference Centre previously mentioned in Chapter 3. During both the construction and operational phase, the Lubisi Lodge and Conference Centre will make for a suitable location for accommodation for project developers, construction managers and facility operation managers. The conference centre would also be a suitable and convenient place to host monthly, quarterly or annual meetings related to the proposed facility. This would be highly beneficial to the facility from both an employment and tourism attraction perspective. As stated in the Chris Hani District municipality IDP, the district municipality aims to increase awareness of environmental sustainability within the district. This includes implementing educational programmes within schools and local communities. The proposed wind energy facility, once it has been completed, will be able to serve as a visitor site for educational purposes by local schools and even TVET College enrolees within the region. Schools may be taken through the process of renewable energy and functioning of wind turbines by operation specialists and learn the			*and hosting meetings and conferences related to the proposed development or for other business ventures and educational tourism expeditions.* • *The developer should encourage the operational manager and team to be open to hosting safe site visits for local schools and colleges for educational purposes.* • *The plan should be developed in consultation with local authorities and local communities to identify community projects that would result in the greatest social benefits.* • *These plans should be reviewed on an annual basis and, where necessary, updated.* • *When identifying enterprise development initiatives, the focus should be on creating sustainable and self-sufficient enterprises.* • *In devising the programmes to be implemented, the developer should take into account the priorities set out in the local IDP.* • *Declining levels of poverty in Instika Yethu local municipality and the Eastern Cape.* • *Improved standards of living of the members of the community and households that benefit from the various programmes.* • *Possible improvements in access to*	

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	importance and significance thereof in relation to the climate change crisis as well as South Africa's current energy supply challenges.			*services and status of local infrastructure.*	
		NO-GO	**NO IMPACT**		**NO IMPACT**
NEGATIVE CHANGES TO THE SENSE OF PLACE	The effects on the community's sense of place will initially be felt during the construction period and will continue into the operational phase. The assessment of the negative change in the sense of place provided for the construction phase will be almost identical to that of the operational phase.	**DIRECT**	**LOW -**	• *The mitigation measures proposed by the visual and noise specialists should be adhered to.* • *Efforts should also be made to avoid disturbing such sites during construction.*	**LOW -**
		CUMULATIVE	**LOW -**		**LOW -**
		NO-GO	**NO IMPACT**		**NO IMPACT**
VISUAL IMPACT ASSESSMENT					
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY (< 5KM) TO THE PROPOSED DEVELOPMENT	The visual impacts of facility operations on sensitive visual receptors (i.e., residents of villages / settlements, as well as, observers travelling along the various secondary roads) in close proximity to the proposed Ngxwabangu WEF (within 5km) is expected to be of very high significance. No mitigation is possible for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates this impact assessment.	**DIRECT**	**VERY HIGH -**	• *During Operations, monitor the general appearance of the facility as a whole, as well as, all rehabilitated areas.* • *The maintenance of the turbines and ancillary structures and infrastructure will ensure that the facility does not degrade, thus aggravating visual impact. Implement remedial action where required.* • *Where sensitive visual receptors are likely to be affected, it is recommended that the developer enter into negotiations regarding the potential screening of visual impacts at the receptor site. This may entail the planting of vegetation, trees or even the construction of screens. Ultimately, visual screening is most effective when placed at the receptor itself.* • *Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial*	**VERY HIGH -**
		CUMULATIVE	**VERY HIGH -**		**VERY HIGH -**
		NO-GO	**NO IMPACT**		**NO IMPACT**
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS WITHIN THE LOCAL AREA (BETWEEN 5 - 10KM) SURROUNDING THE PROPOSED DEVELOPMENT	The visual impact of facility operations on sensitive visual receptors (i.e. users of the various secondary road, visitors to region, and residents of villages / settlements) within the local area (between 5 - 10km offset) is expected to be of high significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates this impact assessment.	**DIRECT**	**HIGH -**		**HIGH -**
		CUMULATIVE	**HIGH -**		**HIGH -**
		NO-GO	**NO IMPACT**		**NO IMPACT**
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS WITHIN THE	The visual impact of facility operations on sensitive visual receptors (i.e. users of the various secondary road, arterial R61 road, visitors to region, and residents of villages / settlements) within the district (between 10 - 20km offset) is expected to be of moderate significance. No mitigation is possible within this environment and	**DIRECT**	**MODERATE -**		**MODERATE -**
		CUMULATIVE	**MODERATE -**		**MODERATE -**
		NO-GO	**NO IMPACT**		**NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
DISTRICT (BETWEEN 10 - 20KM) SURROUNDING THE PROPOSED DEVELOPMENT	for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates this impact assessment.			*actions must be implemented as a when required.*	
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS WITHIN THE REGION (> 20KM)	The visual impact of facility operations on sensitive visual receptors (i.e., users of the various secondary roads, arterial roads R61 and R359, visitors to the region, and residents of villages / settlements) within the region (beyond the 20km offset) is expected to be of low significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates this impact assessment.	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**		**LOW -** **LOW -** **NO IMPACT**
POTENTIAL VISUAL IMPACT OF OPERATIONAL LIGHTING AT NIGHT ON SENSITIVE VISUAL RECEPTORS IN THE REGION	The receiving environment has a relatively small number of populated places, and it can be expected that any light trespass and glare from the security and after-hours operational lighting for the facility will have some significance. In addition, the remote sense of place and rural ambiance of the local area increases its sensitivity to such lighting intrusions. Another source of glare light is the aircraft warning lights mounted on top of the hub of the wind turbines. While these lights are less aggravating due to the toned-down red colour, they do have the potential to be visible from a greater distance then general operational lighting, especially due to the strobing effect of the lights, a function specially designed to attract the viewers' attention. The Civil Aviation Authority (CAA) prescribes these warning lights and the potential to mitigate their visual impacts is low. The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, is recommended to be investigated. Some ground-breaking new technology in the development of strobing lights that only activate when an aircraft is detected	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **NO IMPACT**	• *Aviation standards and CAA Regulations for turbine lighting must be followed.* • *The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, must be investigated.* • *Install aircraft warning lights that only activate when the presence of an aircraft is detected, if permitted by CAA.* • *Shield the sources of light by physical barriers (walls, vegetation, or the structure itself).* • *Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights.* • *Make use of minimum lumen or wattage in fixtures.* • *Make use of down-lighters, or shielded fixtures.* • *Make use of Low-Pressure Sodium*	**MODERATE -** **MODERATE -** **NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	nearby. This may aid in restricting light pollution at night and should be investigated and implemented by the project proponent, if available and permissible by the CAA. This new technology is referred to as needs-based night lights, which basically deactivates the wind turbine's night lights when there is no flying object within the airspace of the WEF. The system relies on the active detection of aircraft by radar sensors, which relays a switch-on signal to the central wind farm control to activate the obstacle lights. Last is the potential lighting impact is known as sky glow. Sky glow is the condition where the night sky is illuminated when light reflects off particles in the atmosphere such as moisture, dust or smog. The sky glow intensifies with the increase in the number of light sources. Each new light source, especially upwardly directed lighting, contributes to the increase in sky glow. The general lighting of the facility may contribute to the effect of sky glow in an otherwise dark environment. The visual impacts as a result of operational lighting at night on sensitive visual receptors in the regions is likely to be of high significance and may be mitigated to moderate should the required CAA lighting be approved to be installed on the perimeter and/or the installation of needs-based night lights be allowed. Best practice guidelines for other general site lighting that may occur on the site have also been taken into consideration. The table below illustrates this impact assessment.			*lighting or other types of low impact lighting.* • *Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.*	
POTENTIAL VISUAL IMPACT OF SHADOW FLICKER ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED DEVELOPMENT	This Impact is described above. Shadow flicker only occurs when the sky is clear, and when the turbine rotor blades are between the sun and the receptor (i.e. when the sun is low). De Gryse in Scenic Landscape Architecture (2006) found that "most shadow impact is associated with 3-4 times the height of the object". Based on this research, a 1km	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **NO IMPACT**	• *None are available.*	**MODERATE -** **MODERATE -** **NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	buffer along the edge of the outer most turbines is identified as the zone within which there is a risk of shadow flicker occurring. Residents on the outskirts of a few villages / settlements and portions of various secondary roads are located within the 1km buffer. It is however expected that the shadow flicker experienced by motorist traveling along roads will be fleeting and not constitute a shadow flicker visual impact of concern. The significance of shadow flicker is therefore anticipated to be High. .				
ANCILLARY INFRASTRUCTURE	On-site ancillary infrastructure associated with the Ngxwabangu WEF includes a 132kV collector substation, 132kV overhead powerline, underground 33kV cabling between the wind turbines, internal access roads, operations and maintenance buildings and a Battery Energy Storage System (BESS). No dedicated viewshed analyses have been generated for the ancillary infrastructure, as the range of visual exposure will fall within (and be overshadowed by) that of the turbines. The anticipated visual impact resulting from this infrastructure is likely to be of moderate significance both before and after mitigation.	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **NO IMPACT**	*None are available.*	**MODERATE -** **MODERATE -** **NO IMPACT**
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON THE VISUAL CHARACTER OF THE LANDSCAPE AND SENSE OF PLACE OF THE REGION	Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria and specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, etc.) play a significant role. A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **NO IMPACT**	*Maintain the general appearance of the facility as a whole.* *Monitor rehabilitated areas, and implement remedial action as and when required.*	**HIGH -** **HIGH -** **NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	or less positive light. In general, the landscape character of the greater study area and site itself presents as rural in character. The visual quality of the region is generally high with tracts of intact vegetation, numerous perennial rivers and dams, as well as, mountainous vistas characterising most of the visual environment. As such, the entire study area is considered sensitive to visual impacts due to its generally low levels of transformation. The key visual experience is linked to the use of the road network and associated views of the surrounding landscape. The anticipated visual impact on the visual character and sense of place of the study area is expected to be of high significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates the assessment of this anticipated impact.				
POTENTIAL CUMULATIVE VISUAL IMPACT OF WIND ENERGY FACILITIES WITHIN THE REGION	It is a requirement that a visual specialist identify and quantify the cumulative visual impacts of a proposed development, propose potential mitigating measures, and conclude if the proposed development will result in any acceptable loss of visual resources taking into consideration the other proposed and operational projects in the area. A cumulative visual impact can be defined as the combined or incremental effects resulting from changes caused by a proposed development in conjunction with other existing or proposed activities. The cumulative impact assessed in the table below will consist of the combined impact of the proposed Ngxwabangu WEF and the authorised Ncora WEF, as well as, the Thomas WEF & PV. Cumulative visual impacts may be experienced as a result of where a combination of several WEF's turbines is within a receptors line	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **NO IMPACT**	• *None are available.*	**HIGH -** **HIGH -** **NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	of sight at the same time, where the receptor has to turn their head to see several of the WTGs of the different WEF's or when the receptor has to move from one viewpoint to another to either see different developments or different views of the same development (such as when travelling along a road). The cumulative visual impact is not just the totality of the impacts of two developments. The combined impact may be greater than the sum of the two individual developments, or in rare cases even less. The cumulative visual impact is assessed as the product of the distance between the individual WEFs (or WTG), the total distance over which the WTG are visible, the general character of the landscape and its sensitivity to that specific typology of development, the location and design of the WEFs themselves and lastly the way in which the landscape is experienced by the sensitive receptors. The table below illustrates the assessment of the anticipated cumulative visual impact of infrastructure on sensitive visual receptors within the region. The cumulative visual impacts are likely to be of high significance when the proposed Ngxwabangu WEF is taken into consideration with the other authorised Renewable Energy Facilities within the study area.				
DECOMMISSIONING PHASE ****DUE TO THE FACT THAT NO WIND ENERGY FACILITY'S HAVE BEEN DECOMMISSIONED IN SOUTH AFRICA, CES BELIEVES IT RESPONSIBLE TO STIPULATE THAT FUTHER ASSESSMENT IN THE FORM OF A DECOMISSIONING ENVIRONMENTAL MANAGEMENT PROGRAMME BE DRAFTED, IN CONSULTATION WITH SPECIALISTS, WHEN THIS PHASE BECOMES RELEVANT.**					
AQUATIC IMPACT ASSESSMENT					
The aquatic impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
AVIFAUNAL IMPACT ASSESSMENT					
The avifaunal impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and					

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
implemented to reduce potential adverse impacts.					
BAT IMPACT ASSESSMENT					
The bat impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
ECOLOGICAL IMPACT ASSESSMENT					
The ecological impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
HERITAGE IMPACT ASSESSMENT					
None identified by specialist					
NOISE IMPACT ASSESSMENT					
The noise impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
PALAEONTOLOGICAL IMPACT ASSESSMENT					
None identified by specialist					
SOCIAL IMPACT ASSESSMENT					
The socio-economic impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
VISUAL IMPACT ASSESSMENT					
The visual impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					

9.4 Summary of Findings and Comparative Assessment of Impacts

This section includes summaries of each impact category, including the direct/indirect and cumulative impacts. No-go impacts have not been totalled in this section as they relate to the status quo and have been summarised in the full impact tables available in Section 9.2 and Section 9.3 of this report, as well as Appendix C.

9.4.1 General Impacts

A total of 49 impacts (direct/indirection and cumulative) were identified during the general impact assessment process.

- Negative impacts: the majority of these impacts are MODERATE pre-mitigation and LOW post-mitigation.
- Positive impacts: two (2) HIGH and two (2) LOW impacts were identified. All four (4) remain unchanged post-mitigation.

POST-MITIGATION:

- **0** x negative **HIGH**
- **0** x negative **VERY HIGH**
- **1** x positive **HIGH**
- **0** x positive **VERY HIGH**

Table 9-6: General Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	5	0	5	0	3	0	0	0	13	0	0	0	0	0	0	0
Construction	7	0	7	0	4	0	0	0	16	0	2	0	0	0	0	0
Operations	0	0	4	0	1	2	0	0	4	0	1	0	0	2	0	0
Decommissioning	5	2	4	0	0	0	0	0	9	2	0	0	0	0	0	0
TOTAL	**17**	**2**	**20**	**0**	**8**	**2**	**0**	**0**	**42**	**2**	**3**	**0**	**0**	**2**	**0**	**0**

9.4.2 Aquatic Impact

A total of 5 (five) impacts (direct/indirection and cumulative) were identified during the aquatic impact assessment process.

- Negative impacts: the majority of these impacts are MODERATE pre-mitigation and LOW post-mitigation.
- Positive impacts: no positive impacts were identified.

POST-MITIGATION:

- **0** x negative **HIGH**
- **0** x negative **VERY HIGH**
- **0** x positive **HIGH**
- **0** x positive **VERY HIGH**

Table 9-7: Aquatic Potential Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+

Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	1	0	4	0	0	0	0	0	5	0	0	0	0	0	0	0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**1**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.3 AVIFAUNAL IMPACT

A total of 9 (nine) impacts (direct/indirection and cumulative) were identified during the avifaunal impact assessment process.

- Negative impacts: the majority of these impacts are MODERATE pre-mitigation and LOW post-mitigation.
- Positive impacts: no positive impacts were identified.

POST-MITIGATION:

- **1** x negative **HIGH**
- **0** x negative **VERY HIGH**
- **0** x positive **HIGH**
- **0** x positive **VERY HIGH**

Table 9-8: Avifaunal Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	**-**	**+**	**-**	**+**	**-**	**+**	**-**	**+**	**-**	**+**	**-**	**+**	**-**	**+**	**-**	**+**
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	4	0	0	0	0	0	1	0	3	0	0	0	0	0
Operations	2	0	2	0	0	0	1	0	4	0	0	0	1	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**2**	**0**	**6**	**0**	**0**	**0**	**1**	**0**	**5**	**0**	**3**	**0**	**1**	**0**	**0**	**0**

9.4.4 BAT IMPACT

A total of 7 (seven) impacts (direct/indirection and cumulative) were identified during the bat impact assessment process.

- Negative impacts: the majority of these impacts are MODERATE pre-mitigation and LOW post-mitigation.
- Positive impacts: no positive impacts were identified.

POST-MITIGATION:

- **0** x negative **HIGH**
- **0** x negative **VERY HIGH**
- **0** x positive **HIGH**
- **0** x positive **VERY HIGH**

Table 9-9: Bat Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	**-**	**+**	**-**	**+**	**-**	**+**	**-**	**+**	**-**	**+**	**-**	**+**	**-**	**+**	**-**	**+**
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	2	0	1	0	1	0	0	0	3	0	1	0	0	0	0	0
Operations	0	0	1	0	0	0	1	0	1	0	1	0	2	0	0	0
Decommissioning	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0
TOTAL	**2**	**0**	**3**	**0**	**1**	**0**	**1**	**0**	**4**	**0**	**3**	**0**	**2**	**0**	**0**	**0**

9.4.5 Ecological Impact

A total of 32 impacts (direct/indirection and cumulative) were identified during the ecological impact assessment process.

- Negative impacts: the majority of these impacts are MODERATE pre-mitigation and LOW post-mitigation.
- Positive impacts: no positive impacts were identified.

POST-MITIGATION:

- **0** x negative **HIGH**
- **0** x negative **VERY HIGH**
- **0** x positive **HIGH**
- **0** x positive **VERY HIGH**

Table 9-10: Ecological Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	5	0	15	0	6	0	0	0	22	0	4	0	0	0	0	0
Operations	0	0	6	0	0	0	0	0	2	0	4	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**5**	**0**	**21**	**0**	**6**	**0**	**0**	**0**	**24**	**0**	**8**	**0**	**0**	**0**	**0**	**0**

9.4.6 Heritage Impact

A total of eight (8) impacts (direct/indirection and cumulative) were identified during the heritage impact assessment process.

- Negative impacts: the majority of these impacts are LOW pre-mitigation and LOW post-mitigation.
- Positive impacts: no positive impacts were identified.

POST-MITIGATION:

- **0** x negative **HIGH**
- **0** x negative **VERY HIGH**
- **0** x positive **HIGH**
- **0** x positive **VERY HIGH**

Table 9-11: Heritage Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	6	0	0	0	2	0	0	0	8	0	0	0	0	0	0	0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**6**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.7 Noise Impact

A total of six (6) impacts (direct/indirection and cumulative) were identified during the noise impact assessment process.

- Negative impacts: the majority of these impacts are MODERATE pre-mitigation and LOW post-mitigation.

- Positive impacts: no positive impacts were identified.

POST-MITIGATION:

- **0** x negative **HIGH**
- **0** x negative **VERY HIGH**
- **0** x positive **HIGH**
- **0** x positive **VERY HIGH**

Table 9-12: Noise Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	3	0	1	0	0	0	0	0	4	0	0	0	0	0	0	0
Operations	0	0	1	0	1	0	0	0	2	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**3**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.8 Palaeontology Impact

No paleontological impacts were identified by the specialist. The National Screening Tool indicate that the site was of HIGH sensitivity, however, when the specialist undertook the site visit the site was found to be of LOW to NEGLIGIBLE sensitivity. Thus, no impacts are relevant to this theme.

POST-MITIGATION:

- **0** x negative **HIGH**
- **0** x negative **VERY HIGH**
- **0** x positive **HIGH**
- **0** x positive **VERY HIGH**

Table 9-13: Palaeontology Impact Summary.

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.4.9 Socio-Economic Impact

A total of 32 impacts (direct/indirection and cumulative) were identified during the socio-economic impact assessment process.

- Negative impacts: the majority of these impacts are LOW pre-mitigation and LOW post-mitigation.
- Positive impacts: the majority of these impacts are VERY HIGH pre-mitigation and VERY HIGH post-mitigation.

POST-MITIGATION:

- **0** x negative **HIGH**
- **0** x negative **VERY HIGH**
- **0** x positive **HIGH**

- **18** x positive **VERY HIGH**

Table 9-14: Social Impact Summary

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	8	0	0	0	0	0	0	10	8	0	0	0	0	0	0	10
Operations	2	4	0	4	0	0	0	4	2	0	0	4	0	0	0	8
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**10**	**4**	**0**	**4**	**0**	**0**	**0**	**14**	**10**	**0**	**0**	**4**	**0**	**0**	**0**	**18**

9.4.10 VISUAL IMPACT

A total of 20 impacts (direct/indirection and cumulative) were identified during the socio-economic impact assessment process.

- Negative impacts: the majority of these impacts are HIGH pre-mitigation and MODERATE post-mitigation.
- Positive impacts: no positive impacts were identified.

POST-MITIGATION:

- **7** x negative **HIGH**
- **2** x negative **VERY HIGH**
- **0** x positive **HIGH**
- **0** x positive **VERY HIGH**

Table 9-15: Visual Impact Summary

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	0	0	2	0	0	0	0	0	1	0	1	0	0	0
Operations	2	0	4	0	10	0	2	0	2	0	8	0	6	0	2	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
TOTAL	**2**	**0**	**4**	**0**	**12**	**0**	**2**	**0**	**2**	**0**	**9**	**0**	**7**	**0**	**2**	**0**

9.4.11 NO-GO ALTERNATIVE

There are a number of current environmental impacts which are taking place on the proposed site. These impacts relate to alien vegetation, poaching and erosion. The no-go alternatives of the remainder of the impacts mean that the site and its surrounding remain as is (status quo). This means that the negative impacts associated with the development of the Ngxwabangu WEF would not transpire and nor would the positive impacts. However, the no-go impacts would still be present and the significance of some of the adverse impacts, such as the growth of alien vegetation, could increase.

10 BIODIVERSITY OFFSET STRATEGY

The following chapter outlines the process followed as per the Biodiversity Offset Strategy (Appendix E of the BAR). It is imperative to note that the Biodiversity Offset Strategy has been proposed by an Offset Strategy Specialist and the Avifaunal Specialist. The Strategy is in draft form and relies on active and participatory engagement from Stakeholders. CES strongly recommends that the following Stakeholders actively engage in the PPP. In addition to the notifications sent to all Stakeholders and I&APs, the following parties will receive an additional notice stressing the need for their participation:

- National Department of Forestry, Fisheries and the Environment (DFFE);
- National Department of Forestry, Fisheries and the Environment (DFFE): Biodiversity Conservation;
- Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT);
- Eastern Cape Provincial Tourism Agency (ECPTA);
- Endangered Wildlife Trust (EWT);
- Eskom: Environmental Management Division;
- BirdLife South Africa; and
- Vulpro.

The Ecological Impact Assessment identified the need for a Biodiversity Offset in accordance with the ECBCP (2019), which requires that an offset be designed and implemented when a loss of CBA is being considered. A section of the Ngxwabangu WEF site is located in an area which is classified CBA 1. The key biodiversity feature driving the CBA classification of the area is the Cape Vulture (*Gyps coprotheres*). For this reason, the Biodiversity Offset has focussed on this species (Please see Appendix E).

In addition, the most recent Guideline for Biodiversity Offsets in South Africa (Draft for public review, 2022) states that where residual impacts on threatened biodiversity is MODERATE or higher, a Biodiversity Offset needs to be implemented. This is the case for the impact of bird collision with the proposed wind turbines.

The purpose of the Biodiversity Offset Strategy is to design a draft biodiversity offset/trade-off plan. The biodiversity offset/trade-off plan has been developed by undertaking the following:

1. Assessing the alignment of the project with the principles of offsetting/trade-offs;
2. Describing the method of calculating the residual negative impact that needs to be offset/traded-off;
3. Describing the offset and trade-off options;
4. Calculating the offset/trade-off;
5. Outlining the necessary steps for implementation; and
6. Outlining monitoring requirements for adaptive calculations.

This Draft Offset/trade-off plan explores an option for an offset (directly linked to specific activities) or a trade-off (indirect approach linked to the funding of a conservation programme). Kindly refer the Appendix E for the full draft Biodiversity Offset Strategy.

The Biodiversity Offset Strategy, in its current draft form, concludes the following:

The biodiversity offset plan will be implemented in year 1 of operations as per the selected option (to be discussed with relevant stakeholders) regardless of actual fatalities.

- Once the wind farm is operational, the actual impacts on vultures will be measured for the project lifespan. The whole site will need to be monitored in line with best practice guidance for fatalities by an external specialist, as stated in the avifaunal impact assessment report (Avifaunal Impact Assessment, Ngxwabangu WEF and OHL).

- The actual fatality data will be used to make corrections to the offset/trade-off calculation from year 6, every 5 years.
- The implementation, results, and monitoring of the offset programme will be reported on in the wind farm operational bird monitoring reports. These will be submitted to the DFFE, DEDEAT, EWT, and BirdLife South Africa.
- The biodiversity offset agreement will be a condition of the EA, and the offset plan will form part of the EMPr.
- An independent auditor, appointed by the EA holder, will undertake audits on the implementation of the biodiversity offset at intervals that may be prescribed in the EA.
- The duration of the biodiversity offset will be linked to the lifespan of the wind farm, i.e. 25 years.
- If the implementation of the biodiversity offset does not meet the requirements specified in the offset plan, this will constitute a non-compliance with the EA.

11 SENSITIVITY ANALYSIS

A site development sensitivity map (Figure 11-1) was developed based on specialist and general site information gathered, and the site was classified into areas of low and conditional sensitivity and **NO-GO** no development).

- **NO-GO** areas included areas of high sensitivity indicated by the bird and bat specialists, identified heritage sites, forest patches, delineated wetlands, rocky outcrops and buffers around existing infrastructure (including a 500m buffer around all noise sensitive areas).
- **Conditional Sensitivity** areas are areas where construction is conditional on the fulfilment of one or another aspect-specific requirement. For example, all construction in the Heritage conditional sensitivity areas will require sign-off by a palaeontologist to ensure that no fossils (if found) are damaged or destroyed. Other conditional sensitivity areas include areas of moderate sensitivity identified by the bird and bat specialist and ecologically sensitive areas such as watercourses, wetlands, and thicket vegetation.
- **Low Sensitivity** areas are areas where construction may take place without hindrance.

The main objective of the sensitivity analysis is to guide development away from sensitive areas and have development footprints located in areas of lower sensitivity. We have previously used the terms go area; go-but area; and no-go area.

The limitation of the above is that a no-go area is just that – one cannot ever do anything in this area, because it is **no-go.** But in certain cases, development is required. A road crossing over a stream, or some other linear infrastructure, which can be developed, provided there is sound mitigation and other constraints are applied. So, it is not no-go but developmentally constrained.

It is, therefore, preferable to use and map the following categories:
LOW CONSTRAINT/NONE IDENTIFIED - These areas can be easily developed, as there are only minor constraints, and little mitigation and management is required (aside from normal building design and construction restrictions outlined in the EMPr).
LOW-MODERATE CONSTRAINT – These areas can be developed but require mitigation and management as per the general management conditions of the EMPr.
MODERATE CONSTRAINT - These areas can accommodate development, but there are constraints. Mitigation and management will be required to reduce significant environmental impacts to acceptable levels, and appropriate technology (sewage, waste etc.) and design will be required to reduce impacts and ensure sustainability. Sound arguments as to why the development cannot be located in less sensitive areas will be required to justify locating development in moderately constrained areas.
MODERATE-HIGH CONSTRAINT – These areas can accommodate development, but there are strict constraints. Mitigation and management will be required to reduce significant environmental impacts to acceptable levels. Sound arguments as to why the development cannot be located in less sensitive areas will be required to justify locating development in moderate-high constrained areas.
HIGH CONSTRAINT - If development takes place in these areas, considerable effort (and most likely expense) will be required to design out, mitigate or manage negative environmental impacts. In many cases this will not be possible and in general no development should take place in these areas. Only facilities that are location dependent should be permitted in these areas. For example, a road crossing a sensitive riparian area, or a mine pit that must be located where the resources are.
NO-GO CONSTRAINT – These include areas included areas of high sensitivity indicated by the bird and bat specialists (specific to turbines, rather than roads), identified heritage sites and buffers around existing infrastructure (including a 500m buffer around all noise sensitive areas).

The proposed draft Ngxwabangu WEF turbine layout avoided all **NO-GO (VERY HIGH)** areas identified by the various specialists, layout and EMPr finalisation will be required, inclusive of ground truthing by botanical,

avifaunal and heritage specialists, prior to finalisation. Figure 11-1 overlays all sensitive areas identified by these specialists. The following sensitivities are relevant to the proposed WEF site:

- All specialist constraints (including **NO-GO**, **HIGH**, **MODERATE-HIGH**, **LOW-MODERATE** and **LOW/NONE)**
- Updated ECBCP (2019) Terrestrial:
  - CBA 1 **HIGH**
  - CBA 2 **MODERATE-HIGH**
  - ESAs **LOW-MODERATE**
- Updated ECBCP (2019) Aquatic:
  - CBA 1 **HIGH**
  - CBA 2 **MODERATE-HIGH**
  - ESAs **LOW-MODERATE**)
- NBA (2018) Threatened Ecosystems:
  - Critical **NO-GO**
  - Endangered **HIGH**
  - Vulnerable **MODERATE-HIGH**
- NPAES (2011)
  - Focus Areas **MODERATE-HIGH**
- NBA (2018) and NFEPA (2011/14) Wetlands **HIGH**
  - Wetlands 500m buffer **MODERATE**
- Rivers and drainage lines **HIGH**
  - River 100m Buffer **MODERATE**

Table 11-1: Turbine Sensitivities

TURBINE NUMBER	50 TURBINE LAYOUT (ALTERNATIVE 1)	36 TURBINE LAYOUT (ALTERNATIVE 2)	COMMENT (ALTERNATIVE 2 IS THE PREFERRED ALTERNATIVE)
WTG 01	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 02	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 03	MODERATE TO HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 04	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 05	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 06	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 07	HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 08	HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 09	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 10	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 11	VERY HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 12	VERY HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 13	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 14	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 15	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 16	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 17	VERY HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 18	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 19	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 20	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 21	HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 22	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 23	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 24	VERY HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 25	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 26	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 27	VERY HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 28	VERY HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION

WTG 29	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 30	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 31	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 32	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 33	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 34	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 35	VERY HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 36	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 37	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 38	VERY HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 39	VERY HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 40	MODERATE TO HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 41	MODERATE TO HIGH	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 42	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 43	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 44	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 45	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION
WTG 46	MODERATE TO HIGH	MODERATE	TURBINE MOVED, ACCEPTABLE, WITH MITIGATION
WTG 47	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 48	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 49	MODERATE	TURBINE REMOVED	TURBINE REMOVED FROM LAYOUT
WTG 50	MODERATE	MODERATE	ACCEPTABLE, WITH MITIGATION

SUMMARY	50 TURBINE LAYOUT (ALTERNATIVE 1)	36 TURBINE LAYOUT (ALTERNATIVE 2)	
NO-GO/VERY HIGH	9 TURBINES	0 TURBINES	
HIGH SENSITIVITY	3 TURBINES	0 TURBINES	
HIGH/MODERATE SENSITIVITY	11 TURBINES	0 TURBINES	
MODERATE SENSITIVITY	27 TURBINES	36 TURBINES	
LOW/MODERATE SENSITIVITY	0 TURBINES	0 TURBINES	
LOW/NO IDENTIFIED SENSITIVITY	0 TURBINES	0 TURBINES	

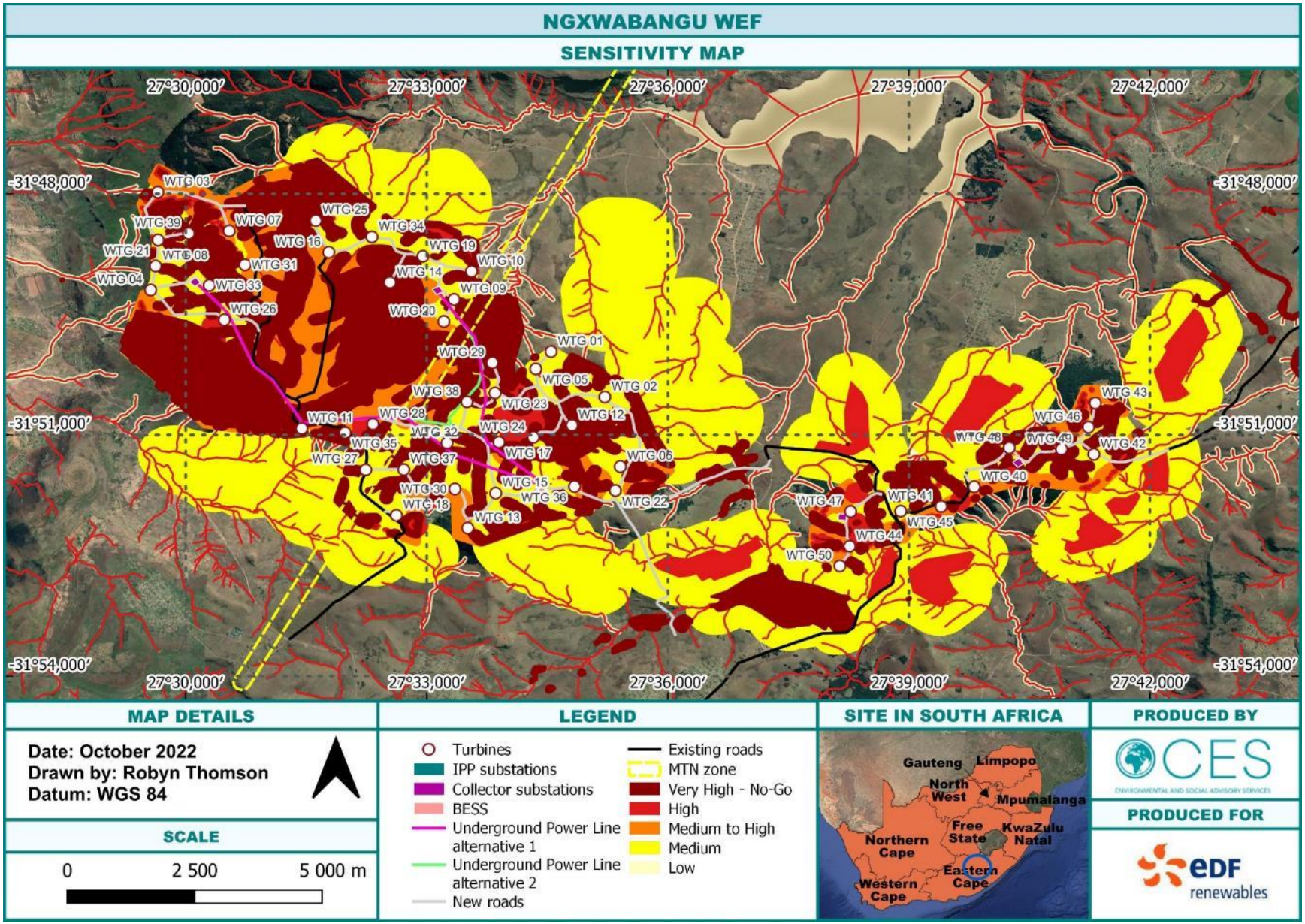

Figure 11-1: Ngxwabangu WEF Site Sensitivity: 50-Turbine Layout (previously proposed layout, Alternative 1)

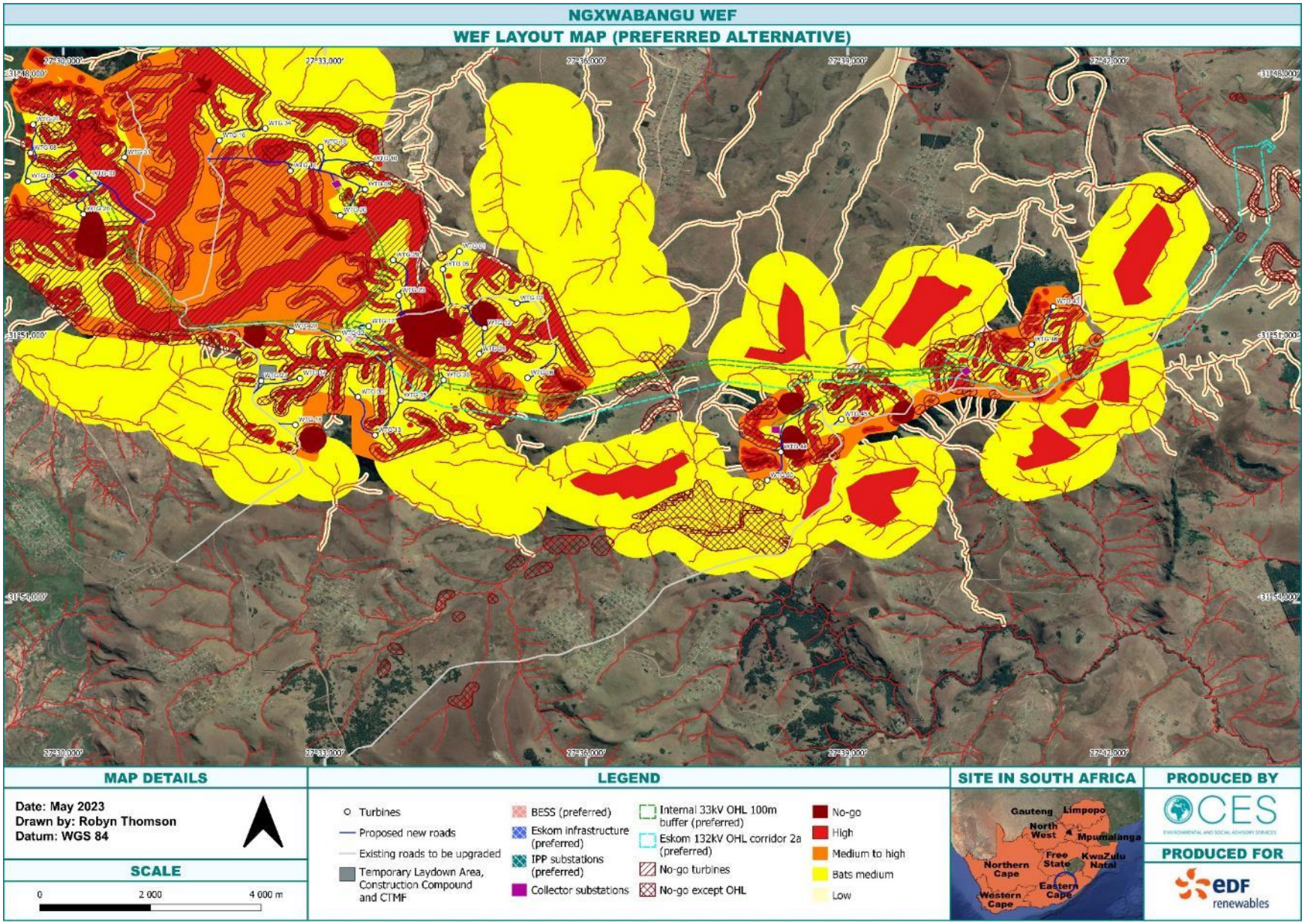

Figure 11-2: Ngxwabangu WEF Site Sensitivity: 36-Turbine Layout (preferred layout, Alternative 2)

12 PUBLIC PARTICIPATION

12.1 ACTIVITY ON LAND OWNED BY A PERSON OTHER THAN THE APPLICANT

In accordance with Section 39 (1), stipulated in Chapter 6 of the NEMA EIA Regulations (2014, as amended), which states that "*If the proponent [Applicant] is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land*." EDF Renewables (Pty) Ltd, on behalf of their subsidiary Ngxwabangu Wind Power (Pty) Ltd, has engaged with the landowners regarding the proposed activities on the proposed properties. In addition to this, land agreements are in place and consent has been obtained to conduct the various studies required to implement the proposed Ngxwabangu WEF.

12.2 OBJECTIVES OF THE PPP

In accordance with Section 40 (1), stipulated in Chapter 6 of the NEMA EIA Regulations (2014, as amended), the purpose of public participation is to provide all potential or registered I&APs, including the Competent Authority, with the opportunity to access the relevant documents and information which could reasonably or potentially influence any decision with regards to the proposed Ngxwabangu WEF Application for EA. The process aims to –

- Disclose activities planned by the Applicant and steps in the BA Process by the environmental team;
- Identify concerns and grievances raised by the I&APs;
- Respond to all the I&APs grievances and enquiries;
- Identify local expertise, needs and knowledge from the I&APs;
- Identify additional or new stakeholders and people affected by, or interested in, the proposed project;
- Gather perceptions and comments on the specialist studies;
- Ensure that all issues raised by I&APs have been adequately addressed and/or assessed; and
- Share the findings of the BA Process, such as significant impacts, mitigation measures, management actions, and monitoring programmes.

The PPP must include consultation with the following key members –

- The Competent Authority: National DFFE;
- All state departments which have laws relating to the proposed activity or the proposed location of the activity (e.g. Department of Water and Sanitation);
- All biodiversity stakeholders which have an interest in the site, including BirdLife SA, Vulpro, EWT, DFFE Biodiversity and Conservation and Protected Areas Directorates, among others;
- The affected landowners and surrounding landowners;
- All organs of the state which have jurisdiction relating to the proposed activity or the proposed location of the activity; and
- The registered and potential I&APs.

12.3 LEGISLATIVE REQUIREMENTS

In accordance with Section 41 (2) of Chapter 6, the person conducting the PPP must provide notice using the following methods –

a) Placing a notice board/(s) at a visible location, which is accessible to the public, on the boundary of the affected properties and within proximity to the affected properties [please see Appendix H for photographs and coordinates of the onsite signage]. The notice board/(s) must –

- Be at least 60 cm x 42 cm in size;
- Specify whether a Basic Assessment Process or Scoping and EIA Process is triggered by the proposed activity;
- Indicate the nature and location of the activity to which the application relates;
- Explain where further information can be obtained; and
- Stipulate the manner in which and the person to whom correspondence relating to the application or proposed application may be made.

b) Providing written notice to [please see proof included as Appendix H] –

- The owner and/or occupiers of the proposed site as well as the owner(s) and/or occupiers of the alternative sites;
- The owners and/or occupiers of the land adjacent to the site as well as the owners and/or occupiers of the land adjacent to the alternative sites;
- The municipal ward councillor of the affected property and the alternative sites (if different to the preferred alternative) as well as any organisation of ratepayers that represent the community in the affected area;
- The municipality which has jurisdiction in the area;
- All organs of the state which have jurisdiction relating to the proposed activity or the proposed location of the activity; and
- Any other parties as required by the Competent Authority.

c) Placing an advertisement in one (1) local newspaper and/or any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations [please see Appendix H for proof of advertisement];

d) If necessary, placing an advertisement in one (1) provincial newspaper or national newspaper if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken (***not applicable***); and

e) Using reasonable alternative methods, as agreed to by the Competent Authority, in those instances where a person is interested but not able to participate in the process due to illiteracy, disability or any other disadvantage.

12.4 Notification of Interested and Affected Parties

Public consultation is a legal requirement throughout the BA Process. Developers, or the appointed independent EAP, are required to conduct public consultation throughout the BA Process. Formal BA documents are required to be made available for public review and comment by the proponent [or the EAP on behalf of the Applicant], these include the Basic Assessment Report, EMPrs and Specialist Reports. The method of public consultation to be used depends largely on the location of the development and the affected parties. Required means of public consultation include:

- Site notice(s);
- Newspaper advertisement(s);
- Community interviews and focus group meetings;
- Letter of Notification and information to affected landowner(s), stakeholders and registered I&APs (Proof: e-mail, registered letters to DFFE);

- Public meeting (Attendance register and meeting minutes); and
- Authority and Stakeholder engagement (DFFE, DWS, SAHRA, DEDEAT, etc.).

Please note that all proof of public notification has been attached as APPENDIX H. The previously received correspondence from Stakeholders and I&APs will be included as part of the final issues and response trail once this application's PPP has been concluded.

12.4.1 NEWSPAPER ADVERTISEMENT

- Daily Dispatch Adverts, 1 x English and 1 x isiXhosa (published on the 14th of November 2022): See APPENDIX H.

12.4.2 ONSITE NOTICES

- Four (4) onsite notice boards have been erected, in both English and isiXhosa: See APPENDIX H.

12.4.3 INTERESTED AND AFFECTED PARTIES (I&APS) IDENTIFICATION AND NOTIFICATION

In addition to the above notification, certain I&APs were identified based on their potential interest in the project. In Table 12-1, relevant organisations are contacted either via e-mail or SMS. In addition, surrounding landowners and additional I&APs were identified and notified based on an extensive site visit during which the project was introduced to the community through focus group meetings. This database will be updated throughout the process, inclusive of community meetings to be held in November/December 2022.

Table 12-1: Stakeholder and Organisational Database

REGISTERED STAKEHOLDERS		
STAKEHOLDER	**CONTACT PERSON**	**CONTACT DETAILS**
Department of Forestry, Fisheries and the Environment (DFFE)	Mohammad Essop	[redacted]
	Thobani Vetsheza (prev. DAFF)	[redacted]
	Zamalanga Langa	[redacted]
DFFE: Biodiversity & Conservation	Portia Makitla	[redacted]
	BC Admin	[redacted]
Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) (Chris Hani)	Mcedisi Makosonke	[redacted]
Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) (Head Office)	Siyabonga Gqalangile	[redacted]
Department of Water and Sanitation (DWS) (East London and Bloemfontein)	Lizna Fourie	[redacted]
	Pius Lerotholi	[redacted]
Department of Mineral Resources and Energy (East London)	Letshego Mabena	[redacted]
Eskom: Renewable Energy	John Geeringh	[redacted]
Eskom: Land & Rights Section	Michelle Nicol	[redacted]
Chris Hani District Municipality	Gcobani Mashiyi	[redacted]
	Mxolisi Koyo	[redacted]
	Moppo Mene	[redacted]
	Boitumelo Koloi	[redacted]
	Nonelela Gobeni	[redacted]
Intsika Yethu Local Municipality	*Office*	[redacted]
	Dr B.J. Mthembu	[redacted]

REGISTERED STAKEHOLDERS		
STAKEHOLDER	CONTACT PERSON	CONTACT DETAILS
	Zamxolo Shasha	
	Koliswa Vimbayo	
	Jongumuzi Cengani	
Intsika Yethu Ward 5	Cllr. Yamile	
Intsika Yethu Ward 16	Cllr. Mto	
Intsika Yethu Ward 18	Cllr. Makade	
Intsika Yethu Ward 19	Cllr. Yamile	
Intsika Yethu Ward 20	Cllr. Ludaka	
Intsika Yethu Ward 21	Cllr. Mgqamqho	
SALGA Eastern Cape	Tebogo Mosala	
	Seana Nkhahle	
Eastern Cape Department of Human Settlements	Zanele Langa	
Department of Agriculture, Land Reform and Rural Development	Thabile Mehlomakhulu	
Eastern Cape Provincial Heritage Resources Authority (ECPHRA)	Lennox Zote	
	Sello Mokhanya	
South African Heritage Resources Agency (SAHRA)	Natasha Higgitt	
	Dumisani Sibayi	
Eastern Cape Parks and Tourism Agency (ECPTA)	Vuyani Dayimani	
	Lovinia Shaw	
Telkom	Raymond Couch	
Sentech	Alishea Viljoen	
Vodacom	Andre Barnard	
MTN	Krishna Chetty	
Cell C	Hugo Dippenaar	
	Rudi Liebenberg	
Civil Aviation Authority (CAA)	Lizelle Stroh	
Air Traffic and Navigation Services (ATNS)	Percy Morokane	
	Carol Thomas	
Eastern Cape Department of Roads and Public Works	Thandolwethu Manda	
	Randall Moore	
South African National Roads Agency (SANRAL) - Southern Region	Danfred Adams	
BirdLife South Africa: Birds and Renewable Energy Project Manager	Samantha Ralston-Paton	
Endangered Wildlife Trust: Head of Conservation Science	Harriet Davies-Mostert	
Endangered Wildlife Trust: Wildlife & Energy Programme	Lourens Leeuwner	
VulPro	Kerri Wolter	

12.4.4 *SURROUNDING AND AFFECTED LANDOWNERS*

The residents of the surrounding areas were provided with an initial letter of introduction to the project during the site meetings. This process also registered the affected individuals on the Stakeholder and I&AP database. The majority of contacts for this project are via SMS.

12.4.5 REGISTERED I&APS

Other than I&APs initially identified and any persons requesting to be registered as I&APs have been and will continue to be included in the I&AP database (Appendix H).

12.4.6 PUBLIC MEETINGS

This section will be updated with the outcomes of the community meetings which will be held during the months of November and December 2022. This will include meeting minutes, meeting presentations and updated I&AP database.

12.4.7 THE PUBLIC PARTICIPATION PROCESS TO BE FOLLOWED:

The public participation process followed and to be followed includes:

- Release of the Draft Basic Assessment Report for Authority, Stakeholder and Public review.
- The pervious Draft Basic Assessment Report (DFFE Ref. 14/12/16/3/3/1/2674) was made available for public review from the 14th of November 2022 to 14th of December 2022 (30 days). The current Draft BAR (DFFE Ref. TBC) will be made available for public review from 18th of May 2023 to 19th June 2023 (30 days).
  - **(a)** Hard copies of the Draft Basic Assessment Report were (previous) and will be (current) made available in Komani and Cofimvaba
  - **(b)** Electronic copies were (previous) and will be (current) made available on the CES website (www.cesnet.co.za)
- Community engagement meetings were held during November/December 2022.

12.5 COMMENTS AND RESPONSE REPORT

The Comments and Response Report (CRR) can be found in Appendix I of this document as a separate standalone chapter. The CRR includes all issues raised and the EAP, specialist and/or Applicant responses to these issues. These tables will be updated throughout the process from inception until submission of the Final BAR to the Competent Authority (DFFE).

13 CONCLUSION AND RECOMMENDATIONS

13.1 DESCRIPTION OF THE PROPOSED ACTIVITY

Ngxwabangu Wind Power (Pty) Ltd., a subsidiary of EDF Renewables South Africa (Pty) Ltd. plans to develop, construct and operate a WEF approximately 15 km North of Cofimvaba in the Eastern Cape Province. The project site is situated in the Intsika Yethu LM which forms part of the Chris Hani DM. The proposed Ngxwabangu WEF is situated within the Stormberg REDZ (REDZ4) which was promulgated in GN R. 840 for large scale wind and solar photovoltaic energy facilities. According to the data recorded by the applicant in the area as well as the WASA (Wind Atlas for South Africa, CSIR, 2018) this project site appears to have favourable wind conditions to operate a wind farm.

The proposed Ngxwabangu WEF will consist of up to 36 turbines, with a total facility output of up to 260MW. The WEF will also include up to four (4) 33kV medium voltage internal collector substations, two (2) 33kV medium voltage underground powerlines of up to 6km and 9km in length (two alternatives), a 33 kV medium voltage OHL of approximately 12km to connect the northern section to the southern section of the site, an IPP Substation (two alternatives) which will include a 33kV/132kV Switching Station (SWS) area in order to connect the WEF to the existing Eskom Substation via a 132kV OHL (two alternatives). The WEF will also include a BESS (two alternatives), temporary and permanent laydown areas, a CTMF, a Construction Compound (CC), and access roads. The construction footprint of the proposed WEF will be up to 209 ha (inclusive of roads), rehabilitated to an operational footprint of up to 118 ha (inclusive of roads).

13.2 NEED AND DESIRABILITY

The need to reduce GHG emissions and the importance of a secure and diversified energy supply has resulted in a national shift towards the use of renewable energy technologies. In support of this, the national and provincial government has encouraged the utilisation of renewable energy through policy and strategic planning. The proposed Ngxwabangu WEF can contribute towards these national and provincial goals by adding approximately 260MW to the policy targets. The Eastern Cape has traditionally been isolated in its energy supply, relying on Eskom's distribution network to carry energy from the northern coal-fired power plants to the region. The proposed Ngxwabangu WEF would assist in stabilising the local (Intsika Yethu LM) and provincial (Eastern Cape) grid network, leading to a more stable and long-term solution to the energy requirements of the region.

13.3 ASSUMPTIONS, LIMITATIONS AND GAPS IN KNOWLEDGE

This report is based on currently available information and, as a result, the following limitations and assumptions are implicit–

- This report is based on a project description and site plan, provided to CES by the applicant, which has not been approved by DFFE at this stage of the project. The project description and site plan may undergo iterations and refinements before being regarded as final. A project description based on the final design will be concluded once DFFE has provided feedback on the layout provided in this report.
- Descriptions of the natural and social environments are based on limited fieldwork and available literature.

- It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the accompanying maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken.
- The current Biodiversity Offset Plan requires Stakeholder input in order to progress to a finalised version. The intention of the document is to under PPP as part this BA process.

13.4 Environmental Cost-Benefit Analysis

A total of 172 impacts were identified during the BA Process. Of the identified impacts, 142 are NEGATIVE pre-mitigation and 26 are POSITIVE pre-mitigation.

13.4.1 Negative Impacts

34% of the negative impacts are LOW pre-mitigation, 42% are MODERATE pre-mitigation, 21% are HIGH pre-mitigation and 3% are VERY HIGH pre-mitigation significance. Key negative pre-mitigation impacts relate to the following:

- Impact of Cape Vulture collisions with turbines
- Impact of various bat species collisions with turbines
- Impact of shadow flicker on surrounding communities
- Impact of visual intrusion on surrounding communities

75% of the negative impacts are LOW post-mitigation, 19% are MODERATE post-mitigation, 7% are HIGH post-mitigation and 1% are VERY HIGH post-mitigation significance. Key post-mitigation impacts relate to the following:

- Impact of Cape Vulture collisions with turbines
- Impact of shadow flicker on surrounding communities
- Impact of visual intrusion on surrounding communities

13.4.2 Positive Impacts

23% of the positive impacts are LOW pre-mitigation, 15% are MODERATE pre-mitigation, 8% are HIGH pre-mitigation and 54% are VERY HIGH pre-mitigation significance. Key positive pre-mitigation impacts relate to the following:

- Impact of employment opportunities in the province
- Impact of employment opportunities for the local communities
- Impact of skills development and higher education opportunities for the local communities
- Impact of potential economic development initiatives in the local area

8% of the negative impacts are LOW post-mitigation, 15% are MODERATE post-mitigation, 8% are HIGH post-mitigation and 69% are VERY HIGH post-mitigation significance. Key post-mitigation impacts relate to the following:

- Impact of employment opportunities in the province
- Impact of employment opportunities for the local communities
- Impact of skills development and higher education opportunities for the local communities
- Impact of potential economic development initiatives in the local area

Table 13-1: Cost-benefit Analysis

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
GENERAL IMPACTS																

Planning & Design	5	0	5	0	3	0	0	0	13	0	0	0	0	0	0	0
Construction	7	0	7	0	4	0	0	0	16	0	2	0	0	0	0	0
Operations	0	0	4	0	1	2	0	0	4	0	1	0	0	2	0	0
Decommissioning	5	2	4	0	0	0	0	0	9	2	0	0	0	0	0	0
AQUATIC IMPACTS																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	1	0	4	0	0	0	0	0	5	0	0	0	0	0	0	0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AVIFAUNAL IMPACTS																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	4	0	0	0	0	0	1	0	3	0	0	0	0	0
Operations	2	0	2	0	0	0	1	0	4	0	0	0	1	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BAT IMPACTS																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	2	0	1	0	1	0	0	0	3	0	1	0	0	0	0	0
Operations	0	0	1	0	0	0	1	0	1	0	1	0	2	0	0	0
Decommissioning	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0
ECOLOGICAL IMPACTS																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	5	0	15	0	6	0	0	0	22	0	4	0	0	0	0	0
Operations	0	0	6	0	0	0	0	0	2	0	4	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HERITAGE IMPACTS																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	6	0	0	0	2	0	0	0	8	0	0	0	0	0	0	0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NOISE IMPACTS																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	3	0	1	0	0	0	0	0	4	0	0	0	0	0	0	0
Operations	0	0	1	0	1	0	0	0	2	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PALAEONTOLOGICAL IMPACTS																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOCIO-ECONOMIC IMPACTS																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	8	0	0	0	0	0	0	10	8	0	0	0	0	0	0	10
Operations	2	4	0	4	0	0	0	4	2	0	0	4	0	0	0	8
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VISUAL IMPACTS																
Planning & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	0	0	0	2	0	0	0	0	0	1	0	1	0	0	0
Operations	2	0	4	0	10	0	2	0	2	0	8	0	6	0	2	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
TOTAL	**48**	**6**	**60**	**4**	**30**	**2**	**4**	**14**	**107**	**2**	**27**	**4**	**10**	**2**	**2**	**18**

13.4.3 NEGATIVES VS POSITIVES

The key areas of concern for this proposed WEF are related to the potential impact on Cape Vultures, while the key areas of promise for this proposed WEF are related to the potential impact on the socio-economic aspect of the area. The Socio-Economic Impact Assessment has undertaken to ensure that enhancement opportunities are focused on the upliftment of the community while ensuring, where possible, that these initiatives benefit the conservation, awareness, and impact on the Cape Vulture present in this area.

The fact that the proposed WEF is situated within a REDZ did not negate the fact that the avifaunal impacts are likely to be high unless mitigated, but a proposed Biodiversity Offset Strategy has been drafted as part of this process. The avifaunal specialist has undertaken a 24-month monitoring campaign to understand the use of the site by Cape Vultures. In addition to this, the socio-economic specialist and CES PPP consultant have

undertaken extensive site interviews and collaboration with other specialists to ensure that the site is understood from a social, economic and biodiversity perspective. It is with this in mind that the EAP is able to conclude, based on the assessments undertaken, that the significance of the potential positive impacts do exceed the significance of the potential negative impacts of this proposed project, in terms of severity.

13.5 CUMULATIVE IMPACT STATEMENT

There are no operational WEFs in the area. The Ncora WEF was proposed by the same developer and was authorised in 2011. This EA has since lapsed/expired, and the site area has been merged into the Ngxwabangu site. It was therefore not assessed separately. Individual impacts, where relevant, have been assessed from a cumulative perspective.

The cumulative impact of the proposed WEF, considering that no operational WEFs are present within 30km of the site is LOW. In addition, the proposed Ngxwabangu WEF is being proposed within a REDZ and it is assumed that renewable energy facilities within the general area will be proposed at some point in the future.

13.6 FATAL FLAWS

It is the opinion of the EAP, that based on the information gathered during the BA Process, including specialist studies, the impacts described do not represent any fatal flaws regarding the proposed Ngxwabangu WEF. Based on the current revised layout (reduced from 50 turbines to 36 turbines), the current layout does not pose any fatal flaws.

13.7 OPINION OF THE EAP

Based on the contents of this report, and all associated documentation, it is the opinion of the EAP that the proposed Ngxwabangu WEF be authorised on condition that all conditions stipulated in Section 13.8 of this report be contained within the EA. The ecological, economic and social trade-offs must be factored in by the DFFE during the decision-making process. It is the opinion of the EAP that site is sensitive from an avifaunal perspective, suitable from an ecological perspective (remaining highly sensitive areas have been avoided and can be suitably mitigated) and highly desirable from an economic perspective.

It is of critical important that the Draft Biodiversity Offset Strategy be updated prior to the finalisation of the BA process. The need for a Biodiversity Offset Strategy was identified a part of the Ecological Impact Assessment which notes that the CBA1 classification of large parts of the site requires an offset to be considered, as per the ECBCP Handbook. The Draft Biodiversity Offset Strategy was prepared by a Biodiversity Offset Specialist and the Avifaunal Specialist.

13.8 ALTERNATIVES RECOMMENDATIONS

WEF Layout: ALTERNATIVE 2 IS RECOMMENDED

- WEF Layout Alternative 2 is the preferred alternative, it is a reduced and refined layout (50 turbines reduced to 36) based on specialist input and recommendations.
- The proposed turbines will have a hub height of up to 130m, a rotor diameter of up to 170m, blade length of up to 85m, and a maximum tip height of up to 215m and a lower tip height of 30m. These dimensions are also reduced from the size of the turbines proposed as part of Layout Alternative 1 (50 turbine).
- Permanent laydown areas adjacent to each wind turbine (up to 4 000 m^2).

- Temporary laydown areas adjacent to each wind turbine (up to 3 150 m^2).
- Foundations (up to 900 m^2) for each wind turbine.

IPP Substation Alternative: IPP SS ALTERNATIVE 2 IS RECOMMENDED

- IPP Substation Alternative 2 is the preferred alternative, it is situated in the northern area. Is required in terms of the preferred connection point.
- None of the Specialists have flagged any issues related to this alternative, in particular.

BESS Alternative: BESS ALTERNATIVE 1 IS RECOMMENDED

- BESS Alternative 2 is the preferred alternative, it is situated in the northern area. It is required in terms of the preferred connection point.
- None of the Specialists have flagged any issues related to this alternative, in particular.

33kV underground powerline (Collector SS to IPP SS): 33KV POWERLINE ALTERNATIVE 1 IS RECOMMENDED

- 33kV powerline alternative 1 is the preferred alternative, it is situated in the southern section and connects the northern and eastern collector SSs. This is the shorter line route (6km instead of 9km).
- None of the Specialists have flagged any issues related to this alternative, in particular.

33kV overhead powerline (Northern Section to Southern Section): RECOMMENDED (NO ALTERNATIVES PROPOSED)

- There is only one alternative for this OHL. It has been designed based on specialist sensitivities, with their input.
- None of the Specialists have flagged any issues related to this alternative, in particular.

132kV overhead powerline (33/132kV IPP SS to the Eskom Qolweni SS): 132KV OHL ALTERNATIVE 2A IS RECOMMENDED

- Alternative 2a is proposed from the northern IPP Substation (IPP SS Alternative 2 in the WEF BA). This OHL is 132kV and is up to 20km in length. This is the preferred alternative (2a)
- None of the Specialists have flagged any issues related to this alternative, in particular.

Collector Substations (CSS): RECOMMENDED (NO ALTERNATIVES PROPOSED)

- Four (4) Collector Substations (SS) of up 3ha each (33kV). Two (2) of the Collector SSs are situated within the western cluster of turbines and two (2) of the Collector SSs are situated within the eastern cluster of turbines.
- All four CSS are required as part of the preferred layout.
- None of the Specialists have flagged any issues related to this alternative, in particular.

Temporary Laydown Area, Temporary Buffer Yard, Temporary Batching Plant, Temporary CTMF and Temporary Site Camp/Construction Compound: RECOMMENDED (NO ALTERNATIVES PROPOSED)

- There is only one alternative proposed for the temporary infrastructure. Its position is based on proximity to the access road and ease of distribution to all areas of the site from a fairly central region of the site.
- None of the Specialists have flagged any issues related to this alternative, in particular.

33kV underground cabling connection turbines to the 4 CSSs: RECOMMENDED (AS PER THE PREFERRED WEF LAYOUT 2)

- There is one underground cabling layout proposed and this relates to the preferred turbine layout.
- None of the Specialists have flagged any issues related to this alternative, in particular.
- This same layout is linked to the road layout, as discussed in the next point, and has been optimised based on technical location of turbines and environmental sensitivities.

Internal Access Roads 15m wide (construction phase) / 8m wide (operational phase): RECOMMENDED (AS PER THE PREFERRED WEF LAYOUT 2)

- There is one road layout proposed and this relates to the preferred turbine layout.
- None of the Specialists have flagged any issues related to this alternative, in particular.
- This same layout is linked to the underground cabling layout, as discussed in the previous point, and has been optimised based on technical location of turbines and environmental sensitivities.

13.9 RECOMMENDATIONS OF THE EAP

The following recommendations are stressed as per the BAR and associated specialist reports:

- The Biodiversity Offset Strategy must be implemented by the developer (as per the Biodiversity Offset Strategy);
- Social enhancement recommendations must be considered and financially catered for by the developer (as per the SEIA)
- All no-go areas must be avoided (as per the current preferred layout, all no-go areas have been avoided with the except of a section of new road in the Rudd's Lark/Yellow-breasted Pipit area. This will require ground truthing prior to road layout finalisation); and
- The layout and EMPr are subject to a final walk through by an Avifaunal, Heritage and Botanical specialist prior to approval. This process must include PPP in accordance with the NEMA EIA Regulation (2014, as amended).

Section 13.9.1 -13.9.6 includes a comprehensive list of further recommendations, as per the BAR and associated specialist reports, for the various phases of the project.

13.9.1 PLANNING AND DESIGN RECOMMENDATIONS

The following general planning and design phase mitigation actions are recommended:

- Reduce the size of the facility and factor in the additional bat sensitivity recommendations to ensure that turbines avoid all sensitive areas.
- Project planning must include a plan for traffic control that will be implemented, especially during the construction phase of the development. Consultation with the local Road Traffic Unit in this regard must be done early in the planning phase. The necessary road traffic permits must be obtained for transporting parts, containers, materials and construction equipment to the site.
- Careful planning of the routes taken by heavy vehicles must highlight areas of road that may need to be upgraded in order to accommodate these vehicles. Once identified, these areas must be upgraded if necessary.
- All hazardous substances such as paints, diesel and cement must be stored in a bunded area with an impermeable surface beneath them.
- Cement mixing must be conducted at a single location which must be centrally located, where practical. This mixing must take place on an impermeable surface, and dried waste cement must be disposed of with building rubble.
- Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy. These must include (but not restricted to):
    - Local and District Spatial Development Frameworks
    - Local Municipal bylaws
- In addition, planning for the construction and operation of the proposed energy facility must consider available best practice guidelines.
- Turbine and ancillary infrastructure (except roads) must be located at least 32m away from identified drainage lines.

- A Stormwater Management Plan must be designed and implemented to ensure maximum water seepage at the source of water flow. The plan must also include management mitigation measures for water pollution, wastewater management and the management of surface erosion e.g. by considering the applicability of contouring, etc.
- Develop and implement a Waste Management Plan for handling on site waste.
- Designate an appropriate area where waste can be stored before disposal.
- General Waste must be disposed of at a registered landfill site.
- Wherever possible, construction activities must be undertaken during the driest part of the year to minimize downstream sedimentation due to excavation, etc.
- When not possible, suitable stream diversions structures must be used to ensure that rivers/streams are not negatively impacted by construction activity.
- Aquatic: The final design must avoid the indicated No-Go areas.
- Aquatic: A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to micro-siting of the final layout.
- Aquatic: A Stormwater Management Plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems. The stormwater management infrastructure must be designed to ensure the runoff from the development is not highly concentrated before entering the buffer area.
- Avifauna: If more than five years elapses between this study and construction, there may be a need to conduct further monitoring on site to determine whether any significant avifaunal features have changed in the interim.
- Avifauna: A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the BA process and the construction phase. This should be done between October and March, and ideally not more than 3 months before the start of construction.
- Avifauna: A Biodiversity Management Plan (BMP) must be designed by an ornithologist for the site prior to the Commercial Operation Date (COD). This BMP should include a bird fatality threshold and adaptive management policy, which identifies the number of bird fatalities of priority species which will trigger a management response, appropriate responses, and timelines for such responses. Fatalities of priority bird species are usually rare events (but with very high consequence) and it is difficult to analyse trends or statistics related to these fatalities as they occur. It is therefore important to have a threshold policy in place proactively to assist adaptive management. The BMP should form an annexure of the operational EMPr for the facility. This document has been prepared as part of the BAR, please see Appendix E.
- A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding. This programme will reduce the amount of available vulture food on site and reduce vulture-turbine collision risk. This programme will require the deployment of a dedicated (i.e. no other tasks) and adequately resourced (transport, binoculars, GPS, cameras, training) team of staff to patrol the full site during all daylight hours. This team will need to have a vehicle and the appropriate equipment to be able to dispose of large dead animals off site. This programme must be operational by the time the first turbine blades are turning on site and should not wait for COD. A full detailed protocol for this programme is included as Appendix 10 and must be updated and included in the BMP/EMPr. This programme should if possible be combined with the initiation of a 'vulture restaurant' a suitable distance off site – where vultures are fed (and the above mentioned carcasses are disposed of) in order to provide an attraction for vultures away from the turbines.
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13.9.2 CONSTRUCTION RECOMMENDATIONS

The following general Construction Phase mitigation actions are recommended:

- Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following:
  - Damping down of un-surfaced and un-vegetated areas;
  - Retention of vegetation where possible;
  - Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;
  - A speed limit of 40km/h must not be exceeded onsite dirt roads;
- Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.
- There must be no burning of construction waste or debris onsite.
- Burning of vegetation is not permitted on site.
- Smoking on site must be confined to a designated area in the vicinity of the site office which must be equipped with the necessary fire extinguishers.
- The recommendations of the stormwater management plan must be implemented to avoid soil erosion and siltation of drainage line.
- There must be no earthworks within 32m of the drainage lines to avoid contamination of water sources (except for road construction, where approved).
- A Waste Management Plan incorporating recycling and waste minimisation must be implemented. The Waste Management Plan must be explained to all employees as part of the environmental induction training.
- The storage of fuels and hazardous materials must be located away from sensitive water resources.
- All hazardous substances (e.g. diesel, oil drums, etc.) must be stored in a bunded area.
- The recommendations of the Stormwater Management Plan must be implemented during construction.
- All construction materials must be stored in a central and secure location with controlled access with an appropriate impermeable surface.
- Materials used for infilling must be suitably stabilized to ensure that scour and erosion of the existing bed/banks is exacerbated.

The following aquatic Construction Phase mitigation actions are recommended:

- Where large cut and fill areas are required, these must be stabilised and rehabilitated during the construction process, to minimise erosion and sedimentation.
- Suitable stormwater management systems must be installed along roads and other areas and monitored during the first few months of use. Any erosion / sedimentation must be resolved through whatever additional interventions maybe necessary (i.e., extension, energy dissipaters, spreaders, etc).
- Use existing roads or upgrade existing tracks to cross wetlands rather than constructing entirely new roads wherever possible.
- Use the smallest possible working corridor. Outside the working corridor, all watercourses are to be considered no go areas. Any unnecessary intrusion into these areas is prohibited. Where intrusion is required, the working corridor must be kept to a minimum and demarcated clearly, before any construction commences.
- Removal of vegetation must only be when essential for the continuation of the project. Do not allow any disturbance to the adjoining natural vegetation cover or soils.
- All pipe culverts must be removed and replaced with suitable sized box culverts, where road levels are raised. Crossings that are installed below the natural ground level are to be constructed with an appropriate drop inlet structure on the upstream side to ensure that headcut erosion does not develop as a result of the gradient change from the natural ground level to the invert level of the culvert.
- The channel profile, regardless of the current state of the river / water course, will be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a pre-construction walkdown.

- Water diversions must be temporary in nature and no permanent walls, berms or dams may be installed within a watercourse. Sandbags used in any diversion or for any other activity within a watercourse must be in a good condition, so that they do not burst and empty sediment into the watercourse. Upon completion of the construction at the site, the diversions shall be removed to restore natural flow patterns. Under no circumstance shall a new channel or drainage canals be excavated to divert water away from construction activities.
- Any fauna (frogs, snakes, etc.) that are found within the construction area must be moved to the closest point of similar habitat type outside of the areas to be impacted.
- All disturbed areas beyond the construction site that are intentionally or accidentally disturbed during the construction phase must be rehabilitated.
- It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas.
- The buffer area must be considered as a No-Go area for development and large infrastructure.
- The volume and velocity of water must be reduced through discharging the surface flow at multiple locations surrounding the development, preventing erosion.
- Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil. Contingency plans must be in place for high rainfall events which may occur during construction.
- Monitoring of the project activities is essential to ensure the mitigation measures are implemented. Compliance with the mitigation recommendations must be audited by a suitably qualified independent Environmental Control Officer with an appropriately timed (monthly) audit report.
- Sedimentation must be minimised with appropriate measures. Any construction, within or directly upslope of a watercourse, causing bare slopes and surfaces to be exposed to the elements must include measures to protect against erosion using rows of silt fences, sandbags, hay bales and/or earthen berms spaced along contours at regular intervals. Construction must have contingency plans for high rainfall events during construction.
- Energy dissipaters should be installed to prevent scour at any culvert outlet. This can be constructed of appropriately sized rock armour. Coarse bedding material or geotextile wrapped dump rock must be considered for use wherever the roads crosses wetland characterized by diffuse subsurface flows such as the seeps.
- Stormwater infrastructure must be inspected at least once every year (before the onset of rains) to ensure that it is working efficiently. Any evidence of erosion from this stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters.
- All liquid chemicals including fuels and oil, including for the BESS, must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. Such facilities must be inspected routinely and must have the suitable PPE and spill kits needed to contain likely worst-case scenario leak or spill in that facility, safely.
- Washing and cleaning of equipment must be done in designated wash bays, where rinse water is contained in evaporation/sedimentation ponds (to capture oils, grease cement and sediment).
- Mechanical plant and bowsers must not be refuelled or serviced within 100m of a river channel.
- All construction camps, lay down areas, wash bays, batching plants or areas and any stores should be more than 50 m from any demarcated water courses.
- Littering and contamination associated with construction activity must be avoided through effective construction camp management.
- No stockpiling should take place within or near a water course.
- All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable.

- ESO monitors the site on a daily basis to ensure plant is in working order (minimise leaks), spills are prevented and if they do occur, are quickly rectified.

The following avifaunal Construction Phase mitigation actions are recommended:

- The No-Go areas identified by this study (which build on those identified in the screening phase) should be adhered to.
- No internal medium voltage power lines (33kV) should be overhead.
- All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.
- A post construction inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species. It is essential that the new wind farm does not create favourable conditions for such mammals in high risk areas. We therefore recommend that within the first year of operations a full assessment of this aspect be made by the ornithologist contracted for post construction monitoring. If such conditions have been created case specific solutions will need to be developed and implemented by the wind farm.
- A Biodiversity Management Plan (BMP) must be designed by an ornithologist for the site prior to the Commercial Operation Date (COD). This BMP should include a bird fatality threshold and adaptive management policy, which identifies the number of bird fatalities of priority species which will trigger a management response, appropriate responses, and timelines for such responses. Fatalities of priority bird species are usually rare events (but with very high consequence) and it is difficult to analyse trends or statistics related to these fatalities as they occur. It is therefore important to have a threshold policy in place proactively to assist adaptive management. The BMP should form an annexure of the operational EMPr for the facility.
- A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding. This programme will reduce the amount of available vulture food on site and reduce vulture-turbine collision risk. This programme will require the deployment of a dedicated (i.e. no other tasks) and adequately resourced (transport, binoculars, GPS, cameras, training) team of staff to patrol the full site during all daylight hours. This team will need to have a vehicle and the appropriate equipment to be able to dispose of large dead animals off site. This programme must be operational by the time the first turbine blades are turning on site and should not wait for COD. A full detailed protocol for this programme is included as Appendix 10 and must be updated and included in the BMP/EMPr. This programme should if possible be combined with the initiation of a 'vulture restaurant' a suitable distance off site – where vultures are fed (and the above mentioned carcasses are disposed of) in order to provide an attraction for vultures away from the turbines.

The following bat Construction Phase mitigation actions are recommended:

- Avoid High sensitive areas. Currently, no proposed turbines (including their full rotor swept areas) encroach on High sensitive areas. Ensure that any new buildings, substation, BESS, construction camp, laydown areas, and possible quarry/ies avoid all High sensitive areas and instead, are positioned ideally in Medium sensitive areas.
- Minimize disturbance of Medium-High sensitive areas. Currently, no proposed turbines (including their full rotor swept areas) encroach on Medium-High sensitive areas.
- Implement curtailment of turbines in Medium sensitive areas, as soon as the first turbine is operational, below an initial cut-in speed of 5 m/s during temperatures of 12 °C or warmer for four hours after sunset from 1 June to 31 October, and from sunset to sunrise from 1 November to 31 May. The 5 m/s turbine cut-in wind speed represents the wind speed associated with approximately 50% of all bat activity recorded at 73-110 m above ground level in 2021/2022 by IWS.
- Minimize road impacts. Minimize the length and breadth of proposed roads, and thus minimize the clearing and disturbance of natural areas (including potential bat roosting habitat).

- Avoid blasting within 2 km of a confirmed roost.
- Minimize degradation of terrestrial habitat (potential bat foraging and roosting habitat). Implement and maintain effective invasive alien plant, stormwater, erosion, sediment, and dust control measures.
- Ensure that turbines can be fitted with bat detectors and deterrent devices. Turbine engineers must consult with bat specialists to incorporate the necessary turbine adaptations for this during the design phase, so there are no unexpected surprises or concerns after the turbines are built.
- Minimize artificial lighting on site. Apart from compulsory civil aviation lighting, minimize artificial lighting - especially high-intensity, steady-burning, sodium vapour, quartz, halogen, and other bright lights at sub-stations, offices, and turbines. All non-aviation lights should be hooded downward and directed to minimise horizontal and skyward illumination. Where possible, solar-powered motion-sensitive lights should be used.
- Commence again with acoustic bat monitoring. A detector(s) should be installed on the meteorological mast just before construction commences, and monitoring should occur throughout construction, during the first and second years of operation, and again during the fifth year of operation, and every fifth year thereafter.
- Perform operational bat monitoring as soon as the first turbine is operational - as per the latest SABAA guideline for this (Aronson et al. 2020 or later). The quality of the operational monitoring and data analysis are to be conducted to a high standard so that there is confidence in the data and the fatality estimate results.
- Adaptively manage bat fatalities by consulting the latest SABAA guideline for this (Aronson et al. 2020 or later), and the best available relevant scientific information. The specialist conducting the Year 1 and Year 2 operational monitoring should provide recommendations for adaptive management of the above strategy after the second year of operational monitoring. Allowance should be made in the financial provision for adaptive management and mitigation of bat fatalities.
- If the operational bat monitoring and data analysis are not conducted properly as per Aronson et al. 2020 (or later), and/or if the bat fatality threshold is exceeded (determined as per MacEwan et al. 2018 or later), improved bat fatality mitigation must be promptly implemented. Unless the WEF's operational bat monitoring data suggest otherwise, and/or unless there are other measures that have been proven to effectively mitigate bat fatalities at WEFs, turbine curtailment should be implemented below an initial cut-in speed of 7 m/s during temperatures of 12 °C or warmer for four hours after sunset from 1 June to 31 October, and from sunset to sunrise from 1 November to 31 May. The 7m/s turbine cut-in wind speed represents the wind speed associated with approximately 80% of all bat activity recorded at 73-110 m above ground level in 2021/2022 by IWS.
- Submit quarterly and annual bat fatality monitoring reports to SABAAP (the South African Bat Assessment Association Panel), EWT (the Endangered Wildlife Trust), and the DEFF (the national Department of Environment, Forestry and Fisheries).
- Forward all (live and fatality) bat monitoring data to the database recommended by SABAA to expand the scientific knowledge base for more informed decision making and mitigation.
- Rehabilitate disturbed terrestrial habitat and water resources (bat foraging habitat). Implement effective rehabilitation of disturbed terrestrial habitat and water resources based on consultation with an appropriate experienced specialist(s). Carefully manage alien vegetation, livestock grazing, and water points.

The following ecological Construction Phase mitigation actions are recommended:

- An Erosion Management Plan / Method Statement should be compiled and implemented during the Construction Phase.
- Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion.
- Disturbed areas must be rehabilitated as soon as possible after construction.
- The site must be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion.

- Vegetation clearance must be strictly limited to that which is necessary for the construction of the proposed Ngxwabangu WEF. Blanket and strip clearing should be avoided where possible.
- Maintain basal cover where possible and reduce/control soil erosion. These important management actions for restoring and maintaining healthy grasslands.
- Where excavation is required, topsoil should be removed and managed for use during rehabilitation. Topsoil often contains a large seedbank which can aid in the restoration of impact areas.
- Impacted areas that do not form part of the development footprint, and which are not required during the operational phase, must be rehabilitated as soon as possible after construction. Impacted areas should be spread with topsoil and planted species indigenous to the natural vegetation type of the project area.
- Where possible, lay down areas should be located within previously disturbed areas. Laydown areas cannot be located within sensitive areas such as wetlands/ forest patches.
- Employees must be prohibited from making open fires during the construction phase.
- Existing roads must be utilised as far as practically and feasibly possible.
- An Alien Invasive Management Plan must be compiled and implemented during all phases of the proposed development.
- The footprint of the proposed development must be micro-sited prior to construction. Should populations of threatened SCC be identified during micro-siting, the design and placement of the turbine hardstands and associated infrastructure components should be amended to avoid these populations. If this is not possible, permits for the removal and translocation of these populations must be obtained. Should translocation of threatened SCC be required, threatened SCC must be translocated to the same habitat type by a qualified botanist/horticulturalist.
- Do not use herbicides or hoeing in the creation of firebreaks.
- A Fire Management Plan must be drafted by a suitably qualified specialist and implemented during the operation of the proposed Ngxwabangu WEF
- Permits must be obtained for the removal/translocation of SCC protected in terms of the PNCO.
- All forest patches must be delineated and declared as no-go areas.
- A 50 m no-go buffer must be established and delineated around all forest patches within the project area.
- No construction activities must be permitted within no-go areas.
- The footprint of turbine hardstands, roads, and other project related infrastructure must be micro-sited prior to construction. Should populations of threatened SCC be identified during micro-siting, the design and placement of the project components should be amended to avoid these populations. If this is not possible, permits for the removal and translocation of these populations must be obtained. Should translocation of threatened SCC be required, threatened SCC must be translocated to the same habitat type by a qualified botanist/horticulturalist.
- Permits for the removal of plant species protected in terms of the Nature and Environmental Conservation Ordinance 19 of 1974, TOPS and List of Protected Trees must be obtained prior to vegetation clearance/translocation.
- Construction vehicles and machinery must not encroach into identified ‘no-go’ areas or areas outside the project footprint.
- Any impacted areas outside of the development footprint must be rehabilitated using indigenous plant species commonly occurring within the vegetation types of the project area.
- Identify and maintain ecological corridors within the broader landscape to ensure the maintenance of ecosystem processes.
- The site must be checked regularly for the presence of alien invasive species.
- All alien invasive species that establish as a result of the project must be removed and disposed of as per the Working for Water Guidelines.
- An Alien Invasive Management Plan must be compiled and implemented from the proposed Ngxwabangu WEF, BESS and Grid Connection.

- The relevant permit must be acquired for any removal of amphibians and reptiles within the study area that are listed as either Schedule I or II on the PNCO.
- All construction staff must be educated with regards to wildlife conservation, and all staff employed by the developer must ensure that any amphibians or reptiles encountered during construction of the proposed development are not harmed or killed.
- Amphibians and reptiles encountered must be allowed to move away from the construction area. In the event they need to be translocated, amphibians must be released in the same catchment areas while reptiles must be relocated to directly adjacent areas of the proposed development. No amphibian or reptile species may be removed off site without proper authorisation from the relevant authority.
- A rescue plan must be developed to protect reptiles which could fall into construction pits.
- The appointed ESO should be trained in snake handling and removal techniques.
- Any amphibian or reptile species that may die due to construction activities associated with the proposed development must be recorded (e.g., photographed and GPS coordinates taken) and reported to the appointed ECO and relevant authorities (i.e., EWT). Where needed, the carcass should be donated to SANBI.
- All individuals, including construction workers, must sign a register prior to accessing the construction site.
- Construction workers must not be housed on site.
- Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads.
- The construction of turbine handstands or project related infrastructure on rocky outcrops and/or permanent waterbodies must be avoided. Moreover, some amphibian species breed in temporary waterbodies, therefore it is recommended that where possible construction activities should take place outside of the wet and rainy season.
- All reasonable and feasible measures should be implemented to reduce noise in ecologically sensitive areas.
- The relevant permit must be acquired for the removal of any mammals within the study area that are listed as either Schedule I or II on the PNCO.
- Any mammals encountered must be allowed to move away from the construction area. No mammal may be removed off site without proper authorisation from the relevant authority.
- Any mammal species that may die due to construction activities associated with the proposed development must be recorded (e.g., photographed and GPS coordinates taken) and reported to the appointed ECO and relevant authorities (i.e., EWT). Where needed, the carcass should be donated to SANBI.
- A Search and Rescue Operation must be undertaken for protected amphibian and reptile species.
- The relevant permit must be acquired for the removal of any amphibians and reptiles within the study area that are listed as ether Schedule I or II on the PNCO.
- Not all areas can be avoided, but it is recommended that construction staff must be educated with regards to wildlife conservation and that all staff employed by the developer ensure that any amphibians or reptiles encountered are not harmed or killed.
- Amphibians or reptiles encountered must be allowed to move away from the construction area. In the event they need to be translocated, amphibians must be released in the same catchment area while reptiles must be relocated to directly adjacent areas of the proposed development. No amphibians or reptiles may be removed off site without proper authorisation from the relevant authority.
- Where possible, amphibian or reptile SCC observed on site must be recorded (photographed, GPS coordinates taken) and loaded onto iNaturalist by the appointed ESO.
- The hunting, baiting, or trapping of mammals by construction staff must be strictly prohibited.
- The appointed ESO should inquire and undertake an overview inspection of the site for the evidence of snares during the construction phase.

The following heritage Construction Phase mitigation actions are recommended:

- Site Monitoring: Regular examination of trenches and excavations.
- Monitor as frequently as practically possible. Preferred Mitigation Procedure: Avoidance: Implement a heritage conservation buffer of at least 100m around the heritage resource, redesign infrastructure to avoid the heritage resource and the proposed conservation buffer.
- Alterative Mitigation Procedure (if preferred mitigation procedure is not feasible): Documentation of sites if features are to be impacted on by development (mapping, desktop study Phase 2 site sampling). Permitting if and when required.
- Social Consultation: It is suggested that local communities be consulted with regards to the religious and social meaning of the site and possible impacts / management of the site.
- Avoidance: Implement a heritage conservation buffer of at least 50m from all burials / graves. Where digging / construction encroaches on this buffer, erect a temporary construction barricade around burials to clearly indicate the location of burials. Implement a site management plan detailing strict site management conservation measures.
- Grave Relocation: Relocation of burials and documentation of site, full social consultation with affected parties, possible conservation management and protection measures. Subject to authorisations and relevant permitting from heritage authorities and affected parties.

The following noise Construction Phase mitigation actions are recommended:

- It is recommended that the applicant plan that access roads are not constructed at night.
- Plan construction schedule that such simultaneous activities are only required at one WTG location (located within 1,000m from an NSR). Other simultaneous construction activities can continue, but should take place further than 1,000m from NSR; and
- Minimise active equipment at night, planning the completion of noisiest activities (though unlikely, could include activities such a pile driving, rock breaking and excavation) during the daytime period.

The following palaeontology Construction Phase mitigation actions are recommended:

- A Chance Find Palaeontology Management Plan must be implemented during the construction phase.

The following socio-economic Construction Phase mitigation actions are recommended:

- The wind energy facility developer, EDF Renewables, should prescribe that the EPC contractor prioritises local procurement of goods and services where possible from nearby sourcing hubs being Komani and Mthatha. This will be limited to more general construction related goods and services as well as generic machinery.
- The EPC should also be encouraged to raise awareness amongst local businesses as well as aspiring entrepreneurs within the study area prior to the construction taking place. Awareness should extend to catering companies as well as accommodation businesses in the nearby towns and generic construction businesses as mentioned above.
- Sub-contract to local construction and transport companies particularly MSME's, B-BBEE compliant and women-owned enterprises where possible.
- Use local suppliers where feasible and arrange with the local MSME's to provide transport, catering and other services to the construction crews.
- Co-ordinate and arrange local community meetings through the Instika Yethu local municipality, labour unions and local traditional councils to advise the local labour force about the proposed project and the jobs that can potentially be applied for.
- Establish numerous local skills desks to determine the potential skills that could be sourced from the area. Skills desks could be located at the stone quarry and the Lubisi conference centre found in the Mcambalala traditional council as well as the local clinic found within the proposed study area as well as in nearby towns such as Cofimvaba and Komani.
- Recruit local labour as far as feasible.
- Provide the local labour force with necessary training prior to the construction phase.
- Employment of labour-intensive methods in construction where feasible.

- Facilitate knowledge and skills transfer between highly specialised technical experts and South African professionals during the pre-establishment and construction phases.
- Provide basic construction training to recruited local members before the construction phase takes place.
- Set up apprenticeship programmes to build onto existing skill levels or develop new skills amongst construction workers especially those from the local communities.
- Improved labour productivity and employability of construction workers for similar projects proposed in the province.
- Possible development of provincial skills and expertise in R&D and manufacturing, specialist services and construction industries related to the wind energy industry through partnerships with Nelson Mandela University, Rhodes University, Walter Sisulu University and the University of Fort Hare.
- Recruit local labour as far as feasible to increase the benefits to the local households.
- Employ labour intensive methods in construction where feasible.
- Sub-contract to generic local construction companies where possible.
- Use local suppliers where feasible and arrange with local MSME's and B-BBEE compliant enterprises to provide transport, catering and other services to the construction crews.
- Set up a recruitment office in the nearby towns (such as Cofimvaba and Komani) and adhere to strict labour recruitment practices that would reduce the desire of potential job seekers to loiter around the area in the hope of finding temporary employment.
- Control the movement of workers between the site and areas of temporary residence to minimise loitering around the site. This should be achieved through the provision of scheduled transportation services between the construction site and area of residence.
- Involve the traditional leaders from the four administrative areas of the study area to inform the EPC contractor and the proposed development team at large about the cultural and religious land practices that are followed in the study area.
- The traditional leaders should be encouraged to assign a reliable person in their respective administration area to deal with complaints of their community members.
- Employ locals as far as feasible through the creation of a local skills database.
- Establish a management forum comprising of key stakeholders to monitor and identify potential problems that may arise due to the influx of job seekers to the area.
- Ensure that any damages or losses to nearby buildings that can be linked to the conduct of construction workers are adequately reimbursed.
- Assign a dedicated person to deal with complaints and concerns of affected parties.
- Provide adequate signage along relevant road networks to warn the motorists of the construction activities taking place on the site.
- Engage with local authorities and inform them of the development as well as discuss with them their ability to meet the additional demands on social and basic services created by the in migration of workers.
- Where feasible, assist the municipality in ensuring that the quality of the local social and economic infrastructure does not deteriorate through the use of social responsibility allocations.
- The developer and EPC contractor should ensure prior to the construction phase that they make use of their own mobile social services and economic infrastructure as far as possible, i.e., the use of a mobile clinic on site for the construction team as well as a generator for their own electricity supply as well as water tanks and boreholes as suitable water sources
- The mitigation measures proposed by the visual and noise specialists should be adhered to.
- Natural environments that are not affected and needed by the proposed development should remain untouched. Regulations of boundaries of such areas need to be made transparent between the local community's leaders, the developer and EPC contractor prior to the development's construction phase.
- Efforts should also be made to avoid disturbing such sites during construction.

The following visual Construction Phase mitigation actions are recommended:

- Ensure that vegetation is not unnecessarily removed during the construction period.

- Reduce the construction period through careful logistical planning and productive implementation of resources.
- Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
- Reduce and control construction dust using approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
- Where possible, restrict construction activities to daylight hours in order to reduce lighting impacts as much as possible.
- Rehabilitate all disturbed areas immediately after the completion of construction works.
- Reduce the construction period through careful logistical planning and productive implementation of resources.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.

13.9.3 OPERATIONAL RECOMMENDATIONS

The following general Operational Phase mitigation actions are recommended:

- All project structures and buildings must be maintained.
- All hazardous substances must be stored in appropriately bunded locations.
- Recommendations of the Stormwater Management Plan must be implemented and monitored.
- A Waste Management Plan incorporating recycling and waste minimisation must be implemented. The Waste Management Plan must be explained to all employees as part of the environmental induction training.

The following avifaunal Operational Phase mitigation actions are recommended:

- An observer or technology led turbine Shutdown on Demand (SDOD) programme must be implemented on site from COD. In South Africa, observer led Shutdown on Demand has recently shown promise at an operational wind farm in the Western Cape. It is likely that by the time of construction of the proposed project more experience on this mitigation will be available in country. This is required in order to mitigate the risk of turbine collision for Cape Vulture in particular, but will also address risk to other species. If an observer led programme is used, this programme must consist of a suitably qualified, trained and resourced team of observers present on site for all daylight hours 365 days of the year. This team must be stationed at vantage points with full visible coverage of all turbine locations. The observers must detect incoming priority bird species, track their flights, judge when they enter a turbine proximity threshold, and alert the control room to shut down the relevant turbine until the risk has reduced. A full detailed protocol is included in Appendix 11 and must be updated and included in the BMP/EMPr. If a technology led option is used, preference should be given to a system that has been independently reviewed for efficacy. We crudely estimated how many shutdowns could be expected based on pre-construction monitoring data. When Cape Vulture flight paths are clipped to a 500m proximity to the current turbine layout, 26 records were made in 360 hours of observation. This translates into a passage rate of 0.072birds/hr. Converting this to a year results in approximately 315 shutdown events per year. At an assumed 10 minutes shutdown at 1 turbine per event, this means 3 150 minutes of turbine downtime in a year. The facility of 36 turbines will operate for a total of 18 921 600 minutes per year (24hrs x 60 minutes x 365days x 36 turbines) this equates to 0.01% lost operating time. Even if the estimate is wrong and the real loss is ten times higher, it would be 0.1%. EDFR has confirmed that this is acceptable to them.

- One turbine blade must be painted according to a protocol currently under development by the South African Wind Energy Association (SAWEA) from the outset. Provision must be made by the developer for the resolution of any technical, warranty, supplier challenges that this may present.
- Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off site. The facility will need to address other sources of mortality of priority species in a measurable way (according to best practice) so as to compensate for residual effects on the facility itself. An example of such off-site mitigation could be the retrofitting of insulation onto existing Eskom power lines in the project vicinity which pose an electrocution risk to vultures. This is a measurable impact which is not currently mitigated adequately by Eskom due to the cost. The project could contribute to the cost of such mitigation. Please see Biodiversity Offset Strategy in Appendix E of this report.

The following bat Operational Phase mitigation actions are recommended:

- Implement curtailment of turbines in Medium sensitive areas, as soon as the first turbine is operational, below an initial cut-in speed of 5 m/s during temperatures of 12 °C or warmer for four hours after sunset from 1 June to 31 October, and from sunset to sunrise from 1 November to 31 May. The 5 m/s turbine cut-in wind speed represents the wind speed associated with approximately 50% of all bat activity recorded at 73-110 m above ground level in 2021/2022 by IWS.
- Ensure that turbines can be fitted with bat detectors and deterrent devices. Turbine engineers must consult with bat specialists to incorporate the necessary turbine adaptations for this during the design phase, so there are no unexpected surprises or concerns after the turbines are built.
- Minimize artificial lighting on site. Apart from compulsory civil aviation lighting, minimize artificial lighting - especially high-intensity, steady-burning, sodium vapour, quartz, halogen, and other bright lights at sub-stations, offices, and turbines. All non-aviation lights should be hooded downward and directed to minimise horizontal and skyward illumination. Where possible, solar-powered motion-sensitive lights should be used. This must be done in accordance with relevant H&S Regulations.
- Commence again with acoustic bat monitoring. A detector(s) should be installed on the meteorological mast just before construction commences, and monitoring should occur throughout construction, during the first and second years of operation, and again during the fifth year of operation, and every fifth year thereafter.
- Perform operational bat monitoring as soon as the first turbine is operational - as per the latest SABAA guideline for this (Aronson et al. 2020 or later). The quality of the operational monitoring and data analysis are to be conducted to a high standard so that there is confidence in the data and the fatality estimate results. If the operational monitoring and data analysis are not conducted properly as per Aronson et al. 2020 (or later), the prescribed curtailment Regime 1 should be implemented at all turbines at the WEF.
- Adaptively manage bat fatalities by consulting the latest SABAA guideline for this (Aronson et al. 2020 or later), and the best available relevant scientific information. The specialist conducting the Year 1 and Year 2 operational monitoring should provide recommendations for adaptive management of the above strategy after the second year of operational monitoring. Allowance should be made in the financial provision for adaptive management and mitigation of bat fatalities. If the bat fatality threshold is exceeded (determined as per MacEwan et al. 2018 or later), further adaptive management and mitigation (possibly including greater curtailment) must be implemented (refer to Aronson et al. 2020 or later).
- Submit quarterly and annual bat fatality monitoring reports to SABAAP (the South African Bat Assessment Association Panel), EWT (the Endangered Wildlife Trust), and the DEFF (the national Department of Environment, Forestry and Fisheries).
- Forward all (live and fatality) bat monitoring data to the database recommended by SABAA to expand the scientific knowledge base for more informed decision making and mitigation.
- Rehabilitate disturbed terrestrial habitat and water resources (bat foraging habitat). Implement effective rehabilitation of disturbed terrestrial habitat and water resources based on consultation with an

appropriate experienced specialist(s). Carefully manage alien vegetation, livestock grazing, and water points.

The following ecological Operational Phase mitigation actions are recommended:

- Regular maintenance and checks of the infrastructure must be undertaken.
- External lighting should be avoided where possible. However, if required, lighting should be down lighting and low wattage.
- Access to the site should be minimised.
- All individuals must sign a register prior to accessing the proposed development site.
- Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads.
- All areas disturbed during construction that do not form part of the proposed development must be rehabilitated. Topsoil from nearby areas of the same vegetation type must be spread over impacted area and planted with indigenous plant species.
- A Fire Management Plan must be drafted by a suitably qualified specialist and implemented during the operation of the proposed Ngxwabangu WEF.
- The site must be checked regularly for the presence of alien invasive species. When alien invasive species are found, immediate action must be taken to remove them.
- The ECO must create a list with accompanying photographs of possible alien invasive species that could occur on site prior to construction. This photo guide must be used to determine if any alien invasive species are present.
- An Alien Invasive Management Plan must be compiled and implemented during the Construction and Operational Phase of the proposed Ngxwabangu WEF.

The following noise Operational Phase mitigation actions are recommended:

- The applicant must confirm the status of structures located in areas where noise levels exceed 45 dBA, confirming that it is not used for residential purposes. If these structures are used for residential purposes the applicant must implement appropriate mitigation measures (see Section 11.2 of the Noise Impact Assessment) to ensure that noise levels due to operating WTG are less than 45 dBA.
- The applicant must confirm the status of structures located in areas where noise levels exceed 45 dBA, confirming whether it is not used for residential purposes. If these structures are used for residential purposes the applicant must implement appropriate mitigation measures (see Section 11.2) to ensure that noise levels due to operating WTG are less than 45 dBA.

The following socio-economic Operational Phase mitigation actions are recommended:

- The operator of the wind energy facility and its related infrastructure should be encouraged to, as far as possible, procure materials, goods and products required for the operation and maintenance of the facility from local suppliers to increase the positive impact in the local economy.
- Aspiring entrepreneurs from the local communities should be encouraged to formally register their MSMEs in order to do business with the IPP- this would specifically apply to MSMEs within the security and cleaning/cleansing sub-industries.
- Sufficient economies of scale could be created to establish new businesses in the provincial economy. These businesses could then supply the goods and services required for the operation and maintenance of the facility that cannot currently be procured in the area. This would contribute to the local economies' growth and development. Given that this project would be the first of its kind within the region, these cumulative impacts will only materialise over time.
- Where possible, local labour should be considered for employment to increase the positive impact on the local economy.
- Only source Cape Vulture and other live birds and animal spotters from the immediate study area.

- As far as possible, local small and medium enterprises should be approached to investigate the opportunities for supply inputs required for the maintenance and operation of the wind energy facility and related infrastructure.
- The developer should consider establishing vocational training programmes for the local labour force to promote the development of skills required by the wind energy facility and their related infrastructure and thus provide for the opportunities for these people to be employed in other similar facilities elsewhere.
- Where possible, the local labour supply should be considered for employment opportunities to increase the positive impact on the area's economy.
- As far as feasible, local small and medium enterprises should be approached to investigate the opportunities for supply inputs required for the maintenance and operation of the wind energy facility and their related infrastructure.
- An innovative and site-specific ED and SED programme should be devised by the developer and regularly updated throughout the project's lifespan.
- Recommend and advertise accommodation at the Lubisi Lodge and Conference centre for overnight stays and hosting meetings and conferences related to the proposed development or for other business ventures and educational tourism expeditions.
- The developer should encourage the operational manager and team to be open to hosting safe site visits for local schools and colleges for educational purposes.
- The plan should be developed in consultation with local authorities and local communities to identify community projects that would result in the greatest social benefits.
- These plans should be reviewed on an annual basis and, where necessary, updated.
- When identifying enterprise development initiatives, the focus should be on creating sustainable and self-sufficient enterprises.
- In devising the programmes to be implemented, the developer should take into account the priorities set out in the local IDP.
- The mitigation measures proposed by the visual and noise specialists should be adhered to.

The following visual Operational Phase mitigation actions are recommended:

- Maintain the general appearance of the site as a whole.
- Lighting should be kept to a minimum wherever possible.
- Aviation standards and CAA Regulations for turbine lighting must be followed.
- The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, must be investigated.
- Install aircraft warning lights that only activate when the presence of an aircraft is detected, if permitted by CAA.

13.9.4 DECOMMISSIONING RECOMMENDATIONS

The following mitigation measures must be implemented during the operational phase:

- This section of mitigation measures must be reassessed by a suitably qualified EAP and specialists prior to decommissioning.
- Littering must be avoided, and litter bins must be made available at various strategic points on site. Refuse from the construction site must be collected on a regular basis and deposited at an appropriate landfill.
- Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following
  - Damping down of un-surfaced and un-vegetated areas;
  - Retention of vegetation where possible;
  - Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;
  - A speed limit of 40km/h must not be exceeded on dirt roads;

- Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.
- Construction vehicles and machinery must make use of existing infrastructure such as roads as far as possible to minimise disturbance on the receiving environment.
- After the removal of all wind turbine-related structures, the disturbed soils must be re-vegetated to avoid unnecessary soil erosion.

Based on current available information the turbines will be removed as per the above specifications. It is recommended that a new and up-to-date impact assessment is undertaken prior to this process to ensure that the latest relevant guidelines and policy on wind farm decommissioning are factored into the process. Should new technology be available to replace the structures then, depending on the legislation relevant at the time, the EAP recommends a new impact assessment process prior to being able to do so. The DFFE would be required to approve any decommissioning or replacement process.

13.9.5 MONITORING RECOMMENDATIONS

- Avifaunal Monitoring:
  - The duration and scope of post-construction monitoring must be informed by the outcomes of the previous year's monitoring and must be reviewed annually. Post-construction monitoring of bird abundance and movements should span a minimum of one year and monitoring for fatalities should take place over a minimum of two to three years and repeated at year five and every five years thereafter. The duration of monitoring must be increased should significant impacts be observed.
  - A contingency mitigation budget must be planned for in the operational phase to allow adaptive management of impacts that arise. If such a situation arises possible necessary mitigation measures could include: further research into the problem (including possibly bird tracking studies); human based turbine shutdown on demand; habitat alteration; bird deterrence from site; and any others identified as feasible at the time.
- Bat Monitoring
  - Post-construction/ operational bat monitoring must be performed according to the South African Good Practise Guidelines for Operational Monitoring for Bats at Wind Energy Facilities (Aronson et al 2014) or later version valid at the time of monitoring. IWS recommends the initial 2 years and then every third year for the remainder of the project.
  - Should operational monitoring show that adjusted annual bat fatalities (adjusted for biases such as searcher efficiency and carcass persistence) ever equal or exceed the threshold level of fatalities guided by SABAAP:
    - 60 bats per annum based on the thresholds provided for Drakensberg Montane Grasslands, Woodlands and Forest ecoregion in MacEwan et al. (2017).
    - 39 bats per annum based on site specific thresholds calculated according to the methods provided in MacEwan et al. (2017).
    - Both methods use the entire 6500ha project boundary area and both threshold levels apply to fatalities of single species, i.e. if two species were among the fatalities estimated for a site, the threshold would apply to each, not to the grouped number of all species combined.
  - Then mitigation actions will only be required at specific turbines that have killed 2 or more bats of the particular bat species that has exceeded the fatality threshold for the previous year of monitoring.
  - Such actions at the individual turbines include increasing the cut-in wind speed to 6m/s (only exposing 40% of bat activity to spinning blades).
  - When dealing with living animals that can respond in different and unpredictable ways to changing environmental, climatic and developmental parameters, it is very difficult to make guaranteed predictions. Lintott et al. (2016) state that the nightly and seasonal activity data collected during pre-construction surveys may provide an indication of the extent of curtailment that is required and

therefore the economic viability of the project, however, they highlight the need for a feedback mechanism for practitioners to share the success or failure of mitigation strategies, i.e. adaptive mitigation. The bat specialist conducting the operational monitoring has the right to make further recommendations should they see fit.

- Given the magnitude and extent of wind-turbine related bat fatalities worldwide, the conservation implications are critically important and bat fatalities must be avoided, minimised or mitigated proactively.

13.9.6 MANAGEMENT RECOMMENDATIONS

The following site-specific management plans must be included in the final EMPr.

- Alien Invasive Management Plan (High-level plan provided in Section 9.1 of the EMPr);
- Plant Rescue and Protection Plan (High-level plan provided in Section 9.1 of the EMPr);
- Avifauna Monitoring and Management Plan (High-level plan provided in Section 9.3 of the EMPr);
- Re-vegetation and Habitat Rehabilitation Plan (High-level plan provided in Section 9.1 of the EMPr);
- Open Space Management Plan (High-level plan provided in Section 9.2 of the EMPr);
- Traffic Management Plan (High-level plan provided in Section 9.4 of the EMPr);
- Transportation Plan (High-level plan provided in Section 9.4 of the EMPr);
- Stormwater Management Plan (High-level plan provided in Section 9.5 of the EMPr);
- Fire Management Plan (High-level plan provided in Section 9.7 of the EMPr);
- Erosion Management Plan (High-level plan provided in Section 9.5 of the EMPr);
- Monitoring System to detect any leakage or spillage of all hazardous substances (High-level plan provided in Section 9.6 of the EMPr);
- Measures to protect hydrological features (High-level plan provided in Section 9.2 and 9.5 of the EMPr);
- Biodiversity Management Plan (to be prepared);
- Cape Vulture Food Management Programme (to be prepared);
- Chance Fossil Finds Protocol (to be prepared);
- Aquatic Rehabilitation and Monitoring Plan (to be prepared);
- Emergency Response Action Plan (as per the Generic EMPr, to be prepared).

14 APPENDIX A: EAP AFFIRMATION

14.1 DR ALAN CARTER, DECLARATION

PLEASE FIND HERE WITHIN A SIGNED COPY OF THE DEPARTMENTAL EAP DECLARATION

15 APPENDIX B: CURRICULUM VITAE

15.1 DR ALAN CARTER

15.2 MS CAROLINE EVANS

15.3 MS ROBYN THOMSON

PLEASE FIND HERE WITHIN COPIES OF CVs

16 APPENDIX C: FULL IMPACTS TABLES

16.1 GENERAL IMPACTS TABLE

16.2 SPECIALIST IMPACTS TABLE

PLEASE FIND HERE WITHIN A3 VERSIONS OF THE IMPACTS TABLES

17 APPENDIX D: SPECIALIST REPORTS

17.1 AQUATIC IMPACT ASSESSMENT

17.2 AVIFAUNAL IMPACT ASSESSMENT

17.3 BAT IMPACT ASSESSMENT

17.4 ECOLOGICAL IMPACT ASSESSMENT

17.5 HERITAGE IMPACT ASSESSMENT

17.6 NOISE IMPACT ASSESSMENT

17.7 PALAEONTOLOGY IMPACT ASSESSMENT

17.8 SOCIO-ECONOMIC IMPACT ASSESSMENT

17.9 VISUAL IMPACT ASSESSMENT

18 APPENDIX E: BIODIVERSITY OFFSET STRATEGY

18.1 BIODIVERSITY OFFSET STRATEGY

19 APPENDIX F: SPECIALIST DECLARATIONS AND CVS

Please see within each specialist report

19.1 AQUATIC IMPACT ASSESSMENT

19.2 AVIFAUNAL IMPACT ASSESSMENT

19.3 BAT IMPACT ASSESSMENT

19.4 ECOLOGICAL IMPACT ASSESSMENT

19.5 HERITAGE IMPACT ASSESSMENT

19.6 NOISE IMPACT ASSESSMENT

19.7 PALAEONTOLOGY IMPACT ASSESSMENT

19.8 SOCIO-ECONOMIC IMPACT ASSESSMENT

19.9 VISUAL IMPACT ASSESSMENT

20 APPENDIX G: ENVIRONMENTAL MANAGEMENT PROGRAMMES (EMPRS): GENERIC AND APPENDIX 4

20.1 APPENDIX 4 EMPR

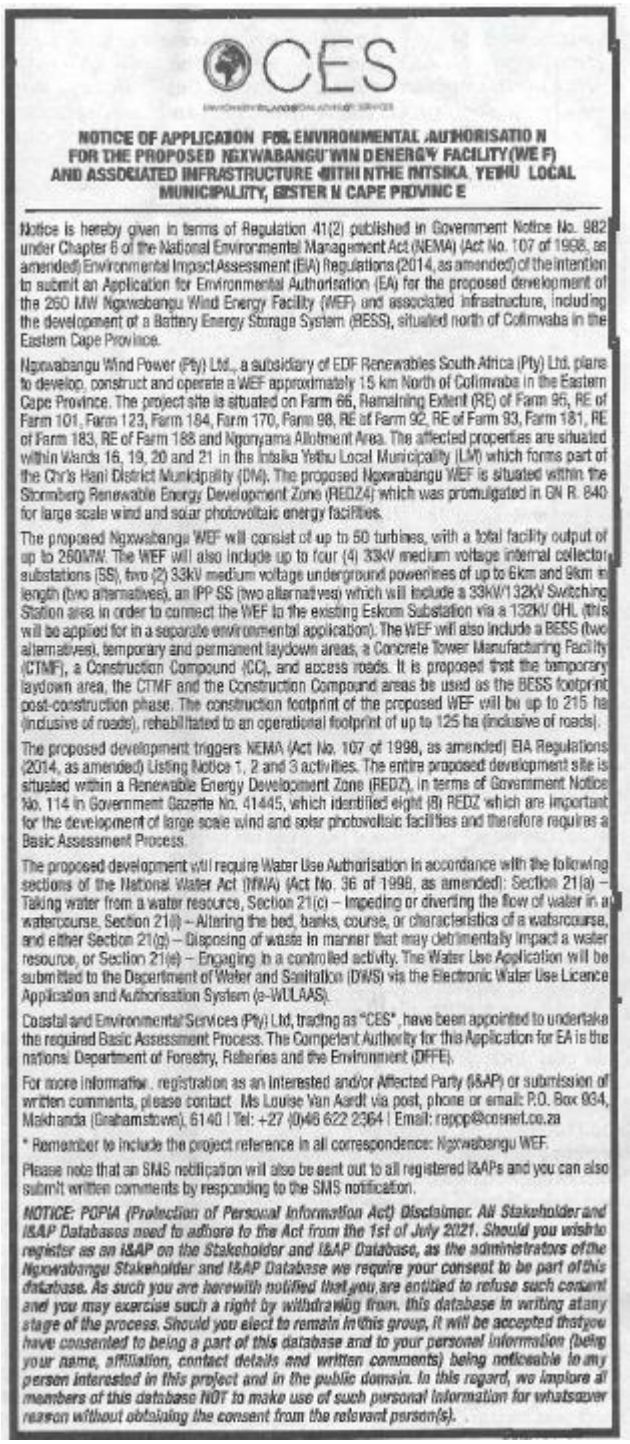
20.2 GENERIC EMPR, SUBSTATIONS

20.3 GENERIC EMPR, OVERHEAD LINES

21 APPENDIX H: PPP DOCUMENTATION

21.1 ADVERTISEMENTS (X2), INITIAL

Two adverts were placed in the Daily Disptach on the 14th of November 2022. Please see below for proofs of the English version and of the isiXhosa version.



CES

NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED NGXWABANGU WIND ENERGY FACILITY (WEF) AND ASSOCIATED INFRASTRUCTURE WITHIN THE INTSIKA YETHU LOCAL MUNICIPALITY, EASTERN CAPE PROVINCE

Notice is hereby given in terms of Regulation 41(2) published in Government Notice No. 982 under Chapter 6 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) Environmental Impact Assessment (EIA) Regulations (2014, as amended) of the intention to submit an Application for Environmental Authorisation (EA) for the proposed development of the 260 MW Ngxwabangu Wind Energy Facility (WEF) and associated infrastructure, including the development of a Battery Energy Storage System (BESS), situated north of Cofimvaba in the Eastern Cape Province.

Ngxwabangu Wind Power (Pty) Ltd., a subsidiary of EDF Renewables South Africa (Pty) Ltd, plans to develop, construct and operate a WEF approximately 15 km North of Cofimvaba in the Eastern Cape Province. The project site is situated on Farm 66, Remaining Extent (RE) of Farm 95, RE of Farm 101, Farm 123, Farm 184, Farm 170, Farm 98, RE of Farm 92, RE of Farm 93, Farm 181, RE of Farm 183, RE of Farm 188 and Ngonyama Allotment Area. The affected properties are situated within Wards 16, 19, 20 and 21 in the Intsika Yethu Local Municipality (LM) which forms part of the Chris Hani District Municipality (DM). The proposed Ngxwabangu WEF is situated within the Stormberg Renewable Energy Development Zone (REDZ4) which was promulgated in GN R. 640 for large scale wind and solar photovoltaic energy facilities.

The proposed Ngxwabangu WEF will consist of up to 60 turbines, with a total facility output of up to 260MW. The WEF will also include up to four (4) 33kV medium voltage internal collector substations (SS), two (2) 33kV medium voltage underground powerlines of up to 6km and 9km in length (two alternatives), an IPP SS (two alternatives) which will include a 33kV/132kV Switching Station area in order to connect the WEF to the existing Eskom Substation via a 132kV OHL (this will be applied for in a separate environmental application). The WEF will also include a BESS (two alternatives), temporary and permanent laydown areas, a Concrete Tower Manufacturing Facility (CTMF), a Construction Compound (CC), and access roads. It is proposed that the temporary laydown area, the CTMF and the Construction Compound areas be used as the BESS footprint post-construction phase. The construction footprint of the proposed WEF will be up to 215 ha (inclusive of roads), rehabilitated to an operational footprint of up to 125 ha (inclusive of roads).

The proposed development triggers NEMA (Act No. 107 of 1998, as amended) EIA Regulations (2014, as amended) Listing Notice 1, 2 and 3 activities. The entire proposed development site is situated within a Renewable Energy Development Zone (REDZ), in terms of Government Notice No. 114 in Government Gazette No. 41445, which identified eight (8) REDZ which are important for the development of large scale wind and solar photovoltaic facilities and therefore requires a Basic Assessment Process.

The proposed development will require Water Use Authorisation in accordance with the following sections of the National Water Act (NWA) (Act No. 36 of 1998, as amended): Section 21(a) – Taking water from a water resource, Section 21(c) – Impeding or diverting the flow of water in a watercourse, Section 21(i) – Altering the bed, banks, course, or characteristics of a watercourse, and either Section 21(g) – Disposing of waste in manner that may detrimentally impact a water resource, or Section 21(e) – Engaging in a controlled activity. The Water Use Application will be submitted to the Department of Water and Sanitation (DWS) via the Electronic Water Use Licence Application and Authorisation System (e-WULAAS).

Coastal and Environmental Services (Pty) Ltd, trading as "CES", have been appointed to undertake the required Basic Assessment Process. The Competent Authority for this Application for EA is the national Department of Forestry, Fisheries and the Environment (DFFE).

For more information, registration as an Interested and/or Affected Party (I&AP) or submission of written comments, please contact: Ms Louise Van Aardt via post, phone or email: P.O. Box 934, Makhanda (Grahamstown), 6140 | Tel: +27 (0)46 622 2364 | Email: nepp@conner.co.za

* Remember to include the project reference in all correspondence: Ngxwabangu WEF.

Please note that an SMS notification will also be sent out to all registered I&APs and you can also submit written comments by responding to the SMS notification.

NOTICE: POPIA (Protection of Personal Information Act) Disclaimer. All Stakeholder and I&AP Databases need to adhere to the Act from the 1st of July 2021. Should you wish to register as an I&AP on the Stakeholder and I&AP Database, as the administrators of the Ngxwabangu Stakeholder and I&AP Database we require your consent to be part of this database. As such you are herewith notified that you are entitled to refuse such consent and you may exercise such a right by withdrawing from this database in writing at any stage of the process. Should you elect to remain in this group, it will be accepted that you have consented to being a part of this database and to your personal information (being your name, affiliation, contact details and written comments) being noticeable to any person interested in this project and in the public domain. In this regard, we implore all members of this database NOT to make use of such personal information for whatsoever reason without obtaining the consent from the relevant person(s).

CES

ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

ISAZISO NGESICELO SOGUNYAZISO LOKUSINGQONGILEYO ULUMAYELANA NOKUCETYWA KOKWAKHIWA KWESITISHI SASE-NGXWABANGU ESIPHEHLA UMBANE NGOMOYA (NGXWABANGU WIND ENERGY FACILITY) KUNYE NEZISEKO EZINGUNDOQO EZINXULUMENE NOKUPHEHLA UMBANE NGOMOYA, PHANTSI KOMASIPALA WENGINGQI YE-NSTIKA YETHU, KWI-PHONDO LWEMPUMA KOLONI

Isaziso sinikezelwa ngokoMmiselo wama-41(2) opapashwe kwiSaziso sikaRhulumente esinguNombolo 982 phantsi kweSahluko sesi-6 soMthetho woLawulo lokuSingqongileyo kuZwelonke (NEMA) (uMthetho onguNombolo 107 ka-1998, njengoko ulungisiwe) iMimiselo yoVavanyo lweMpembelelo yokuSingqongileyo (EIA) (2014, njengoko ilungisiwe) ngenjongo yokungenisa iSicelo soGunyaziso lokusiNgqongileyo (EA) sophuhliso olucetywayo lwe-260 MW Ngxwabangu Wind Energy Facility (isitishi esiphehla umbane ngomoya), kunye neziseko ezingundoqo ezinxulumene nokuphehla umbane ngomoya, kubandakanywa nophuhliso lweNkqubo yokuGcina amandla wombane kwiBetri (Battery Energy Storage System), iprojekthi ime kumntla weCofimvaba kwiPhondo leMpuma Koloni.

I-Ngxwabangu Wind Power (Pty) Ltd., isebe le-EDF Renewables South Africa (Pty) Ltd yenza isindululo sophuhliso kwi 15 km kumntla weCofimvaba kwiPhondo leMpuma Koloni. Il-projecti ikhankanywe kwiFama 66, iNxalenye eNgqongileyo (RE) yeFama 95, RE yeFama 101, iFama 123, iFama 164, iFama 170, iFama 98, iRE yeFama 92, RE yeFama. 93, iFama 181, RE yeFama 183, iRE yeFama 188 kunye neNdawo yeSabelo saseNgenyama. Imihlaba echaphazelekayo iquka uWadi 16, 19, 20 no-21 kuMasipala waseKhaya Intsika Yethu, kuMasipala weSithili saseChris Hani. Iprojekhti ime kwi 15 km kumntla weCofimvaba kuMmandla wePhuhliso lwaMandla aHlaziyekayo eStormberg (REDZ4) eyabhengezwa kwi-GN R. 840 osekelwe kuphuhliso lomoya omkhulu kunye nezixhobo zelanga.

Uluphuhliso lucetywayo lwe Ngxwabangu Wind Energy Facility (isitishi esiphehla umbane ngomoya) zine turbines ezingama-50, ezinemveliso yamandla ewonke ukuya kuma-260MW. Esi sitishi sizokubandakanya ukuya kuthi ga kwizitishi zombane ophakathi ezine (4) 33kV (medium voltage internal collector substations) (SS), ezimbini (2) 33KV ombane ophakathi osebenzisa intambo zangaphantsi komhlaba ofikelela kwi-6km kunye ne-9km ubude, izitishi ezimbini ezincinci zabavelisi abazimeleyo (IPP SS) eziya kubandakanya 33kV/132kV yesiKhululo soshintsho ukuze kudityaniswe i-WEF neSikhululo esikhoyo sika-Eskom nge-132kV OHL (oku kuya kufakwa kwisicelo esahlukileyo lokusiNgqongileyo), kunye neziseko ezingundoqo ezinxulumene nokuphehla umbane ngomoya. Kubandakanywa nophuhliso lweNkqubo yokuGcina amandla wombane kwiBetri (Battery Energy Storage System), iindawo zokubeka okwethutyana nezisisigcina, iConcrete Tower Manufacturing Facility (CTMF), iCompound Construction (CC), kunye neendlela zokungena. Ushicilelo lwenyawo lokwakhiwa kwe Ngxabangu Wind Farm Energy liya kuthatha iihektare (ha) eziya kuma -215 kuquka neendlela, ihlaziywe ibuyele kwisimo sangaphambili ukuya kuthi ga kwi-125 hektare (ha) kuquka neendlela.

Uphuhliso olucetywayo luxhokonxa iNEMA (uMthetho onguNombolo 107 ka-1998, njengoko ulungisiwe) iMimiselo ye-EIA (2014, njengoko ilungisiwe) imisebenzi yeSaziso soLuhlu 1, 2 no-3. Sonke isiza sophuhliso esicetywayo sime ngaphakathi kuMmandla wePhuhliso lwaMandla aHlaziyekayo (Renewable Eenergy Development Zone), ngokwemiqathango yeSaziso sikaRhulumente esinguNombolo 114 kwiGazethi kaRhulumente enguNombolo 41445, echonge iREDZ ezisibhozo (8) ezibalulekileyo kuphuhliso lomoya omkhulu kunye nezixhobo zelanga photovoltaic. Uphuhliso olucetywayo luphakathi kweStormberg REDZ 4 kwaye ke ngoko lufuna iNkqubo yoVavanyo oluSisiseko.

Uphuhliso olucetywayo luya kufuna uGunyaziso lokuSetyenziswa kwaManzi ngokuhambelana nala macandelo alandelayo oMthetho waManzi weSizwe (NWA) (uMthetho onguNombolo 36 ka-1998, njengoko ulungisiwe): iCandelo 21(a) – Ukuthabatha amanzi kumthombo wamanzi, iCandelo 21(c) – Ukuthintela okanye ukuphambukisa ukuhamba kwamanzi kumlambo, iCandelo 21(i) – Ukutshintsha ibhedi, iibhanki, indlela, okanye iimpawu zomlambo, kunye nokuba iiCandelo lama-21(g) – ukulahlwa kwenkunkuma ngendlela enokonakalisa. ukuchaphazela ubutyebi bamanzi, okanye iCandelo lama-21(e) – Ukubandakanyeka kumsebenzi olawulwayo. Isicelo sokuSetyenziswa kwaManzi siya kungeniswa kwiSebe lezaManzi noGutyulo (i-DWS) kusetyenziswa iSicelo seLayisensi yoSetyenziso lwaManzi ngeKhompyutha kunye neNkqubo yoGunyaziso (e-WULAAS).

iCoastal and Environmental Services (Pty) Ltd, ebizwa njenge-"CES", yonyulwe ukuba iqhube iNkqubo yoVavanyo oluSisiseko olufunekayo. Igunyabantu elinobuchule kwesi sicelo se-EA liSebe leSizwe lamaHlathi, ezokuLoba nokusiNgqongileyo (DFFE).

Ngolwazi oluthe kratya, ukubhaliswa njengeQela elinomdla kunye/okanye eliChaphazelekayo (I&AP) okanye ukungeniswa kwezimvo ezibhaliweyo, nceda uqhagamshelane no-Ms Louise Van Aardt nge posi, ifowni okanye i-imeyili: P.O. Box 934, Makhanda (Grahamstown), 6140 | Umnxeba: +27 (0)46 622 2364 | I-imeyili: reppp@cesnet.co.za. * Khumbula ukubandakanya ireferensi yeprojekthi kuyo yonke imbalelwano: Isitishi sase-Ngxwabangu Esiphehla Umbane Ngomoya.

Nceda uqaphele ukuba isaziso seSMS siya kuthunyelwa kuwo onke ama-I&AP (abobachaphazelekayo yiprojekthi) abhalisiweyo kwaye unokungenisa izimvo ezibhaliweyo ngokuphendula kwisaziso seSMS.

ISAZISO I-POPIA (uMthetho woKhuseleko loLwazi loBuqu) I-Disclaimer. Bonke abachaphazelekayo kunye noovimba beenkcukacha ze I&AP kufuneka babambelele kuMthethoukususela ngomhla woku-1 kuJulayi 2021. Ukuba unqwenela ukubhalisa njengeQela le-I&AP kufuhlu lweenkcukacha zabachaphazelekayo kunye ne-I&AP, njengabatyaweli beNgxwabangu Stakeholder kunye ne-I&AP Database sifuna imvume yakho ukuba sibe yinxalenye. kwesi siseko sedatha. Ngaloo ndlela uyaziswa ukuba unelungelo lokwala loo mvume kwaye ungasebenzisa elo lungelo ngokurhoxa kolu vimba weenkcukacha ngembalelwano nakweliphi na inqanaba lenkqubo. Ukuba ukhetha ukuhlala kweli qela, kuya kwamkelwa ukuba uvumile ukuba yinxalenye yolu lwazi kunye neenkcukacha zakho (igama lakho, iindibanisalwano, iinkcukacha zoqhagamshelwano kunye nezimvo ezibhaliweyo) ziqapheleke kuye nawuphi na umntu onomdla kolu. iprojekthi nakwidomeyini yoluntu. Ngokubhekiselele koku, sibongoza onke amalungu alo vimba weenkcukacha ukuba ANGAZIsebenzisi ezo nkcukacha zobuqu ngaso nasiphi na isizathu ngaphandle kokufumana imvume kumntu (abantu).

show in Texas

Video clips posted on social media captured the incident as it unfolded, showing the two aircraft colliding and crashing to the ground, engulfed by flames. Scenes from live aerial video showed debris from the aircrafts scattered on a patch of browned grass at the site of the collision. — *Reuters*

CES

ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED NGXWABANGU WIND ENERGY FACILITY (WEF) AND ASSOCIATED INFRASTRUCTURE WITHIN THE INTSIKA YETHU LOCAL MUNICIPALITY, EASTERN CAPE PROVINCE

Notice is hereby given in terms of Regulation 41(2) published in Government Notice No. 982 under Chapter 6 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) Environmental Impact Assessment (EIA) Regulations (2014, as amended) of the intention to submit an Application for Environmental Authorisation (EA) for the proposed development of the 260 MW Ngxwabangu Wind Energy Facility (WEF) and associated infrastructure, including the development of a Battery Energy Storage System (BESS), situated north of Cofimvaba in the Eastern Cape Province.

Ngxwabangu Wind Power (Pty) Ltd., a subsidiary of EDF Renewables South Africa (Pty) Ltd. plans to develop, construct and operate a WEF approximately 15 km North of Cofimvaba in the Eastern Cape Province. The project site is situated on Farm 66, Remaining Extent (RE) of Farm 95, RE of Farm 101, Farm 123, Farm 184, Farm 170, Farm 98, RE of Farm 92, RE of Farm 93, Farm 181, RE of Farm 183, RE of Farm 188 and Ngonyama Allotment Area. The affected properties are situated within Wards 16, 19, 20 and 21 in the Intsika Yethu Local Municipality (LM) which forms part of the Chris Hani District Municipality (DM). The proposed Ngxwabangu WEF is situated within the Stormberg Renewable Energy Development Zone (REDZ4) which was promulgated in GN R. 840 for large scale wind and solar photovoltaic energy facilities.

The proposed Ngxwabangu WEF will consist of up to 50 turbines, with a total facility output of up to 260MW. The WEF will also include up to four (4) 33kV medium voltage internal collector substations (SS), two (2) 33kV medium voltage underground powerlines of up to 6km and 9km in length (two alternatives), an IPP SS (two alternatives) which will include a 33kV/132kV Switching Station area in order to connect the WEF to the existing Eskom Substation via a 132kV OHL (this will be applied for in a separate environmental application). The WEF will also include a BESS (two alternatives), temporary and permanent laydown areas, a Concrete Tower Manufacturing Facility (CTMF), a Construction Compound (CC), and access roads. It is proposed that the temporary laydown area, the CTMF and the Construction Compound areas be used as the BESS footprint post-construction phase. The construction footprint of the proposed WEF will be up to 215 ha (inclusive of roads), rehabilitated to an operational footprint of up to 125 ha (inclusive of roads).

The proposed development triggers NEMA (Act No. 107 of 1998, as amended) EIA Regulations (2014, as amended) Listing Notice 1, 2 and 3 activities. The entire proposed development site is situated within a Renewable Energy Development Zone (REDZ), in terms of Government Notice No. 114 in Government Gazette No. 41445, which identified eight (8) REDZ which are important for the development of large scale wind and solar photovoltaic facilities and therefore requires a Basic Assessment Process.

The proposed development will require Water Use Authorisation in accordance with the following sections of the National Water Act (NWA) (Act No. 36 of 1998, as amended): Section 21(a) – Taking water from a water resource, Section 21(c) – Impeding or diverting the flow of water in a watercourse, Section 21(i) – Altering the bed, banks, course, or characteristics of a watercourse, and either Section 21(g) – Disposing of waste in manner that may detrimentally impact a water resource, or Section 21(e) – Engaging in a controlled activity. The Water Use Application will be submitted to the Department of Water and Sanitation (DWS) via the Electronic Water Use Licence Application and Authorisation System (e-WULAAS).

Coastal and Environmental Services (Pty) Ltd, trading as "CES", have been appointed to undertake the required Basic Assessment Process. The Competent Authority for this Application for EA is the national Department of Forestry, Fisheries and the Environment (DFFE).

For more information, registration as an Interested and/or Affected Party (I&AP) or submission of written comments, please contact Ms Louise Van Aardt via post, phone or email: P.O. Box 934, Makhanda (Grahamstown), 6140 | Tel: +27 (0)46 622 2364 | Email: reppp@cesnet.co.za

* Remember to include the project reference in all correspondence: Ngxwabangu WEF.

Please note that an SMS notification will also be sent out to all registered I&APs and you can also submit written comments by responding to the SMS notification.

NOTICE: POPIA (Protection of Personal Information Act) Disclaimer. All Stakeholder and I&AP Databases need to adhere to the Act from the 1st of July 2021. Should you wish to register as an I&AP on the Stakeholder and I&AP Database, as the administrators of the Ngxwabangu Stakeholder and I&AP Database we require your consent to be part of this database. As such you are herewith notified that you are entitled to refuse such consent and you may exercise such a right by withdrawing from this database in writing at any stage of the process. Should you elect to remain in this group, it will be accepted that you have consented to being a part of this database and to your personal information (being your name, affiliation, contact details and written comments) being noticeable to any person interested in this project and in the public domain. In this regard, we implore all members of this database NOT to make use of such personal information for whatsoever reason without obtaining the consent from the relevant person(s).

CES

ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

ISAZISO NGESICELO SOGUNYAZISO LOKUSINGQONGILEYO ULUMAYELANA NOKUCETYWA KOKWAKHIWA KWESITISHI SASE-NGXWABANGU ESIPHEHLA UMBANE NGOMOYA (NGXWABANGU WIND ENERGY FACILITY) KUNYE NEZISEKO EZINGUNDOQO EZINXULUMENE NOKUPHEHLA UMBANE NGOMOYA, PHANTSI KOMASIPALA WENGINGQI YE-NSTIKA YETHU, KWI-PHONDO LWEMPUMA KOLONI

Isaziso sinikezelwa ngokoMmiselo wama-41(2) opapashwe kwiSaziso sikaRhulumente esinguNombolo 982 phantsi kweSahluko sesi-6 soMthetho woLawulo lokuSingqongileyo kuZwelonke (NEMA) (uMthetho onguNombolo 107 ka-1998, njengoko ulungisiwe) iMimiselo yoVavanyo lweMpembelelo yokuSingqongileyo (EIA) (2014, njengoko ilungisiwe) ngenjongo yokungenisa iSicelo soGunyaziso lokusiNgqongileyo (EA) sophuhliso olucetywayo lwe-260 MW Ngxwabangu Wind Energy Facility (isitishi esiphehla umbane ngomoya), kunye neziseko ezingundoqo ezinxulumene nokuphehla umbane ngomoya, kubandakanywa nophuhliso lweNkqubo yokuGcina amandla wombane kwiBetri (Battery Energy Storage System), iprojekhti ime kumntla weCofimvaba kwiPhondo leMpuma Koloni.

I-Ngxwabangu Wind Power (Pty) Ltd., isebe le-EDF Renewables South Africa (Pty) Ltd yenza isindululo sophuhliso kwi 15 km kumntla weCofimvaba kwiPhondo leMpuma Koloni. Il-projecti ikhankanywe kwiFama 66, iNxalenye eNgqongileyo (RE) yeFama 95, RE yeFama 101, iFama 123, iFama 184, iFama 170, iFama 98, iRE yeFama 92, RE yeFama. 93, iFama 181, RE yeFama 183, iRE yeFama 188 kunye neNdawo yeSabelo saseNgonyama. Imihlaba echaphazelekayo iquka uWadi 16, 19, 20 no-21 kuMasipala waseKhaya Intsika Yethu, kuMasipala weSithili saseChris Hani. Iprojekhti ime kwi 15 km kumntla weCofimvaba kuMmandla woPhuhliso lwaMandla aVuselelekayo eStormberg (REDZ4) ayabhengazwa kwi-GN R. 840 oselelwe kuphuhliso lomoya omkhulu kunye nezixhobo zelanga.

Uluphuhliso lucetywayo lwe Ngxwabangu Wind Energy Facility (isitishi esiphehla umbane ngomoya) zine turbines ezingama-50, ezinemveliso yamandla ewonke ukuya kuma-260MW. Esi sitishi sizakubandakanya ukuya kuthi ga kwizitishi zombane ophakathi ezine (4) 33kV (medium voltage internal collector substations) (SS), ezimbini (2) 33kV ombane ophakathi osebenzisa intambo zangaphantsi komhlaba ofikelela kwi-6km kunye ne-9km ubude, izitishi ezimbini ezincinci zabavelisi abazimeleyo (IPP SS) eziya kubandakanya 33kV/132kV yesiKhululo soshintsho ukuze kudityaniswe i-WEF neSikhululo esikhoyo sika-Eskom nge-132kV OHL (oku kuya kufakwa kwisicelo esahlukileyo lokusiNgqongileyo), kunye neziseko ezingundoqo ezinxulumene nokuphehla umbane ngomoya. Kubandakanywa nophuhliso lweNkqubo yokuGcina amandla wombane kwiBetri (Battery Energy Storage System), iindawo zokubeka okwethutyana nezisisigxina, iConcrete Tower Manufacturing Facility (CTMF), iCompound Construction (CC), kunye neendlela zokungena. Ushicilelo lwenyawo lokwakhiwa kwe Ngxabangu Wind Farm Energy liya kuthatha iihektare (ha) eziya kuma -215 kuquka neendlela, ihlaziywe ibuyele kwisimo sangaphambili ukuya kuthi ga kwi-125 hektare (ha) kuquka neendlela.

Uphuhliso olucetywayo luxhokonxa iNEMA (uMthetho onguNombolo 107 ka-1998, njengoko ulungisiwe) iMimiselo ye-EIA (2014, njengoko ilungisiwe) imisebenzi yeSaziso soLuhlu 1, 2 no-3. Sonke isiza sophuhliso esicetywayo sime ngaphakathi kuMmandla woPhuhliso lwaMandla aVuselelekayo (Renewable Eenergy Development Zone), ngokwemiqathango yeSaziso sikaRhulumente esinguNombolo 114 kwiGazethi kaRhulumente enguNombolo 41445, echonge iREDZ ezisibhozo (8) ezibalulekileyo kuphuhliso lomoya omkhulu kunye nezixhobo zelanga photovoltaic. Uphuhliso olucetywayo luphakathi kweStormberg REDZ 4 kwaye ke ngoko lufuna iNkqubo yoVavanyo oluSisiseko.

Uphuhliso olucetywayo luya kufuna uGunyaziso lokuSetyenziswa kwaManzi ngokuhambelana nala macandelo alandelayo oMthetho waManzi weSizwe (NWA) (uMthetho onguNombolo 36 ka-1998, njengoko ulungisiwe): iCandelo 21(a) – Ukuthabatha amanzi kumthombo wamanzi, iCandelo 21(c) – Ukuthintela okanye ukuphambukisa ukuhamba kwamanzi kumlambo, iCandelo 21(i) – Ukutshintsha ibhedi, iibhanki, indlela, okanye iimpawu zomlambo, kunye nokuba iiCandelo lama-21(g) – ukulahlwa kwenkunkuma ngendlela enokonakalisa. ukuchaphazela ubutyebi bamanzi, okanye iCandelo lama-21(e) – Ukubandakanyeka kumsebenzi olawulwayo. Isicelo sokuSetyenziswa kwaManzi siya kungeniswa kwiSebe lezaManzi noGutyulo (i-DWS) kusetyenziswa iSicelo seLayisensi yoSetyenziso lwaManzi ngeKhompyutha kunye neNkqubo yoGunyaziso (e-WULAAS).

ICoastal and Environmental Services (Pty) Ltd, erhweba njenge-"CES", yonyulwe ukuba iqhube iNkqubo yoVavanyo oluSisiseko olufunekayo. Igunyabantu elinobuchule kwesi sicelo se-EA iiSebe lesizwe lamaHlathi, ezokuLoba nokusiNgqongileyo (DFFE).

Ngolwazi oluthe kratya, ukubhaliswa njengeQela elinomdla kunye/okanye eliChaphazelekayo (I&AP) okanye ukungeniswa kwezimvo ezibhaliweyo, nceda uqhagamshelane no-Ms Louise Van Aardt nge posi, ifowni okanye i-imeyili: P.O. Box 934, Makhanda (Grahamstown), 6140 | Umnxeba: +27 (0)46 622 2364 | I-imeyili: reppp@cesnet.co.za. * Khumbula ukubandakanya ireferensi yeprojekhi kuyo yonke imbalelwano: Isitishi sase-Ngxwabangu Esiphehla Umbane Ngomoya.

Nceda uqaphele ukuba isaziso seSMS siya kuthunyelwa kuwo onke ama-I&AP (abobachaphazelekayo yiprojekthi) abhalisiweyo kwaye unokungenisa izimvo ezibhaliweyo ngokuphendula kwisaziso seSMS.

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21.2 ADVERTISEMENTS (X2), BASIC ASSESSMENT

Two adverts were placed in the Daily Disptach on the 15th of May 2023. Please see below for proofs of the English version and of the isiXhosa version.

CES

ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED NGXWABANGU WIND ENERGY FACILITY (WEF) AND ASSOCIATED INFRASTRUCTURE WITHIN THE INTSIKA YETHU LOCAL MUNICIPALITY, EASTERN CAPE PROVINCE

Notice is hereby given in terms of Regulation 41(2) published in Government Notice No. 982 under Chapter 6 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) Environmental Impact Assessment (EIA) Regulations (2014, as amended) of the intention to submit an Application for Environmental Authorisation (EA) for the proposed development of the 260 MW Ngxwabangu Wind Energy Facility (WEF) and associated infrastructure, including the development of a Battery Energy Storage System (BESS), situated north of Cofimvaba in the Eastern Cape Province.

Ngxwabangu Wind Power (Pty) Ltd., a subsidiary of EDF Renewables South Africa (Pty) Ltd. plans to develop, construct and operate a WEF approximately 15 km North of Cofimvaba in the Eastern Cape Province. The project site is situated on Farm 66, Remaining Extent (RE) of Farm 95, RE of Farm 101, Farm 123, Farm 184, Farm 170, Farm 98, RE of Farm 92, RE of Farm 93, Farm 181, RE of Farm 183, RE of Farm 188 and Ngonyama Allotment Area. The affected properties are situated within Wards 16, 19, 20 and 21 in the Intsika Yethu Local Municipality (LM) which forms part of the Chris Hani District Municipality (DM). The proposed Ngxwabangu WEF is situated within the Stormberg Renewable Energy Development Zone (REDZ4) which was promulgated in GN R. 840 for large scale wind and solar photovoltaic energy facilities.

The proposed Ngxwabangu WEF will consist of up to 36 turbines, with a total facility output of up to 260MW. The WEF will also include up to four (4) 33kV medium voltage internal collector substations (SS), two (2) 33kV medium voltage underground powerlines of up to 6km and 9km in length (two alternatives), one (1) 33kv overhead powerline of up to 12km, an IPP SS (two alternatives) which will include a 33kV/132kV Switching Station area in order to connect the WEF to the existing Eskom Substation via a 132kV OHL of up to 20km (four alternatives are being considered)). The WEF will also include a BESS (two alternatives), temporary and permanent laydown areas, a Concrete Tower Manufacturing Facility (CTMF), a Construction Compound (CC), and access roads. The construction footprint of the proposed WEF will be up to 209 ha (inclusive of roads), rehabilitated to an operational footprint of up to 118 ha (inclusive of roads).

The proposed development triggers NEMA (Act No. 107 of 1998, as amended) EIA Regulations (2014, as amended) Listing Notice 1, 2 and 3 activities. The entire proposed development site is situated within a Renewable Energy Development Zone (REDZ), in terms of Government Notice No. 114 in Government Gazette No. 41445, which identified eight (8) REDZ which are important for the development of large scale wind and solar photovoltaic facilities and therefore requires a Basic Assessment Process.

The proposed development will require Water Use Authorisation in accordance with the following sections of the National Water Act (NWA) (Act No. 36 of 1998, as amended): Section 21(a) – Taking water from a water resource, Section 21(c) – Impeding or diverting the flow of water in a watercourse, Section 21(i) – Altering the bed, banks, course, or characteristics of a watercourse, and either Section 21(g) – Disposing of waste in manner that may detrimentally impact a water resource, or Section 21(e) – Engaging in a controlled activity. The Water Use Application will be submitted to the Department of Water and Sanitation (DWS) via the Electronic Water Use Licence Application and Authorisation System (e-WULAAS).

Coastal and Environmental Services (Pty) Ltd, trading as "CES", have been appointed to undertake the required Basic Assessment Process. The Competent Authority for this Application for EA is the national Department of Forestry, Fisheries and the Environment (DFFE).

For more information, registration as an Interested and/or Affected Party (I&AP) or submission of written comments, please contact Ms Louise Van Aardt via post, phone or email: P.O. Box 934, Makhanda (Grahamstown), 6140 I Tel: +27 (0)46 622 2364 I Email: reppp@cesnet.co.za

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ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

ISAZISO NGESICELO SOGUNYAZISO LOKUSINGQONGILEYO ULUMAYELANA NOKUCETYWA KOKWAKHIWA KWESITISHI SASE-NGXWABANGU ESIPHEHLA UMBANE NGOMOYA (NGXWABANGU WIND ENERGY FACILITY) KUNYE NEZISEKO EZINGUNDOQO EZINXULUMENE NOKUPHEHLA UMBANE NGOMOYA, PHANTSI KOMASIPALA WENGINGQI YE-NSTIKA YETHU, KWI-PHONDO LWEMPUMA KOLONI

Isaziso sinikezelwa ngokoMmiselo wama-41(2) opapashwe kwiSaziso sikaRhulumente esinguNombolo 982 phantsi kweSahluko sesi-6 soMthetho woLawulo lokuSingqongileyo kuZwelonke (NEMA) (uMthetho onguNombolo 107 ka-1998, njengoko ulungisiwe) iMimiselo yoVavanyo lweMpembelelo yokuSingqongileyo (EIA) (2014, njengoko ilungisiwe) ngenjongo yokungenisa iSicelo soGunyaziso lokusiNgqongileyo (EA) sophuhliso olucetywayo lwe-260 MW Ngxwabangu Wind Energy Facility (isitishi esiphehla umbane ngomoya), kunye neziseko ezingundoqo ezinxulumene nokuphehla umbane ngomoya, kubandakanywa nophuhliso lweNkqubo yokuGcina amandla wombane kwiBetri (Battery Energy Storage System), iprojekhti ime kumntla weCofimvaba kwiPhondo leMpuma Koloni.

I-Ngxwabangu Wind Power (Pty) Ltd., isebe le-EDF Renewables South Africa (Pty) Ltd yenza isindululo sophuhliso kwi 15 km kumntla weCofimvaba kwiPhondo leMpuma Koloni. I-projecti ikhankanywe kwiFama 66, iNxalenye eNgqongileyo (RE) yeFama 95, RE yeFama 101, iFama 123, iFama 184, iFama 170, iFama 98, iRE yeFama 92, RE yeFama. 93, iFama 181, RE yeFama 183, iRE yeFama 188 kunye neNdawo yeSabelo saseNgonyama. Imihlaba echaphazelekayo iquka uWadi 16, 19, 20 no-21 kuMasipala waseKhaya Intsika Yethu, kuMasipala weSithili saseChris Hani. Iprojekhti ime kwi 15 km kumntla weCofimvaba kuMmandla woPhuhliso lwaMandla aVuselekayo eStormberg (REDZ4) eyabhengezwa kwi-GN R. 840 osekelwe kuphuhliso lomoya omkhulu kunye nezixhobo zelanga.

Uluphuhliso lucetywayo lwe Ngxwabangu Wind Energy Facility (isitishi esiphehla umbane ngomoya) zine turbines ezingama-36, ezinemveliso yamandla ewonke ukuya kuma-260MW. Esi sitishi sizokubandakanya ukuya kuthi ga kwizitishi zombane ophakathi ezine (4) 33kV (medium voltage internal collector substations) (SS), ezimbini (2) 33kV ombane ophakathi osebenzisa intambo zangaphantsi komhlaba ofikelela kwi-6km kunye ne-9km ubude (ezimbini ezizezinye) enye (1) 33kv ombane osebenzisa intambo ehamba ngaphezulu ofikelela kwi 12km ngobude, i-IPP SS (ezimbini ezizezinye) eziya kubandakanya indawo yesiKhululo sokuTshintsho se-33kV/132kV ukuze kudityaniswe i-WEF kwisiKhululo esikhoyo sika-Eskom nge-132kV OHL ukuya kuma-20km (ezine ezinye iindlela ziyaqwalaselwa)) Kubandakanywa nophuhliso lweNkqubo yokuGcina amandla wombane kwiBetri (Battery Energy Storage System), iindawo zokubeka okwethutyana nezisisigxina, iConcrete Tower Manufacturing Facility (CTMF), iCompound Construction (CC), kunye neendlela zokungena. Ushicilelo lwenyawo lokwakhiwa kwe Ngxabangu Wind Farm Energy liya kuthatha iihektare (ha) eziya kuma -209 kuquka neendlela, ihlaziywe ibuyele kwisimo sangaphambili ukuya kuthi ga kwi-118 hektare (ha) kuquka neendlela.

Uphuhliso olucetywayo luxhokonxa iNEMA (uMthetho onguNombolo 107 ka-1998, njengoko ulungisiwe) iMimiselo ye-EIA (2014, njengoko ilungisiwe) imisebenzi yeSaziso soLuhlu 1, 2 no-3. Sonke isiza sophuhliso esicetywayo sime ngaphakathi kuMmandla woPhuhliso lwaMandla aVuselelekayo (Renewable Eenergy Development Zone), ngokwemiqathango yeSaziso sikaRhulumente esinguNombolo 114 kwiGazethi kaRhulumente enguNombolo 41445, echonge iREDZ ezisibhozo (8) ezibalulekileyo kuphuhliso lomoya omkhulu kunye nezixhobo zelanga photovoltaic, kwaye ke ngoko lufuna iNkqubo yoVavanyo oluSisiseko (Basic Assessment Process).

Uphuhliso olucetywayo luya kufuna uGunyaziso lokuSetyenziswa kwaManzi ngokuhambelana nala macandelo alandelayo oMthetho waManzi weSizwe (NWA) (uMthetho onguNombolo 36 ka-1998, njengoko ulungisiwe): iCandelo 21(a) – Ukuthabatha amanzi kumthombo wamanzi, iCandelo 21(c) – Ukuthintela okanye ukuphambukisa ukuhamba kwamanzi kumlambo, iCandelo 21(i) – Ukutshintsha ibhedi, iibhanki, indlela, okanye iimpawu zomlambo, kunye nokuba liCandelo lama-21(g) – ukulahlwa kwenkunkuma ngendlela enokonakalisa. ukuchaphazela ubutyebi bamanzi, okanye iCandelo lama-21(e) – Ukubandakanyeka kumsebenzi olawulwayo. Isicelo sokuSetyenziswa kwaManzi siya kungeniswa kwiSebe lezaManzi noGutyulo (i-DWS) kusetyenziswa iSicelo seLayisensi yoSetyenziso lwaManzi ngeKhompyutha kunye neNkqubo yoGunyaziso (e-WULAAS).

ICoastal and Environmental Services (Pty) Ltd, erhweba njenge-"CES", yonyulwe ukuba iqhube iNkqubo yoVavanyo oluSisiseko olufunekayo. Igunyabantu elinobuchule kwesi sicelo se-EA liSebe lesizwe lamaHlathi, ezokuLoba nokusiNgqongileyo (DFFE).

Ngolwazi oluthe kratya, ukubhaliswa njengeQela elinomdla kunye/okanye eliChaphazelekayo (I&AP) okanye ukungeniswa kwezimvo ezibhaliweyo, nceda uqhagamshelane no-Ms Louise Van Aardt nge posi, ifowni okanye i-imeyili: P.O. Box 934, Makhanda (Grahamstown), 6140 I Umnxeba: +27 (0)46 622 2364 I I-imeyili: reppp@cesnet.co.za * Khumbula ukubandakanya ireferensi yeprojekthi kuyo yonke imbalelwano: Isitishi sase-Ngxwabangu Esiphehla Umbane Ngomoya.

Nceda uqaphele ukuba isaziso seSMS siya kuthunyelwa kuwo onke ama-I&AP (abobachaphazelekayo yiprojekthi) abhalisiweyo kwaye unokungenisa izimvo ezibhaliweyo ngokuphendula kwisaziso seSMS.

DEATHS

USED CAR SALES

LEGAL NOTICES

2010 JEEP WRANGLER RUBICON 3.7L V6 FULL REMI CONVERSION R599 995 CALL SIPHO

PERSONAL

Classified ADVERTISING DEADLINES

LOANS & FINANCE

ACCOMMODATION OFFERED / WANTED

ROOMS WANTED / TO LET

FLATS TO LET

USED CAR SALES

FORM JJJ LOST OR DESTROYED DEED

Tried. Trusted. Targeted.

Let us help you reach the markets you need to in order to INCREASE YOUR BUSINESS SUCCESS

WARNING

CONDITIONS OF ACCEPTANCE

MAXIMISE YOUR REVENUE with targeted advertising

DailyDispatch

Arteta apologises as Arsenal's title hopes for Premier League crumble

Despondent Gunners fans leave stadium before drubbing by Brighton and Hove Albion concludes

Arsenal manager Mikel Arteta began the day still hopeful that his side could yet wrestle the Premier League title away from Manchester City but ended it apologising to the club's fans.

A 3-0 home drubbing at the hands of an excellent Brighton and Hove Albion, shortly after City dispatched Everton by the same score, all but extinguished Arsenal's dream.

It all felt hugely anticlimactic with thousands of Arsenal fans having already headed for home with Brighton 2-0 ahead thanks to second-half goals by Julio Enciso and Deniz Undav.

And when Pervis Estupinan made it 3-0 in stoppage time in front of a rapidly-emptying stadium it all felt rather embarrassing for Arsenal, who led the table for large swathes of the season but have buckled over the last six weeks.

"A week ago I was standing here feeling proud and today we have to apologise for the performance in the second half. It was not acceptable," Spaniard Arteta told Sky Sports.

"Mathematically, [the title] it's still possible, but today it's impossible to think about it.

"We need to digest the result and the performance in the second half, understand why and have a different reaction."

When Arsenal beat Leeds United 4-1 on April 1 they were eight points clear of City and in control of the title race.

Since then, however, they have managed two wins from seven games and were taken apart at City in April.

Arsenal have made huge strides this season, having come fifth last time, but a glum Arteta could find few positives after his side's second-half capitulation against Brighton.

City's win at Everton in a game which had looked like a potential banana skin for Pep Guardiola's side flattened the mood even before kick-off and Arsenal's display, especially in the second half, was arguably their worst of the season.

"[City's win] cannot be the way to justify what happened in the second half," Arteta said.

"At the moment the feeling is frustration. That we gave the game away.

"We fought really hard to be in this position and today was a critical moment to keep hoping and to keep digging for the dream.

"But you can't do what we did in the second half."

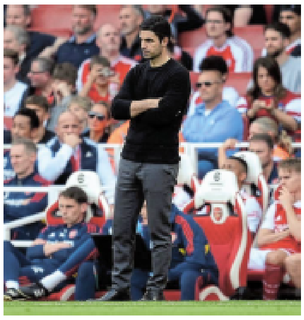
Arteta said he had a "lot to think about" over the summer as next season would see Arsenal juggling the Premier League with the demands of the Champions League.

But for now, he needs to pick his side up for next Saturday's clash at Nottingham Forest, when defeat will confirm City as champions.

Even if Arsenal win, City need only one win from their three remaining league games.

"I hate the feeling of letting people down when they are really expecting something," Arteta said.

"That's the biggest regret I have today. And we have to apologise for that." — *Reuters*



DREAM DISAPPEARING: Dejected Arsenal manager Mikel Arteta during their Premier League match against Brighton and Hove Albion on Sunday at the Emirates Stadium. Picture: GETTY IMAGES

CES

NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED NGXWABANGU WIND ENERGY FACILITY (WEF) AND ASSOCIATED INFRASTRUCTURE WITHIN THE INXUBA YETHEMBA LOCAL MUNICIPALITY, EASTERN CAPE PROVINCE

Notice is hereby given in terms of Regulation 41(3) published in Government Notice No. 982 under Chapter 5 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) Environmental Impact Assessment (EIA) Regulations (2014, as amended) of the intention to submit an Application for Environmental Authorisation (EA) for the proposed development of the 200 MW Ngxwabangu Wind Energy Facility (WEF) and associated infrastructure, including the development of a Battery Energy Storage System (BESS), situated north of Cofimvaba in the Eastern Cape Province.

Ngxwabangu Wind Power (Pty) Ltd, a subsidiary of EDF Renewables South Africa (Pty) Ltd, plans to develop, construct and operate a WEF approximately 15 km North of Cofimvaba in the Eastern Cape Province. [illegible]

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ISAZISO NGESICELO SOGUNYAZISO LOKUSINGQONGILEYO ULUMAYELANA NOKUCETYWA KOKWAKHIWA KWESITISHI SAMANDLA OMOYA ESIBIZWA NGOKUBA NGXWABANGU WIND ENERGY FACILITY [illegible]

[illegible]

Pep Guardiola praises Gundogan's leadership after brace against Everton

Another brilliant Premier League performance from Ilkay Gundogan not only led title-chasing Manchester City to a 3-0 victory over Everton on Sunday, it had manager Pep Guardiola openly making the case to keep the German midfielder.

The 32-year-old, whose contract expires in June, proved his worth once again with two excellent goals at Goodison Park after netting another brace a week ago against Leeds.

"He shows, again and again, his quality and his importance," Guardiola said. "His commitment to all of us at the club, it is not just scoring goals, he has his momentum because against Leeds he was the player and again today.

"He can do everything."

Gundogan has been linked in rumours to Barcelona.

"Nobody knows what is going to happen, maybe he stays. Hopefully," Guardiola said.

Asked if he had lobbied the club to keep him, the Spaniard replied: "Yes, I have told them."

Guardiola said his captain is not a particularly vocal leader, but "when he talks, everyone listens. This is the power of a leader. He shows leadership every training session. Arriving on time, living the job 24 hours a day. He is a guy who handles the pressure really, really well."

With three games to play, City appear unstoppable in their quest for a third consecutive Premier League title, recording their 11th win in a row on Sunday. They are also unbeaten in 22 games in all competitions. — *Reuters*

21.3 SIGNAGE (X4)


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PHAKATSI KLMASIPALA we-NGINGQI ye-NTSIKA YETHU, kwi-PHONDO LEMPUMA
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10° N
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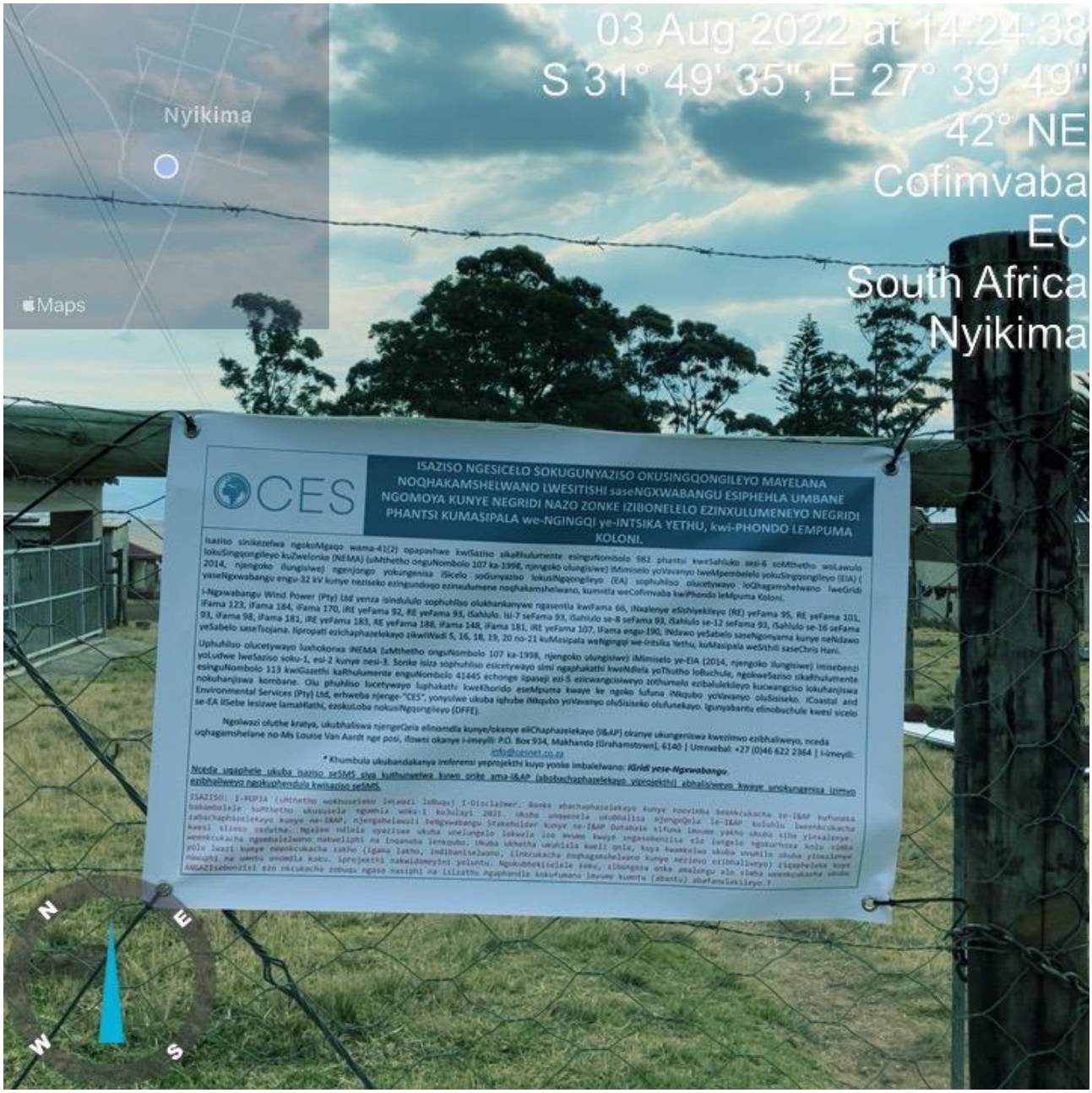
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Maps
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42° NE
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21.4 NOTIFICATIONS OF AVAILABILITY OF DRAFT BAR

This section will be updated for inclusion into the Final BAR.

21.5 PPP DATABASE

Please note that this will be updated throughout the process.

REGISTERED STAKEHOLDERS		
STAKEHOLDER	**CONTACT PERSON**	**CONTACT DETAILS**
Department of Forestry, Fisheries and the Environment (DFFE)	Mohammad Essop	
	Thobani Vetsheza (prev. DAFF)	
	Zamalanga Langa	
DFFE: Biodiversity & Conservation	Portia Makitla	
	BC Admin	
Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) (Chris Hani)	Mcedisi Makosonke	
Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) (Head Office)	Siyabonga Gqalangile	
Department of Water and Sanitation (DWS) (East London and Bloemfontein)	Lizna Fourie	
	Pius Lerotholi	
Department of Mineral Resources and Energy (East London)	Letshego Mabena	
Eskom: Renewable Energy	John Geeringh	
Eskom: Land & Rights Section	Michelle Nicol	
Chris Hani District Municipality	Gcobani Mashiyi	
	Mxolisi Koyo	
	Moppo Mene	
	Boitumelo Koloi	
	Nonelela Gobeni	
Intsika Yethu Local Municipality	*Office*	
	Dr B.J. Mthembu	
	Zamxolo Shasha	
	Koliswa Vimbayo	
	Jongumuzi Cengani	
Intsika Yethu Ward 5	Cllr. Yamile	
Intsika Yethu Ward 16	Cllr. Mto	
Intsika Yethu Ward 18	Cllr. Makade	
Intsika Yethu Ward 19	Cllr. Yamile	
Intsika Yethu Ward 20	Cllr. Ludaka	
Intsika Yethu Ward 21	Cllr. Mgqamqho	
SALGA Eastern Cape	Tebogo Mosala	
	Seana Nkhahle	
Eastern Cape Department of Human Settlements	Zanele Langa	
Department of Agriculture, Land Reform and Rural Development	Thabile Mehlomakhulu	
Eastern Cape Provincial Heritage Resources Authority (ECPHRA)	Lennox Zote	
	Sello Mokhanya	
South African Heritage Resources Agency (SAHRA)	Natasha Higgitt	
	Dumisani Sibayi	
Eastern Cape Parks and Tourism Agency (ECPTA)	Vuyani Dayimani	
	Lovinia Shaw	
Telkom	Raymond Couch	
Sentech	Alishea Viljoen	

REGISTERED STAKEHOLDERS		
STAKEHOLDER	CONTACT PERSON	CONTACT DETAILS
Vodacom	Andre Barnard	
MTN	Krishna Chetty	
Cell C	Hugo Dippenaar	
	Rudi Liebenberg	
Civil Aviation Authority (CAA)	Lizelle Stroh	
Air Traffic and Navigation Services (ATNS)	Percy Morokane	
	Carol Thomas	
Eastern Cape Department of Roads and Public Works	Thandolwethu Manda	
	Randall Moore	
South African National Roads Agency (SANRAL) - Southern Region	Danfred Adams	
BirdLife South Africa: Birds and Renewable Energy Project Manager	Samantha Ralston-Paton	
Endangered Wildlife Trust: Head of Conservation Science	Harriet Davies-Mostert	
Endangered Wildlife Trust: Wildlife & Energy Programme	Lourens Leeuwner	
VulPro	Kerri Wolter	

21.6 Issues & Response Trail

The Comments and Response Report (CRR) can be found in Appendix I of this document as a separate standalone chapter. The CRR includes all issues raised includes the EAP, Specialist and/or Applicant responses to these issues. These tables will be updated throughout the process from inception until submission of the Final BAR to the Competent Authority (DFFE).

21.7 Comments Received

This section will be updated post Draft BAR PPP.

21.8 Public Meeting Minutes

This section will be updated post Draft BAR PPP.

22 APPENDIX I: COMMENTS & RESPONSE REPORT

**** Please note that this table will be updated once the BAR PPP has been completed. Comments are captured in chronological order, with the oldest comment at the bottom of the table and the newest comment at the top of the table***