SOUTRIVIER CENTRAL WIND ENERGY FACILITY (WEF), UBUNTU LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

DFFE Reference Number: TBA

DRAFT SCOPING REPORT

PREPARED FOR:

SOUTRIVIER CENTRAL WIND ENERGY FACILITY RF (Pty) Ltd.

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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	*Project Leader & The EAP*	July 2022
Caroline Evans	*Project Manager & Lead Author*	July 2022
Bruce d'Hotman	*Co-Author*	July 2022

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THE CONTENTS OF A SCOPING REPORT

CONTENT OF THE SCOPING REPORT (APPENDIX 2, NEMA EIA REGULATIONS)		
2. (1) A scoping report must contain the information that is necessary for a proper understanding of the process, informing all alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include –		
	CONTENT	**SECTION OF THIS REPORT**
(a)	**Details of –**	
(i)	The EAP who prepared the Report.	***CHAPTER 12***
(ii)	The expertise of the EAP, including a *curriculum vitae.*	***APPENDIX 2***
(b)	**The location of the activity, including –**	
(i)	The 21-digit Surveyor General code of each cadastral land parcel.	***CHAPTER 2***
(ii)	Where available, the physical address and farm name.	
(iii)	Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	
(c)	**A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is –**	
(i)	All listed and specified activities triggered.	***CHAPTER 4***
(ii)	A description of the activities to be undertaken, including associated structures and infrastructure.	***CHAPTER 2***
(e)	**A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.**	***CHAPTER 4***
(f)	**A motivation for the need and desirability for the proposed development including the need and desirability for the activity in the context of the preferred location.**	***CHAPTER 3***
(g)	**A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including –**	
(i)	Details of all alternatives considered.	***CHAPTER 7***
(ii)	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs.	***CHAPTER 9 & APPENDIX 1***
(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.	***APPENDIX 1***
(iv)	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	***CHAPTER 5 & CHAPTER 6***
(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 8***
(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 the geographical, physical, biological, social, economic, heritage and cultural aspects.	
(viii)	The possible mitigation measures that could be applied and level of residual risk.	
(ix)	The outcome of the site selection matrix.	***CHAPTER 7***
(x)	If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such.	
(xi)	A concluding statement indicating the preferred alternatives, including preferred location of the activity.	

(h)	**A plan of study for undertaking the environmental impact assessment process to be undertaken, including –**	***CHAPTER 10***
(i)	A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.	
(ii)	A description of the aspects to be assessed as part of the environmental impact assessment process.	
(iii)	Aspects to be assessed by specialists.	
(iv)	A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists.	
(v)	A description of the proposed method of assessing duration and significance.	
(vi)	An indication of the stages at which the competent authority will be consulted.	
(vii)	Particulars of the public participation process that will be conducted during the environmental impact assessment process.	
(viii)	A description of the tasks that will be undertaken as part of the environmental impact assessment process.	
(ix)	Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	
(i)	**An undertaking under oath or affirmation by the EAP in relation to –**	***CHAPTER 12***
(i)	The correctness of the information provided in the report.	
(ii)	The inclusion of comments and inputs from stakeholders and interested and affected parties.	
(iii)	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.	
(j)	**An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.**	
(k)	**Where applicable, any specific information required by the competent authority.**	***None to date.***
(l)	**Any other matter required in terms of section 24(4)(a) and (b) of the Act.**	***None to date.***
(2) Where a government notice *gazetted* by the Minister provides for any protocol or minimum information requirement to be applied to a scoping report, the requirements as indicated in such notice will apply.		

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ENVIRONMENTAL IMPACT ASSESSMENT TEAM

Environmental Consultants	**Alan Carter,** Project Leader & The EAP *CES* **Caroline Evans,** Project Manager & Lead Author *CES* **Bruce d'Hotman,** Co-Author & GIS Mapping *CES*
Avifaunal Specialist	**Anja Albertyn,** Avifaunal Specialist *Holland & Associates Environmental Consultants*
Bat Specialist	**Jonathan Aronson,** Bat Specialist *Camissa Sustainability Consulting*
Ecological Specialist	**Jamie Pote,** Ecological Specialist *Jamie Pote Consulting*
Freshwater Specialist	**Rabia Mathakutha,** Freshwater Specialist *FEN Consulting*
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 cc*
Riverine Rabbit Specialist	**Christy Bragg,** Zoologist *Bohemian Scientist*
Socio-Economic Specialist	**Marchelle Terblanche,** Socio-economic Specialist *INDEX*
Visual Specialist	**Bryony van Niekerk,** Visual Specialist *NuLeaf Planning and Environmental*

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GENERAL SITE INFORMATION

PROJECT SPECIFICATIONS	
Name of Facility	Soutrivier Central Wind Energy Facility
Province	Northern Cape
District Municipality	Pixley Ka Seme District Municipality
Local Municipality	Ubuntu Local Municipality
Farm Numbers and Portions	RE/197 3/158 6/158
Study Area Extent (ha)	20 222 ha
Facility Footprint (ha)	***CONSTRUCTION PHASE*** Up to 125ha ***OPERATIONAL PHASE*** Up to 77ha
Vegetation Types Present	Upper Karoo Hardeveld (least threatened) and Eastern Upper Karoo (least threatened)
Specialists Studies	***MONITORING AND IMPACT ASSESSMENTS*** Avifaunal Monitoring and Impact Assessment Bat Monitoring and Impact Assessment Riverine Rabbit Monitoring and Impact Assessment ***IMPACT ASSESSMENTS*** Ecological Impact Assessment Freshwater Impact Assessment Heritage (Archaeological) Impact Assessment Noise Impact Assessment Palaeontology Impact Assessment Socio-economic Impact Assessment Visual Impact Assessment

SOUTRIVIER CENTRAL WEF DESIGN SPECIFICATIONS	
Number of turbines	Up to 32
Power output per turbine	Unspecified
Facility output	Up to 270 MW
Turbine hub height	Up to 200 m
Turbine rotor diameter	Up to 240 m
Turbine blade length	Up to 120 m
Turbine tip height	Up to 320 m
Turbine road width	14m to be rehabilitated to 8m
BESS Technology	Solid State (Li-Ion) or REDOX-Flow (High level risk assessment for both) – 10 ha / 2700 MWh

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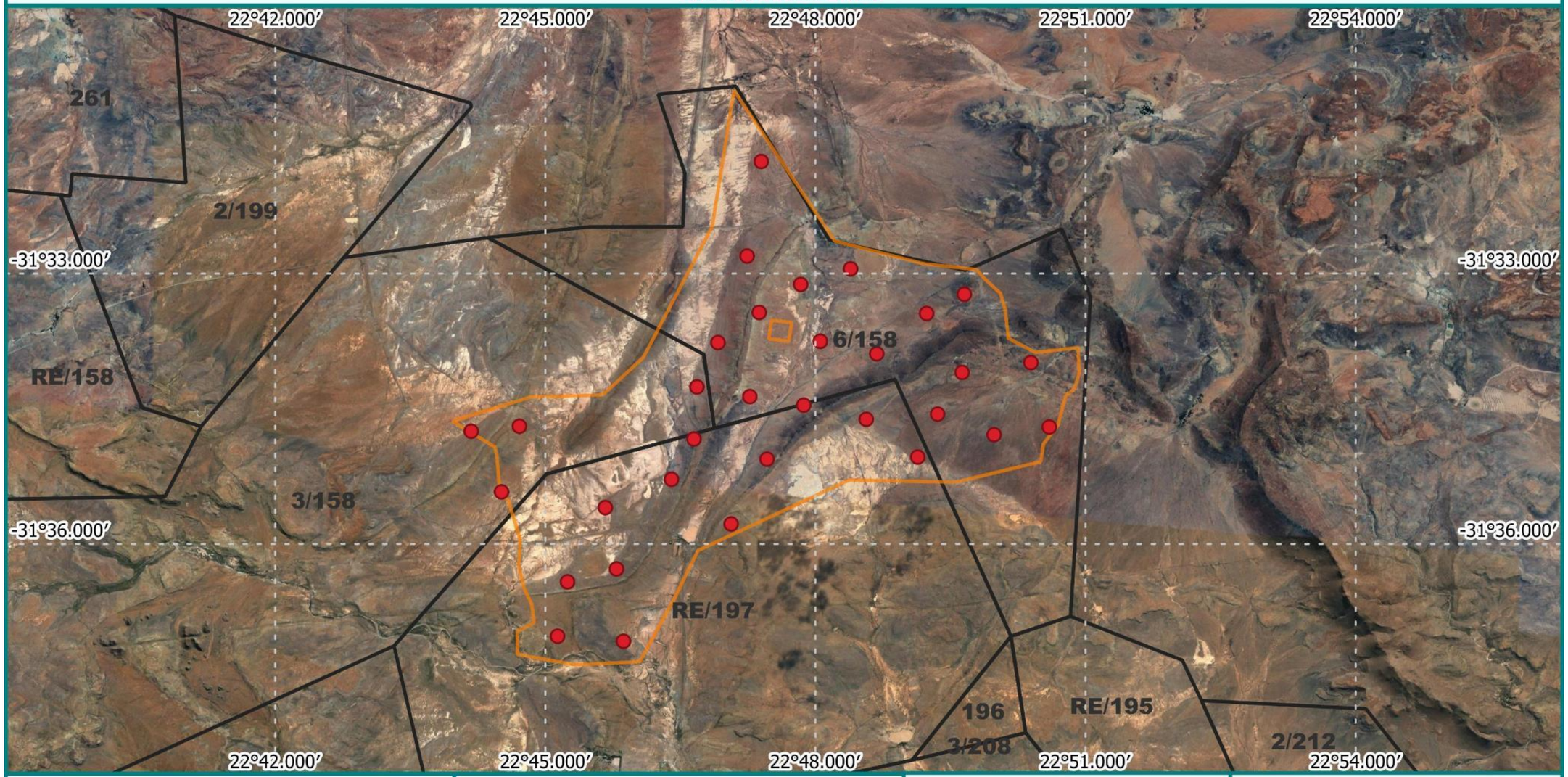
SOUTRIVIER CENTRAL WEF

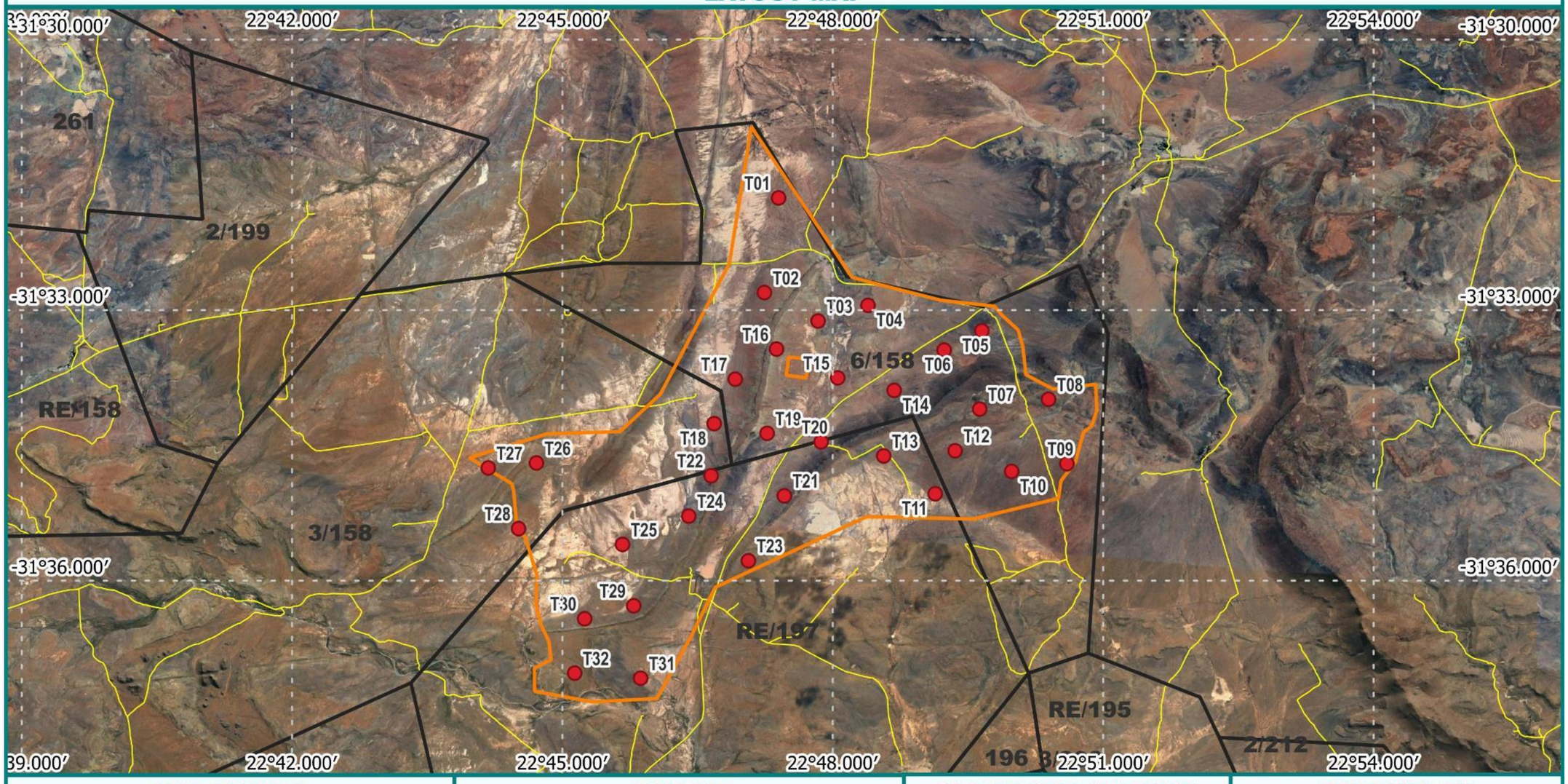
CADASTRAL MAP



MAP DETAILS	LEGEND	SITE IN SOUTH AFRICA	PRODUCED BY
Date: July 2022 Drawn by: Robyn Thomson Datum: WGS 84	Turbines WEF Boundary Farm Portions (Cadastral)		CES ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES
SCALE			**PRODUCED FOR**
0 2.5 5 km			WKN Windcurrent PNE GROUP

SOUTRIVIER CENTRAL WEF

LAYOUT MAP



MAP DETAILS	LEGEND	SITE IN SOUTH AFRICA	PRODUCED BY
Date: July 2022 Drawn by: Robyn Thomson Datum: WGS 84	Turbines Roads WEF Boundary Farm Portions		CES ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES
SCALE			**PRODUCED FOR**
0 2.5 5 km			WKN Windcurrent PNE GROUP

TABLE OF CONTENTS

THE CONTENTS OF A SCOPING REPORT II

ENVIRONMENTAL IMPACT ASSESSMENT TEAM I

GENERAL SITE INFORMATION II

TABLE OF CONTENTS I

LIST OF FIGURES IV

LIST OF TABLES V

1 INTRODUCTION 1

1.1 BACKGROUND INFORMATION 1
1.2 SCOPING PHASE 1
1.3 NATURE AND STRUCTURE OF THIS REPORT 1
1.3.1 Structure *1*
1.3.2 Assumptions and Limitations *3*
1.4 DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER 3
1.4.1 Dr Alan Carter (The EAP & Project Leader) *3*
1.4.2 Ms Caroline Evans (Project Manager & Lead Author) *3*
1.4.3 Mr Bruce d'Hotman (Co-Author) *3*

2 PROJECT DESCRIPTION 5

2.1 PROPOSED ACTIVITY 5
2.2 PROJECT LOCALITY 7
2.3 ENVIRONMENTAL AUTHORISATIONS IN SOUTH AFRICA 9
2.4 TECHNICAL: PROPOSED ACTIVITY 12
2.4.1 Wind Energy Facility (WEF) *12*
2.4.2 Stages of Wind Farm Development *13*

3 PROJECT NEED AND DESIRABILITY 16

3.1 BACKGROUND 16
3.2 CURRENT CONTEXT 16
3.3 ELECTRICITY SUPPLY IN SOUTH AFRICA 17
3.4 SOCIAL AND ECONOMIC DEVELOPMENT 18
3.5 INTERNATIONAL 18
3.5.1 The 1992 United Nations Framework Convention on Climate Change (UNFCCC) *18*
3.5.2 The Kyoto Protocol (2002) *18*
3.6 NATIONAL 19
3.6.1 National Development Plan (2011) *19*
3.6.2 National Climate Change Response White Paper (2012) *19*
3.6.3 White Paper on Renewable Energy Policy (2003) *20*
3.6.4 Integrated Energy Plan for the Republic of South Africa (2003) *20*
3.6.5 Integrated Resource Plan for Electricity 2010-2030 (Revision 2, 2011) *21*
3.6.6 Integrated Resource Plan for Electricity 2010-2030 (Revision 3, 2019) *21*
3.6.7 Draft Integrated Resource Plan (2018) *22*
3.6.8 Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) *22*
3.6.9 Long Term Mitigation Scenarios (2007) *23*
3.6.10 Industrial Policy Action Plan 2011/12 – 2013/14 ..... *24*
3.6.11 Strategic Infrastructure Projects (2012) *24*
3.7 PROVINCIAL 25
3.7.1 Northern Cape Provincial Growth and Development Strategy *25*
3.7.2 Pixley Ka Seme District Municipality Integrated Development Plan *25*
3.7.3 Ubuntu Local Municipality Integrated Development Plan *26*
3.8 SITE SELECTION: WIND CAPABILITY 26

DRAFT

3.9 Renewable Energy Development Zones 26
3.10 Biodiversity Conservation Programmes 29
3.10.1 National Vegetation Map (SANBI) *29*
3.10.2 Critical Biodiversity Areas *29*
3.10.3 Protected Areas *30*
3.11 Concluding Remarks 32

4 RELEVANT LEGISLATION 34

4.1 The Constitution Act (Act No. 108 of 1996) 34
4.2 National Environmental Management Act (Act No. 107 of 1998 and subsequent Amendments) 34
4.3 National Environmental Management: Protected Areas Act (Act No. 57 of 2003) 35
4.4 National Environment Management: Biodiversity Act (No. 10 of 2004) 36
4.5 National Environmental Management: Air Quality Act (No. 39 of 2004) 36
4.6 National Environmental Management: Waste Management Act (No. 59 of 2008) 37
4.7 National Forests Act (No. 84 of 1998) 37
4.8 National Heritage Resources Act (No. 25 of 1999) 38
4.9 Electricity Regulation Act (No. 4 of 2006) 38
4.10 Occupational Health and Safety Act (No. 85 of 1993) 38
4.11 Aviation Act (No. 74 of 1962): 13th Amendment of the Civil Aviation Regulations 1997 38
4.12 National Water Act (No. 36 of 1998) 39
4.13 Conservation of Agricultural Resources Act (No. 43 of 1983) 40
4.14 Subdivision of Agricultural Land Act (No. 70 of 1970) 40
4.15 Mineral and Petroleum Resources Development Act (No. 28 of 2002) 41
4.16 National Road Traffic Act (No. 93 of 1996) 42
4.17 National Veld and Forest Fire Act (No. 101 of 1998) 42
4.18 Other Relevant National Legislation 42

5 DESCRIPTION OF THE ENVIRONMENT: BIOPHYSICAL 44

5.1 Geology and Landform 44
5.2 Topography 44
5.3 Geology 44
5.4 Climate 45
5.5 Heritage Features 46
5.5.1 Archaeology *46*
5.5.2 Historical/Colonial Period *47*
5.5.3 Graves/Cemeteries *47*
5.6 Palaeontological Context of the Area 47
5.7 Landcover 48
5.8 Vegetation & Floristics 49
5.8.1 SANBI Vegetation Map *49*
5.9 Northern Cape Critical Biodiversity Areas 51
5.10 Northern Cape Protected Area Expansion Strategy 52
5.11 Fauna 52
5.11.1 Reptiles *52*
5.11.2 Amphibians *53*
5.11.3 Mammals *53*
5.11.4 Avifauna *53*
5.11.5 Consolidated Species of Conservation Concern *54*
5.12 Rivers, Watercourses and Drainage Lines 55
5.12.1 NFEPA Wetlands and Rivers *55*

6 DESCRIPTION OF THE ENVIRONMENT: SOCIO-ECONOMIC 58

6.1 Description of the Socio-economic process for Renewable Energy Projects 58
6.1.1 Identification of the Beneficiary Community *59*
6.1.2 Financial and Socio-Economic Contributions *59*
6.2 Stakeholders for the Social Assessment of the Soutrivier Central WEF 59
6.3 Baseline Information of the Study Area 60

DRAFT

6.3.1 Ubuntu Local Municipality *60*
6.3.2 Description of the Study Area and Land Uses *60*
6.4 Key Demographic Information 60
6.4.1 Population Size *60*
6.4.2 Population Growth *61*
6.4.3 Age and Gender *61*
6.4.4 Race and Language *62*
6.5 Economic Background 62
6.5.1 Unemployment Rate and Employment Status *62*
6.5.2 Incomes *63*
6.5.3 Economic Sectors & Employment *64*
6.5.4 Economic Development *66*
6.6 Social Status 67
6.6.1 Education *67*
6.6.2 Dependency, Inequality and Poverty Levels *69*
6.6.3 Crime *69*
6.7 Housing, Infrastructure and Services 69
6.7.1 Housing *69*
6.7.2 Services *70*
6.7.3 Landfill Sites *71*
6.7.4 Community Safety *71*
6.7.5 Health Services *72*
6.7.6 Educational Facilities *72*
6.7.7 Road Network *72*
6.8 Land Reform Programmes 72

7 ALTERNATIVES 74

7.1 Reasonable and Feasible Alternatives 74
7.2 Fundamental, Incremental and No-go Alternatives 74
7.2.1 Fundamental Alternatives *74*
7.2.2 Incremental Alternatives *74*
7.2.3 No-go Alternative *74*
7.3 Analysis of Alternatives 75

8 MANNER IN WHICH THE ENVIRONMENT COULD BE AFFECTED 80

8.1 Introduction 80
8.1.1 Issues Identification Matrix *80*
8.2 Impacts Mind Map 81
8.3 Possible Environmental Issues and Impacts 84
8.4 Cumulative Impact Statement 116
8.4.1 Cumulative Impact Identification Process *116*
8.4.2 Cumulative Impacts for Consideration *119*
8.5 Gaps in Knowledge 119

9 PLAN OF STUDY: ENVIRONMENTAL IMPACT ASSESSMENT PHASE 120

9.1 Specific Challenges to the EIA Phase 120
9.2 Scope and Intent of the EIA Phase 120
9.2.1 Impacts Assessment Methodology *121*
Issues Identification Matrix *121*
9.3 Specialist Studies 122
9.3.1 Avifaunal Monitoring and Impact Assessment *123*
9.3.2 Bat Impact Assessment *124*
9.3.3 Ecological Impact Assessment *125*
9.3.4 Riverine Rabbit Impact Assessment *126*
9.3.5 Freshwater Impact Assessment *127*
9.3.6 Archaeological (Heritage) Impact Assessment *128*
9.3.7 Paleontological Impact Assessment *129*

DRAFT

9.3.8 Noise Impact Assessment 129
9.3.9 Socio-economic Impact Assessment 130
9.3.10 Visual Impact Assessment 130
9.4 Environmental Impact Report (EIR) 131
9.5 Issues and Response Trail 132
9.6 Environmental Management Programme (EMPr) 132
9.7 Environmental Authorisation (EA) and Appeals Process 132
9.8 The Public Participation Process (PPP) 133
9.8.1 Initial PPP 133
9.8.2 Public Review Of The Draft Scoping Report (DSR) 133
9.8.3 Public Review of the Draft Environmental Impact Report (DEIR) 133
9.8.4 Notification of Environmental Authorisation (EA) 133
9.9 Environmental Impact Report (EIR) 134
9.9.1 Structure of the EIA Report 134

10 PUBLIC PARTICIPATION 136

10.1 Notification of Interested and Affected Parties 136
10.1.1 Newspaper advertisement 136
10.1.2 Onsite notices 136
10.1.3 Interested and Affected Parties (I&APs) identification and notification 136
10.1.4 Surrounding and Affected Landowners 139
10.1.5 Registered I&APS 139
10.1.6 The Public Participation Process followed and to be followed includes: 139
10.2 Comments and Response Report 140

11 CONCLUSIONS 141

11.1 Conclusion 141
11.2 Opinion 141
11.3 Fatal Flaws 142
11.4 The EIA Process 142

12 APPENDIX A | EAP DECLARATION 143

13 APPENDIX B | EAP CVS 144

14 APPENDIX C | PPP PROOFS 145

14.1 Proof of Advertisement 145
14.2 Proof of Signage 146

List of Figures

Figure 2-1: Soutrivier Central WEF Layout Map. 6
Figure 2-2: Cadastral Map of the Affected Properties within the Proposed Site. 8
Figure 2-3: Locality Map of the Proposed Central Central WEF Site. 8
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. 13
Figure 3-1: DFFE Renewable Energy Development Zones (REDZ). 27
Figure 3-2: DFFE Strategic Transmission Corridors (the site is situated in the central transmission corridor). 28
Figure 3-3: Proposed WEF locations in relation to the closest REDZ (Beaufort West). 28
Figure 3-4: National Vegetation Map for the proposed Soutrivier Central WEF site area. 29
Figure 3-5: Northern Cape Critical Biodiversity Areas. 30
Figure 3-6: Legislated Protected Areas in or around the proposed WEF site. 31

DRAFT

Figure 3-7: NCPAES Focus Areas (Oosthuysen et al. 2017). 31
Figure 3-8: Active PAES Initiatives (Oosthuysen et al. 2017). 32
Figure 5-1: Geology Map of the Soutrivier Central WEF site. 45
Figure 5-2: Landcover Map of the Soutrivier Central WEF site and surrounding areas. 49
Figure 5-3: SANBI Vegetation Map of the Soutrivier Central WEF site and surrounding areas. 50
Figure 5-4: CBA Map of the proposed Soutrivier Central WEF site and surrounding areas. 52
Figure 5-5: Surface Water Map of the Soutrivier Central WEF site and surrounding areas. 56
Figure 6-1: Age Range of Provincial, DM and LM. 62
Figure 6-2: Youth Unemployment Percentage of RSA, NC, DM and LM 63
Figure 6-3: Income Level of the Northern Cape, Pixley Ka Seme DM and Ubuntu LM. 64
Figure 6-4: Employment Sectors of the Northern Cape and Pixley Ka Seme DM (NC Socio Economic Review and Outlook 2021). 65
Figure 6-5: Economic Sectors of Ubuntu LM. 66
Figure 6-6: Education Levels in the Province, DM and LM 68
Figure 6-7: Education Levels in the Ubuntu Municipality 2001 and 2011. 68
Figure 6-8: Electricity supply with the Province, DM and LM. 71

LIST OF TABLES

Table 2-1: Preliminary Construction Footprint of the Soutrivier Central WEF. 6
Table 2-2: Towns in the vicinity of the Soutrivier Central WEF 7
Table 2-3: Soutrivier Central WEF Properties. 7
Table 2-4: Listed activities triggered by the proposed Soutrivier Central WEF 9
Table 4-1. NEMA Environmental Management Principles 34
Table 5-1 Soutrivier Central WEF General Climate Table (Source: en.climate-data.org). 45
Table 5-2: Species of Conservation Concern, Consolidated Table (as per avifaunal and ecological specialist screening). 54
Table 6-1: Safety and Security Facilities. 71
Table 6-2: Health Care Facilities. 72
Table 7-1: Proposed WEF Alternatives. 76
Table 8-1: Ranking of Evaluation Criteria. 81
Table 8-2: Mind map of the impacts identified within the scoping phase of the proposed Soutrivier Central WEF 82
Table 8-3: Issues and impacts identified in the planning and design phase of the proposed development 85
Table 8-4: Issues and impacts identified in the construction phase of the proposed development 89
Table 8-5: Issues and impacts identified in the operational phase of the proposed development 105
Table 8-6: Issues and impacts identified in the decommissioning phase of the proposed development 112
Table 9-1: Ranking of Evaluation Criteria. 122
Table 9-2. Reports that will be generated in the EIA phase for the proposed Soutrivier Central WEF 134
Table 9-1: Stakeholder and Organisational Database 136

DRAFT

1 INTRODUCTION

1.1 BACKGROUND INFORMATION

The Soutrivier Central Wind Energy Facility (WEF) is located between the towns of Victoria West and Loxton in the Northern Cape Province. The project site is situated in the Ubuntu Municipality (LM) which forms part of the Pixley Ka Seme District Municipality. Studies conducted to date show that this area has favourable wind conditions to operate a wind farm.

CES has been appointed by Soutrivier Central Wind Energy Facility RF (Pty) Ltd. as the Environmental Assessment Practitioner (EAP) to conduct the necessary EIA Process required in terms of the National Environmental Management Act (NEMA, Act No. 107 of 1998 and subsequent amendments) EIA Regulations (2014 and subsequent 2017 amendments).

1.2 SCOPING PHASE

The proposed project is currently in the Scoping Phase. The aim of this phase is to determine, in detail, the scope of the EIA required for the proposed activities. The primary objectives of the Scoping Phase, in accordance with the regulatory requirements, are to:

- Describe the nature of the proposed project;
- Enable preliminary identification and assessment of potential environmental issues or impacts to be addressed in the subsequent EIA Phase;
- Define the legal, policy and planning context for the proposed project;
- Describe important biophysical and socio-economic characteristics of the affected environment;
- Undertake a Public Participation Process (PPP) which provides all Stakeholders and Interested and Affected Parties (I&APs) with opportunities to be involved;
- Identify feasible development alternatives which must be assessed in the EIA Phase;
- Identify the potential impacts of the proposed WEF; and
- Define the Plan of Study (PoS) for the EIA Phase.

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 and subsequent 2017 amendments), which clearly specifies the required content of a Scoping Report.

This report is the first of several reports which will be produced during the EIA Process. This Scoping Report has been produced in accordance with the requirements, as stipulated in Appendix 2 of the EIA Regulations, which clearly outlines the content of a Scoping Report, and Chapter 6, Sections 39-44 which cover the activities necessary for a successful PPP.

1.3.1 STRUCTURE

The structure of this Scoping Report is as follows:

1. **Chapter 1: Introduction** – Provides background information on the proposed project, a brief description of the EIA process required in terms of the NEMA EIA Regulations and describes the key steps in the EIA

DRAFT

process which have been undertaken thus far, and those that will be undertaken in the future. The details and expertise of the EAP who prepared this report are also provided in this Chapter.

2. **Chapter 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 within the properties. The technical details of the process to be undertaken are also provided in this Chapter.

3. **Chapter 3: Need and Desirability** – Provides the context of the renewable energy industry in South Africa and outlines how the Soutrivier Central WEF is likely to contribute towards reaching sustainability goals regionally, nationally and internationally.

4. **Chapter 4: Relevant Legislation** – Identifies all the legislation and guidelines that have been considered in the preparation of this Scoping Report.

5. **Chapter 5 & Chapter 6: Description of the affected environment** – Provides a brief overview of the bio-physical and socio-economic characteristics of the site and its environs which could be affected by the proposed development. This information is compiled largely from published information and available spatial data, but it has been supplemented by information which was gathered during site investigations.

6. **Chapter 7: Alternatives** - Provides a brief discussion of the feasible and reasonable alternatives to the proposed project which have been identified and considered, some of which will be investigated further in the EIA Phase.

7. **Chapter 8: Manner in which the environment could be affected** – Provides a description of the key issues which have been identified by the project team as well as through discussions with I&APs thus far in the Scoping Phase, which will be assessed during the EIA Phase.

8. **Chapter 9: Plan of Study (PoS)** – Sets out the proposed approach to the environmental impact assessment of the proposed project including:
   - A description of the scope of work that will be undertaken as part of the EIA Phase, including any specialist reports or specialised processes, and the manner in which the described scope of work will be undertaken;
   - An indication of the stages at which the competent authority will be consulted;
   - A description of the proposed methodology for assessing the environmental issues and alternatives, including the option of not proceeding (no-go alternative) with the proposed development;
   - Particulars of the PPP which will be conducted during the EIA Phase; and
   - Any specific information required by the authority.

9. **Chapter 10: Public Participation Process** - Provides details of the Public Participation Process (PPP) which has been conducted, including:
   - The measures undertaken thus far to notify I&APs of the application;
   - Proof that notice boards, advertisements and notices, notifying potential I&APs of the application have been displayed, placed or distributed;
   - A list of all persons and organisations which have been identified and registered in terms of Regulation 57 as I&APs in relation to the application.

10. **Chapter 11: Conclusions** – This chapter consists of the concluding remarks of the Scoping Phase and any specific recommendations for the EIA Phase.

11. **Chapter 12: EAP Affirmation**

12. **Chapter 13: EAP CVs**

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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 which has been taken from design specifications for the proposed wind farm that have not yet been finalised, and which are likely to undergo a number of refinements before it can be regarded as definitive. A project description based on the final design will be provided during the EIA Phase.
- Descriptions of the natural and social environments are based on limited fieldwork and available literature. More information will be provided during the EIA Phase, once the specialist studies have been undertaken.
- The preliminary turbine site layout and associated infrastructure will be presented in the EIA Phase and subject to the necessary specialist assessments. It is anticipated that this preliminary layout will be further refined as per the outcomes of these studies and overall EIA findings.

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 Scoping Report are provided below.

1.4.1 Dr Alan Carter (The EAP & Project Leader)

Dr Alan Carter 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 international accounting firms in South Africa and the USA. 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 25 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 & Lead Author)

Caroline is a Senior Environmental Consultant with more than 5.5 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 Mr Bruce d'Hotman (Co-Author)

Bruce is a Senior Environmental Consultant with 10 years' experience and is based in the Johannesburg branch. He holds a BSc Hons with Majors in Zoology and Ichthyology. He is a Professionally Registered Natural Scientist and has experience working on large scale mining and commercial projects throughout Southern and West Africa. He has worked on all phases of these projects from initial feasibility through to completion and monitoring. This includes managing Basic Assessments, Environmental Impact Assessments, Environmental Compliance Monitoring, Environmental Management Plans and Water Use Licencing. Apart

from General Environmental Management Bruce also has experience in game counts, flora surveys, wetland management and rehabilitation. His interests in the environmental field include sensitive area management as well as rehabilitation of degraded areas.

PLEASE FIND THE *CURRICULUM VITAE* ATTACHED AS APPENDIX B, CHAPTER 13

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2 PROJECT DESCRIPTION

2.1 PROPOSED ACTIVITY

WKN-Windcurrent SA (Pty) Ltd. plans to develop, construct and operate a Wind Energy Facility (WEF) approximately 30km southwest of Victoria West in the Northern Cape Province. The project site is situated in the Ubuntu Local Municipality (LM) which forms part of the Pixley ka Seme District Municipality (DM).

The proposed Soutrivier Central Wind Energy Facility (WEF) will consist of up to 32 turbines, with a total facility output of up to 270MW. The WEF will also include a powerline and switching station in order to connect the WEF to the existing Eskom Substation (this will be applied for in a separate environmental application). The WEF will also include a Battery Energy Storage System (BESS), temporary and permanent laydown areas, an IPP Substation (SS), a Concrete Tower Manufacturing Facility (CTMF), access roads and a construction compound (CC) area. The construction footprint of the proposed WEF will be up to 125ha (inclusive of roads), rehabilitated to an operational footprint of up to 77ha (inclusive of roads).

The summary, the proposed Soutrivier Central WEF will include:

- Up to 32 turbines with a maximum nominal power output of up to 270MW;
- The proposed WEF will include turbines with a hub height of up to 200m, a rotor diameter of up to 240 m, blade length of up to 120m, and a total tip height of up to 320m;
- Permanent laydown areas adjacent to each wind turbine (up to 3 000 m2);
- Temporary laydown areas adjacent to each wind turbine (up to 3 000 m2);
- Foundations (up to 900 m^2) for each wind turbine;
- IPP Substation (SS) of up to 3ha (inclusive of a 33/132kV SS, offices and parking and a permanent SS laydown area);
- Temporary laydown area, CTMF and CC of up to 10ha;
- BESS of up to 10ha (temporary laydown area, CTMF and CC area will be converted to the BESS facility post-construction phase);
- Medium voltage cabling between turbines and the switching stations, to be laid underground where technically feasible; and
- Internal access roads of up 32km constructed at up to 14m 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.

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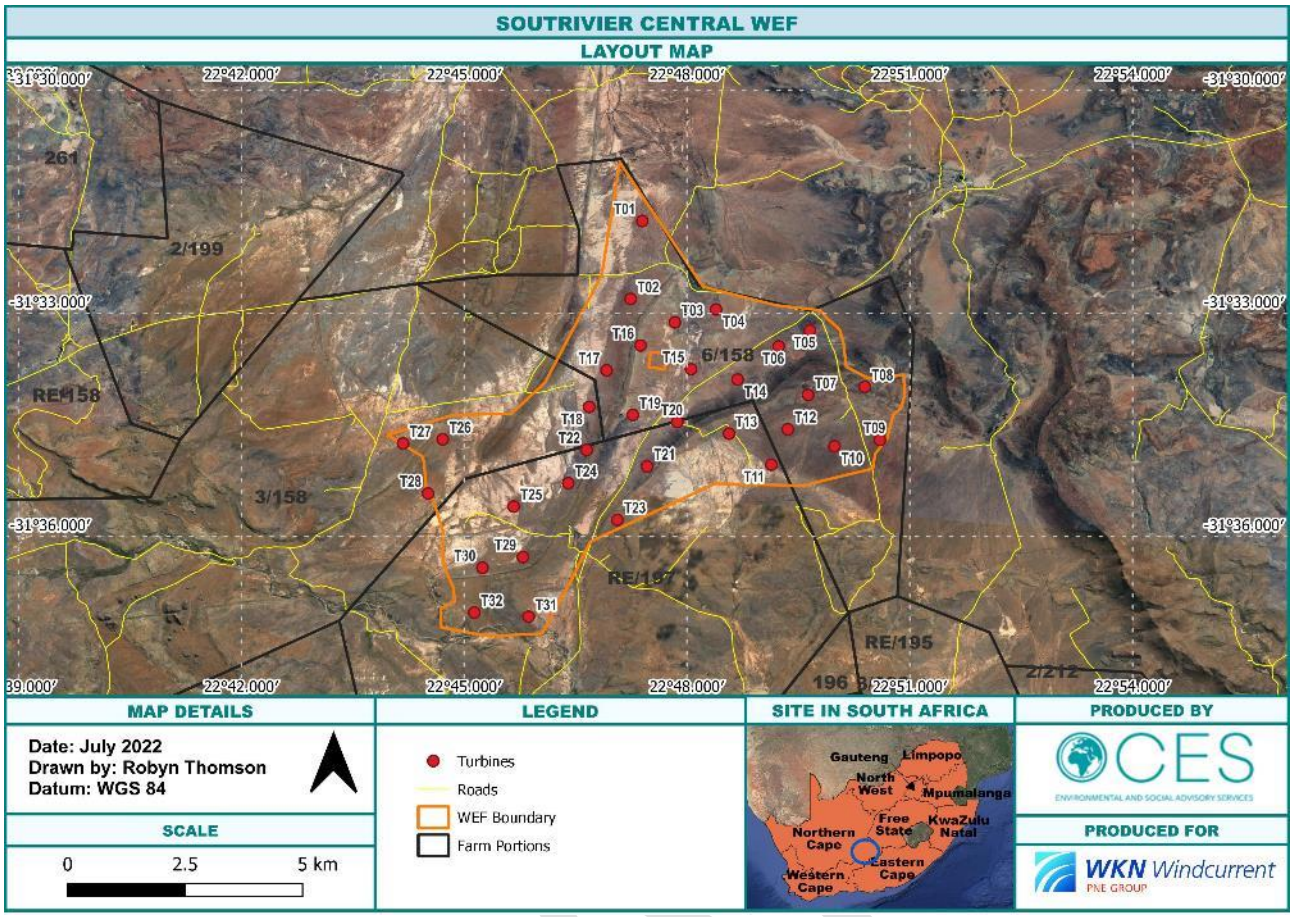

Figure 2-1: Soutrivier Central WEF Layout Map.

The footprint of the facility is calculated as follows:

Table 2-1: Preliminary Construction Footprint of the Soutrivier Central WEF.

FACILITY COMPONENT	CONSTRUCTION FOOTPRINT	FINAL FOOTPRINT AFTER REHABILITATION
Permanent Laydown Area	TOTAL 3000 m^2 x 32 turbines = 96 000 m^2 which equates to **9.6 ha**	TOTAL 3000 m^2 x 32 turbines = 96 000 m^2 which equates to **9.6 ha**
Temporary Laydown Area	TOTAL 3000 m^2 x 32 turbines = 96 000 m^2 which equates to **9.6 ha**	TOTAL 0 m^2 x 32 turbines = 0m^2 which equates to 0 **ha**
Turbine Foundation	TOTAL Up to 900m^2 x 32 turbines = 28 800 m^2 which equates to **2.88 ha**	TOTAL Up to 900m^2 x 32 turbines = 28 800 m^2 which equates to **2.88 ha**
WEF Substation	33/132kV Substation – 1.5ha Offices and parking – 0.5ha Permanent Laydown – 1ha	33/132kV Substation – 1.5ha Offices and parking – 0.5ha Permanent Laydown – 1ha
BESS	TOTAL 10ha / 2700MWh	TOTAL 10ha / 2700MWh
Temporary Laydown Area, Concrete Tower Manufacturing Facility and Construction Compound	10 ha clearance includes Temporary laydown Construction compound Concrete batching plant Crusher plant All to become area cleared for BESS (above) afterwards.	10 ha clearance includes Temporary laydown Construction compound Concrete batching plant Crusher plant All to become area cleared for BESS (above) afterwards.
New Internal Access Roads (14 m construction, rehabilitated to 8 m during operation)	TOTAL 32 000 m x 14m = 448 000 m^2 which equates to 44.8 **ha**	TOTAL 32 000 m x 8m = 256 000 m^2 which equates to 25.6 **ha**
Upgraded Existing Internal Access Roads	TOTAL 32 000 m x 14m = 448 000 m^2	TOTAL 32 000 m x 8m = 256 000 m^2

FACILITY COMPONENT	CONSTRUCTION FOOTPRINT	FINAL FOOTPRINT AFTER REHABILITATION
	which equates to 44.8 **ha**	which equates to 25.6 **ha**
TOTAL FOOTPRINT:	**124.68 ha** ***of clearing needed for the construction phase of the development of the proposed Soutrivier Central WEF***	**76.68 ha** ***of clearing remaining during the post-construction operational phase (after rehabilitation) of the proposed Soutrivier Central WEF***

2.2 PROJECT LOCALITY

The project area is potentially up to 20 222 hectares (ha) in extent (Table 2-1), with a total development footprint of 125 ha (pre-rehabilitation) and 77 ha (post-rehabilitation) depending on the final layout design. It is located in the Ubuntu LM and it is situated approximately 35km to the west of Victoria West. The R63 road connects the towns of Loxton and Victoria West directly to the North of the study area. The direction and distance from the project area to some of the nearest towns are indicated in Table 2-2 below:

Table 2-2: Towns in the vicinity of the Soutrivier Central WEF.

TOWN NAME	APPROXIMATE DISTANCE	DIRECTION
Victoria West	35 km	East
Loxton	25 km	Northwest
Three Sisters	70 km	Southeast
Beaufort West	90 km	South

Table 2-3 indicates the property portions and farm names associated with the Soutrivier Central WEF project area. The proposed project is situated on approximately 20 222 ha, consisting of three (3) farm portions.

Table 2-3: Soutrivier Central WEF Properties.

WEF: Soutrivier Central		
SG DIGIT NUMBER	**FARM NUMBER/PORTION**	**AREA (HA)**
C08000000000019700000	RE/197 (also SR South)	6869
C08000000000015800003	3/158 (also SR North)	9165
C08000000000015800006	6/158 (also SR North)	4188
	TOTAL	**20 222**

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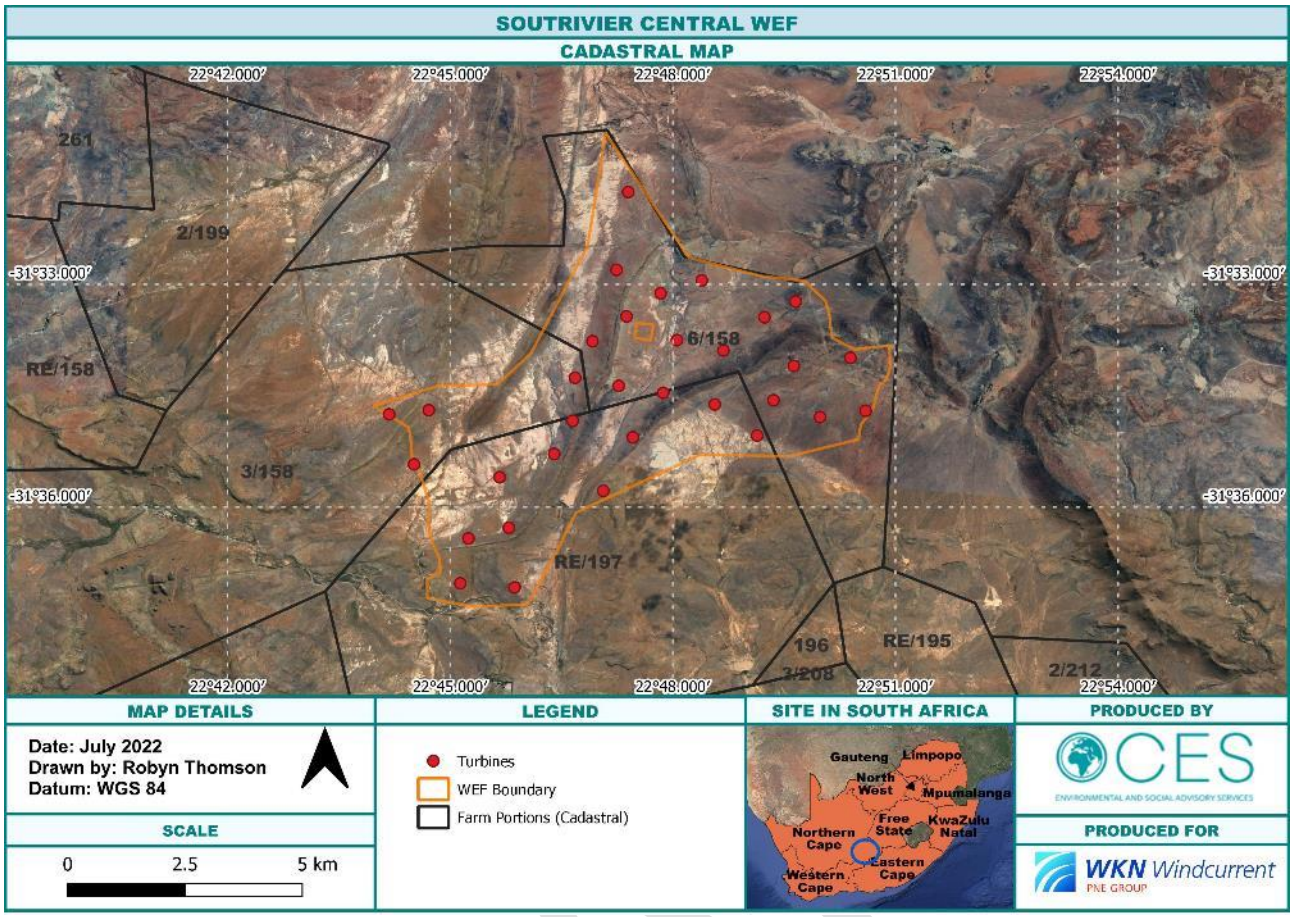

Figure 2-2: Cadastral Map of the Affected Properties within the Proposed Site.

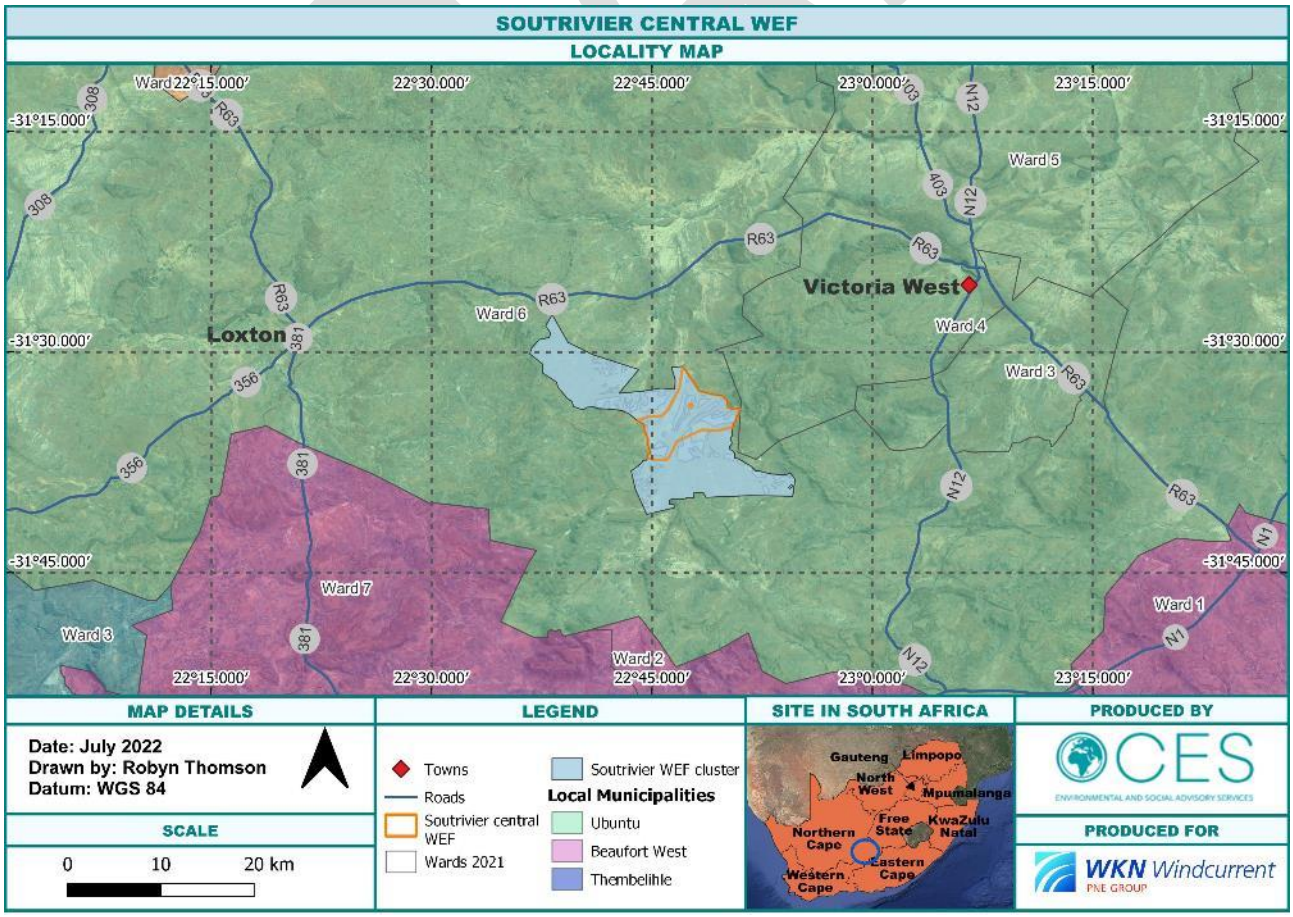

Figure 2-3: Locality Map of the Proposed Central Central WEF Site.

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.

The NEMA EIA Regulations (2014 and subsequent 2017 amendments) allow for a Basic Assessment (BA) Process for activities with limited environmental impact (listed in GN R. 983/GN R. 327 & GN R. 985/GN R. 324) and a more rigorous two- tiered approach to activities with potentially greater environmental impact (listed in GN R. 984/GN R. 325). This two-tiered approach includes both a Scoping and EIA Process. The proposed Soutrivier Central WEF project activities trigger the need for a Scoping and EIA Process in accordance with the NEMA EIA Regulations (2014 and subsequent 2017 amendments) Listing Notices 1, 2 and 3 and published in Government Notices No. R. 983 (GN R. 327), R. 984 (GN R. 325) and R. 985 (GN R. 324) respectively. The listed activities which are being applied for are provided in Table 2-4 below.

Table 2-4: Listed activities triggered by the proposed Soutrivier Central WEF

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 1** of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
11	**The development of facilities or infrastructure for the transmission and distribution of electricity– Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.**	33kV underground (where possible) electrical cables will be laid to transmit electricity generated by the wind turbines to the onsite switching station (IPP SS).
12	The development of— **(i) infrastructure or structures with a physical footprint of 100 square metres or more;** where such development occurs— **(a) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —** **(b) In front of a development setback; or** **(c) If no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.**	This relates to the proposed turbine footprints, cabling routes, internal roads, substation, laydown areas, construction compound area, BESS and other ancillary infrastructure and operation and maintenance buildings which may be constructed within 32m of watercourse. The final siting of this infrastructure will be refined throughout the process.
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 road and cable crossings that may be required during internal road construction and cable installation. The siting of the roads and cable routes will be refined throughout the EIA process of the proposed 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 farm 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. Roads will be 14m wide during the construction phase and will be rehabilitated to have a final operational footprint of 8m.

28	**Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development: Will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.**	The proposed development will entail the rezoning of land from agriculture to special industrial for the placement of the wind energy facility components. The total footprint of the proposed WEF will be up to 77ha in extent (operational phase).
56	**The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre**	The road network will need to be developed and upgraded (using all technically feasible existing farm 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. Roads will be 14m wide during the construction phase and will be rehabilitated to have a final operational footprint of 8m.
Activity No(s):	**Provide the relevant Scoping and EIR 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 WEF will include the construction of up to 32 turbines with a maximum output capacity of up to 270MW.
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 BESS potential dangerous goods will need to be defined based on the preferred alternative. 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.
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 WEF will be approximately 125ha in extent (construction phase) and 77ha in extent (operational phase).

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 3** of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
4 (g)ii.(ee)	**The development of a road wider than 4 metres with a reserve less than 13,5 metres.** **g. Northern Cape** **ii. Outside urban areas:** **(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;**	The proposed roads will be wider than 4m (14m construction phase, rehabilitated to 8m operational phase). The WEF contains CBA 1 and CBA 2 areas as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016).
12(g)ii.	**The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.** **g. Northern Cape** **ii. Within critical biodiversity areas identified in bioregional plans;**	The WEF will result in the loss of Indigenous vegetation in excess of 300 square metres. The WEF contains CBA 1 and CBA 2 areas as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016).
14(ii)(a and b)(g)ii.(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;** **(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;** **g. Northern Cape** **ii. Outside urban areas:** **(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;**	This relates to the proposed cabling routes and internal roads which may be constructed within a watercourse. The combined physical footprint at the various watercourse crossings may exceed 10 square metres. The WEF contains CBA 1 and CBA 2 areas as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016).
18(g)ii.(ee)(ii)	**The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.** **g. Northern Cape** **ii. Outside urban areas:** **(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;** **(ii) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland**	The proposed roads will be widened by more than 4m and lengthened by more than 1 kilometre in some areas (14m construction phase, rehabilitated to 8m operational phase). The WEF contains CBA 1 and CBA 2 areas as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016).

The Applicant, or the EAP on behalf of the Applicant, is initially required to submit a report detailing the Scoping Phase (Scoping Report – this report) and set out the ToR for the EIA Process (Plan of Study for EIA). This is then followed by a report detailing the EIA Phase, the Environmental Impact Report (EIR). The Competent Authority will issue a final decision after their review of the Final EIR.

The Competent Authority that must consider and decide on the application for authorisation in respect of the activities, listed in Table 2-4 above, is the Department of Forestry, Fisheries and the Environment (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 the requirements for an Environmental Authorisation (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);
- 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

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 Soutrivier Central WEF will consist of up to 32 wind turbines, for a total combined maximum output capacity of up to 270 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:

- 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 Soutrivier Central WEF turbines is up to 240 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 life time of the turbine. The maximum hub height of the Soutrivier Central WEF turbines is up to 200 m.

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

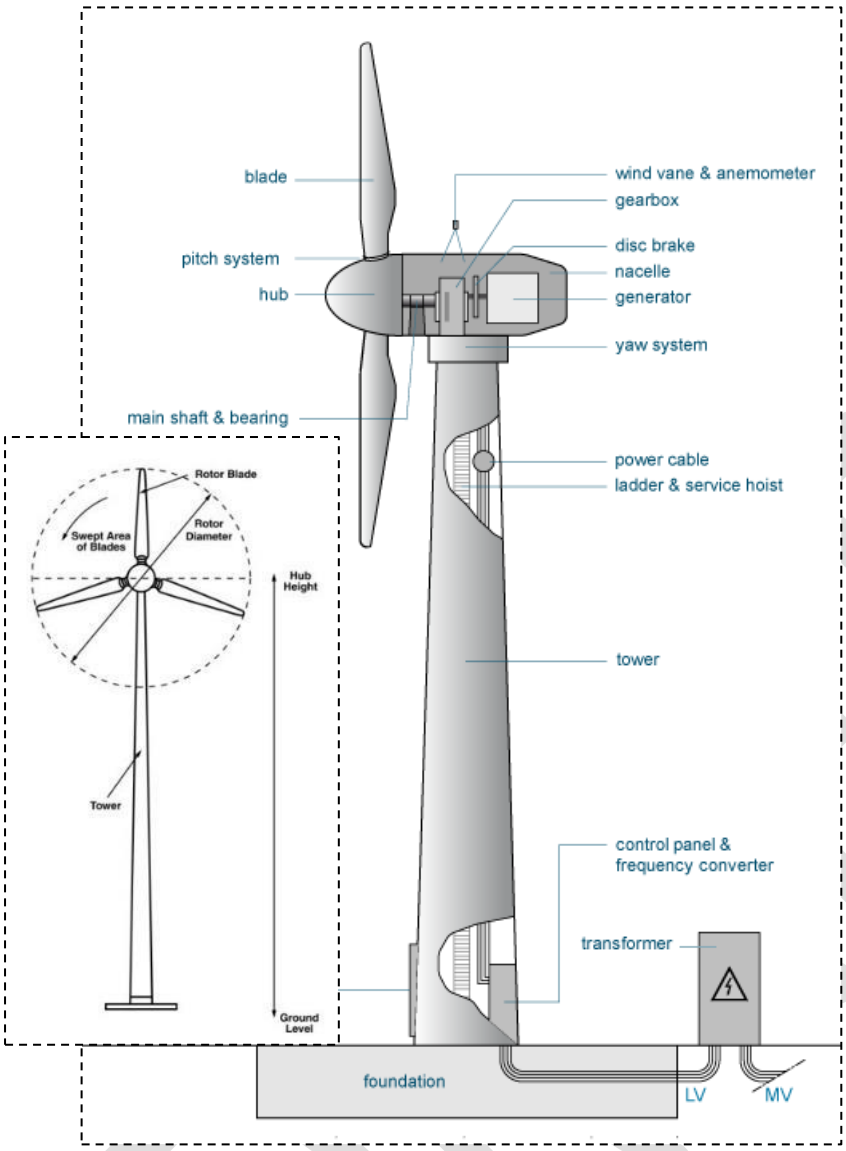

Figure 2-4. Illustrations of the main components of a typical wind turbine. *Note that the transformer would typically be inside the tower (probably at the base). Sources: www.newen.ca and www.soleai.com.

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
- Decommission.

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 14 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 (refer to Figure 2-4); 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.

Other works to be undertaken during the construction phase include:

(a) 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.

(b) 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.

(c) 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.

(d) 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.

(e) 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.

(f) 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.

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(g) 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.

(h) 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.

(a) Facility re-powering

The Wind turbines are expected to have a lifespan of approximately 20 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.

D) 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.

(a) 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.

(b) Disassemble all individual components

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

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3 PROJECT NEED AND DESIRABILITY

3.1 BACKGROUND

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 Environmental Authorisation (EA), the competent authority must comply with section 24O of the National Environmental Management Act, No 107 of 1998 (NEMA), 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 Environmental Impact Assessment (EIA) regulations require environmental assessment practitioners (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 Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) and Environmental Management Frameworks (EMF). 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.

3.2 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 contributing to global 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 Energy (DoE) 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.

3.3 ELECTRICITY SUPPLY IN SOUTH AFRICA

South Africa's current electricity generation and supply system is unreliable. Currently, 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 5% 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, with the utility company, Eskom, as the single buyer of the electricity.

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.

In terms of the REIPPPP, bidders will be required to bid on tariff and the identified socio-economic development objectives of the DoE. The tariff will be 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. Please see section 6.3.8 for more information regarding the REIPPPP.

According to the REIPPP website (1 May 2022) the DMRE will soon launch the Request for Proposals (RFP) for the Sixth (6th) Bid Window under the REIPPPP.

This procurement bid window is the second to be released in line with the Ministerial Determination, promulgated on 25th September 2020, which seeks to procure 11 813 MW of power from various sources including renewable energy, storage, gas and coal.

The RFP calls for proposals from Independent Power Producers (IPPs) to develop new generation capacity of 2 600 MW, including 1 600 MW from onshore wind energy and 1 000 MW from Solar Photovoltaic (Solar PV) power plants.

This 6th Bid Window has been 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.

3.4 Social and Economic Development

Soutrivier Central WEF 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 Soutrivier Central 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; 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 (Northern Cape Province) policy documents.

3.5 International

3.5.1 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 SOUTRIVIER CENTRAL WEF

The UNFCCC is relevant in that the proposed Soutrivier Central 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.

3.5.2 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 SOUTRIVIER CENTRAL WEF

The Kyoto Protocol is relevant in that the proposed Soutrivier Central 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.

3.6 NATIONAL

3.6.1 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.
- 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 SOUTRIVIER CENTRAL WEF

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

3.6.2 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.
- 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.
- 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 SOUTRIVIER CENTRAL WEF

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

3.6.3 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 SOUTRIVIER CENTRAL WEF

The proposed Soutrivier Central 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.

3.6.4 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.
- The need to undertake integrated energy planning on an on-going basis.

RELEVANCE TO THE PROPOSED SOUTRIVIER CENTRAL WEF

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

3.6.5 Integrated Resource Plan for Electricity 2010-2030 (Revision 2, 2011)

The Integrated Resource Plan (IRP, 2010) for South Africa was initiated by the DoE 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.
- Security of supply.

The Policy-Adjusted IRP includes recent developments with respect to prices and allocates 17 800 MW for renewables, of the total 42 600 GW (including both renewables and non-renewables) new-build up to 2030 allocated as follows:

- Wind at 8 400 MW.
- Concentrated solar power at 1 000 MW.
- Photovoltaic at 8 400 MW.

RELEVANCE TO THE PROPOSED SOUTRIVIER CENTRAL WEF

The Soutrivier Central WEF is in line with the IRP for electricity and will contribute towards finding an appropriate balance between the various stakeholders as per the IRP2011.

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

The Integrated Resource Plan (IRP, 2019) for South Africa was initiated by the DoE 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 IRP 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. The following image outlines the steps taken between the last IRP Revision (2011) and the latest IRP Revision (2019). As per the CSIR summary (Online: https://researchspace.csir.co.za/)

RELEVANCE TO THE PROPOSED SOUTRIVIER CENTRAL WEF

The proposed Soutrivier Central 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.

3.6.7 Draft Integrated Resource Plan (2018)

The 2011 version of the IRP is currently under review with a draft version having been put out for comment in August 2018.

The draft IRP 2018 is essentially a plan for South Africa's future energy needs but also attempts to balance a number of objectives, including: security of supply, at minimal cost, with minimal environmental impacts (including CO_2 emission reduction targets) and minimal water usage.

Drawing from the conclusions of the scenarios analysed, the scenario of RE without annual build limits provides the least-cost path up to 2050. The significant change in the energy mix post 2030 and the sensitivity of the energy mix to the assumptions are key points to note.

It is therefore recommended that the post 2030 path not be confirmed, but that detailed studies be undertaken to inform the future update of the IRP. These studies should, among others, include the following:

- Detailed analysis of the appropriate level of penetration of RE in the South African national grid to better understand the technical risks and mitigations required to ensure security of supply is maintained during the transition to a low-carbon future.

For the period ending 2030, a number of policy adjustments are proposed to ensure a practical plan that will be flexible to accommodate new, innovative technologies that are not currently cost competitive, the minimization of the impact of decommissioning of coal power plants and the changing demand profile.

Applied policy adjustment and considerations in the final proposed plan includes the following:

- A least-cost plan with the retention of annual build limits (1 000 MW for PV and 1 600 MW for wind) for the period up to 2030. This provides for smooth roll out of RE, which will help sustain the industry.

RELEVANCE TO THE PROPOSED SOUTRIVIER CENTRAL WEF

The proposed Soutrivier Central WEF is in line with the draft IRP 2018 with respect to the energy mix and movement to a low carbon economy up to 2030 and beyond.

3.6.8 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 will be required to bid on tariff and the identified socio-economic development objectives of the DoE. The tariff will be 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 following table summarises the REIPPPP bidding windows which have already been completed.

Bidding Window 1	Bidding Window 2	Bidding Window 3	Bidding Window 3.5	Bidding Window 4	Bidding Window 5
• Submission Date: 04/11/2011 • 28 Preferred Bidders • 1 425 MW of contracted capacity	• Submission Date: 05/03/2012 • 19 Preferred Bidders • 1 040 MW of contracted capacity	• Submission Date: 19/08/2013 • 17 Preferred Bidders • 1 457 MW of contracted capacity	• Submission Date: 31/04/2014 • 2 Preferred Bidders • 200 MW of contracted capacity	• Submission Date: 18/08/2014 • 26 Preferred Bidders • 2 205 MW of contracted capacity	• Submission Date: 28/10/2021 • 25 Preferred Bidders • 2 205 MW of contracted capacity

According to the REIPPP website (1 May 2022) the DMRE will soon launch the Request for Proposals (RFP) for the Sixth (6th) Bid Window under the REIPPPP.

This procurement bid window is the second to be released in line with the Ministerial Determination, promulgated on 25th September 2020, which seeks to procure 11 813 MW of power from various sources including renewable energy, storage, gas and coal.

The RFP calls for proposals from Independent Power Producers (IPPs) to develop new generation capacity of 2 600 MW, including 1 600 MW from onshore wind energy and 1 000 MW from Solar Photovoltaic (Solar PV) power plants.

This 6th Bid Window has been 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 SOUTRIVIER CENTRAL WEF

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

3.6.9 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 SOUTRIVIER CENTRAL WEF

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

3.6.10 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 SOUTRIVIER CENTRAL WEF

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

3.6.11 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 SOUTRIVIER CENTRAL WEF

The Soutrivier Central WEF will contribute to SIP project role out.

3.7 PROVINCIAL

3.7.1 NORTHERN CAPE PROVINCIAL GROWTH AND DEVELOPMENT STRATEGY

The Northern Provincial Growth and Development Strategy (2019) (NCPGPS) aims to place the Northern Cape Province on a new development trajectory of sustainable development which forms part of its long-term strategic approach. The strategy is based on the 2015 Sustainable Development Goals (SDGs'), which is the blueprint for global development in order to achieve a better and more sustainable future for all. The NCPGDS recognises that social wellbeing is a complex concept, and refers to several aspects relating to human life, such as happiness, material fulfilment and personal needs. Although many aspects of social well-being can only be achieved by an individual and their subjective feelings and experiences, access to basic infrastructure and economic opportunities acts as a catalyst for achieving various levels of human well-being.

In terms of the Economy, the Northern Cape is perfectly placed to be at the forefront of another industrial revolution. The Strategy points out that the Provinces vast resources including sun, wind, open spaces, ocean, the various minerals and semi-precious stones, amongst others provides the province with competitive and comparative advantages. Environmental sustainability can only be achieved if the province's environmental assets and natural resources are protected and enhanced. The Northern Cape Province is endowed with rich natural resources and mineral deposits which offers the opportunity to fund the transition to a low-carbon future and a more diverse and inclusive green economy if used responsibly.

Furthermore, the Northern Cape Province Strategic Plan 2020-2025 references the need to ensure the availability of inexpensive energy as a means to promote economic growth in the Northern Cape. The availability of electricity to key industrial users at critical localities at competitive rates will ensure the competitiveness of these industries. At the same time, the development of new sources of energy through the promotion of the adoption of energy applications that display synergy with the province's natural resource endowments must be encouraged. The report further states that the development of energy sources such as wind energy, the natural gas fields, bio-fuels, etc., could be some of the means by which new economic opportunity and activity is generated in the Northern Cape. This also highlights the importance of close co-operation between public and private sectors in order for the economic development potential of the Northern Cape to be realised.

RELEVANCE TO THE PROPOSED SOUTRIVIER CENTRAL WEF

The proposed Soutrivier Central WEF is in line with the Northern Cape Provincial Development Plan as it entails the development of a wind farm which could potentially contribute up to 270 MW of electricity to the Eskom Grid.

3.7.2 PIXLEY KA SEME DISTRICT MUNICIPALITY INTEGRATED DEVELOPMENT PLAN

The Vision for the District Municipality as presented in the Integrated Development Plan (IDP) is "Sustainably Developed District for future Generations". Along with the following Strategic goals:

- Supporting of local municipalities to create a home for all individuals in the towns, settlements and
- rural areas to render dedicated services;
- Providing political and administrative leadership and direction in the development planning process;
- Promoting economic growth that is shared across and within communities;
- Promoting and enhancing integrated development planning in the operations of all local municipalities; Aligning development initiatives in the district to the National Development Plan.

RELEVANCE TO THE PROPOSED SOUTRIVIER CENTRAL WEF

The proposed Soutrivier Central WEF is in line with the Pixley Ka Seme IDP in that the SWOT analysis undertaken identified solar and wind farms as potential opportunities.

3.7.3 Ubuntu Local Municipality Integrated Development Plan

The Ubuntu Local Municipality Integrated Development Plan 2021/2022 aims to be a blueprint for the future development trajectory of the municipality. One of the many challenges identified is to ensure that all citizens have access to basic services such as water, sanitation, electricity, and housing. In this regard, electricity infrastructure development is a key component of the municipality's strategic objective for the provision of sustainable basic services. The establishment of additional electrical infrastructure, such as the proposed Soutrivier Central WEF is an important stepping-stone in achieving the desired goals. One of the strengths identified within the LM is the availability of land and the resulting opportunity to utilise this land for renewable energy projects.

RELEVANCE TO THE PROPOSED SOUTRIVIER CENTRAL WEF

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

3.8 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 finalise the positions of the wind turbines. The masts were marked as per the requirements of the Civil Aviation Authority (CAA).

3.9 Renewable Energy Development Zones

On the 17th of February 2016, the Cabinet of the Republic of South Africa (Cabinet) approved the gazetting of Renewable Energy Development Zones (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 in creating a "predictable regulatory framework that reduces bureaucracy related to the cost of compliance".

The DEA's media statement issued in respect of the approved gazetting of the REDZs provided that in Phase 1 8 REDZs and 5 Power Corridors were 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). Phase 2 saw the addition of 3 additional REDZ which are located in Emalahleni (Mpumalanga), Klerksdorp (Free State / North West) and Beaufort West (Western Cape).

The 5 Power Corridors are planned 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, 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 proposed Soutrivier Central WEF falls just to the North of the Beaufort West zone. The site does however fall within the Central Corridor.

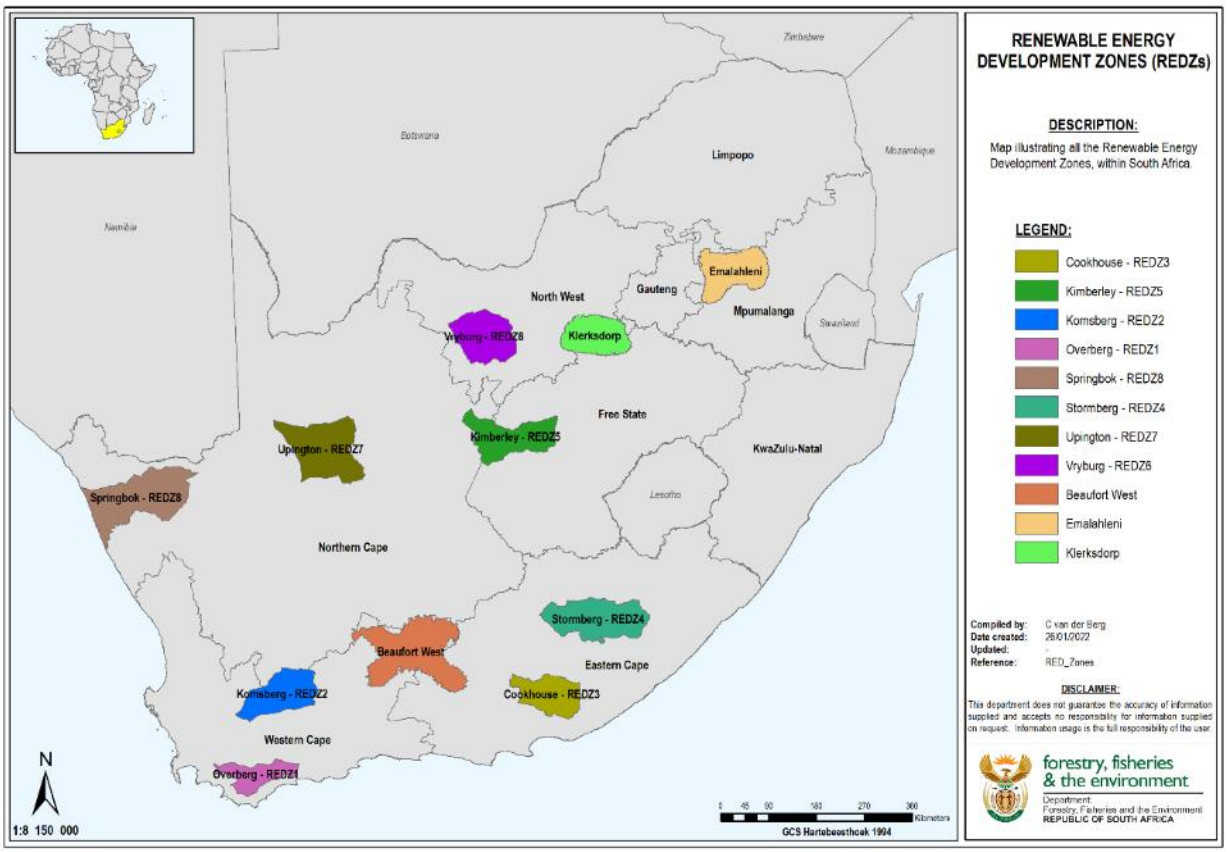

Figure 3-1: DFFE Renewable Energy Development Zones (REDZ).

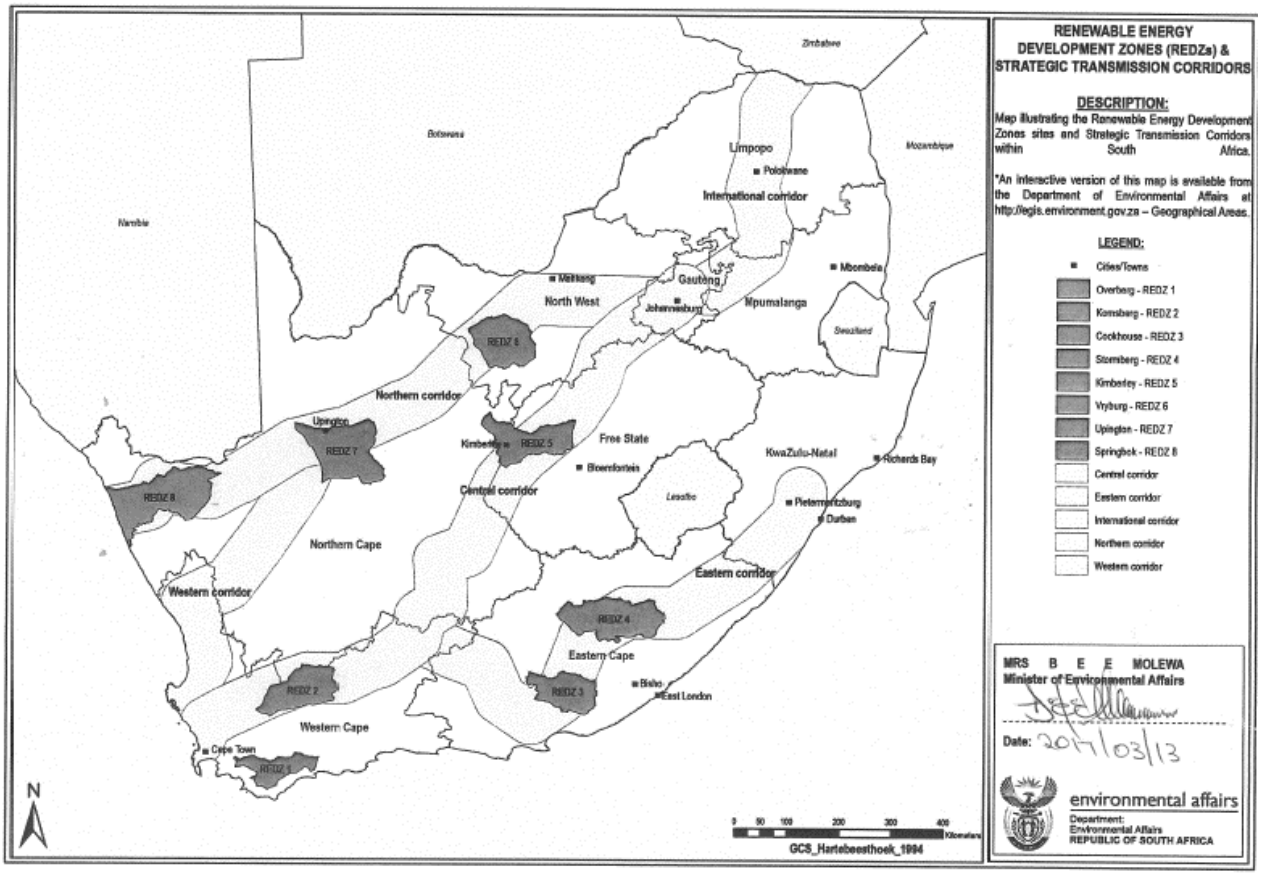

Figure 3-2: DFFE Strategic Transmission Corridors (the site is situated in the central transmission corridor).

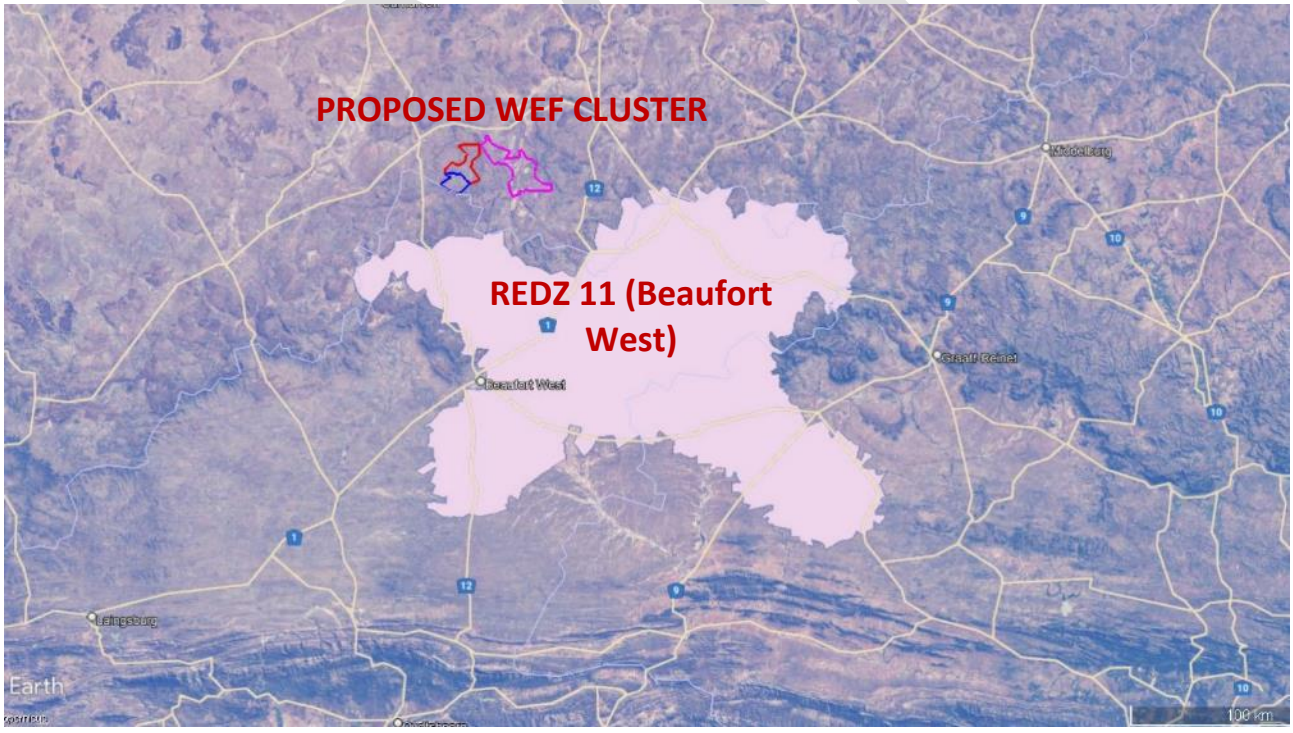

Figure 3-3: Proposed WEF locations in relation to the closest REDZ (Beaufort West).

RELEVANCE TO THE PROPOSED SOUTRIVIER CENTRAL WEF

Although the proposed Soutrivier Central WEF does not occur within a REDZ area, it is situated within the central transmission corridor.

3.10 BIODIVERSITY CONSERVATION PROGRAMMES

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

3.10.1 NATIONAL VEGETATION MAP (SANBI)

As indicated in the baseline ecological assessment at Section 5 of this Scoping Report, according to SANBI's National Vegetation Map (2018), the proposed WEF occurs within one (2) vegetation types, namely Eastern Upper Karoo (least threatened) and Upper Karoo Hardeveld (least threatened) (Figure 3-4).

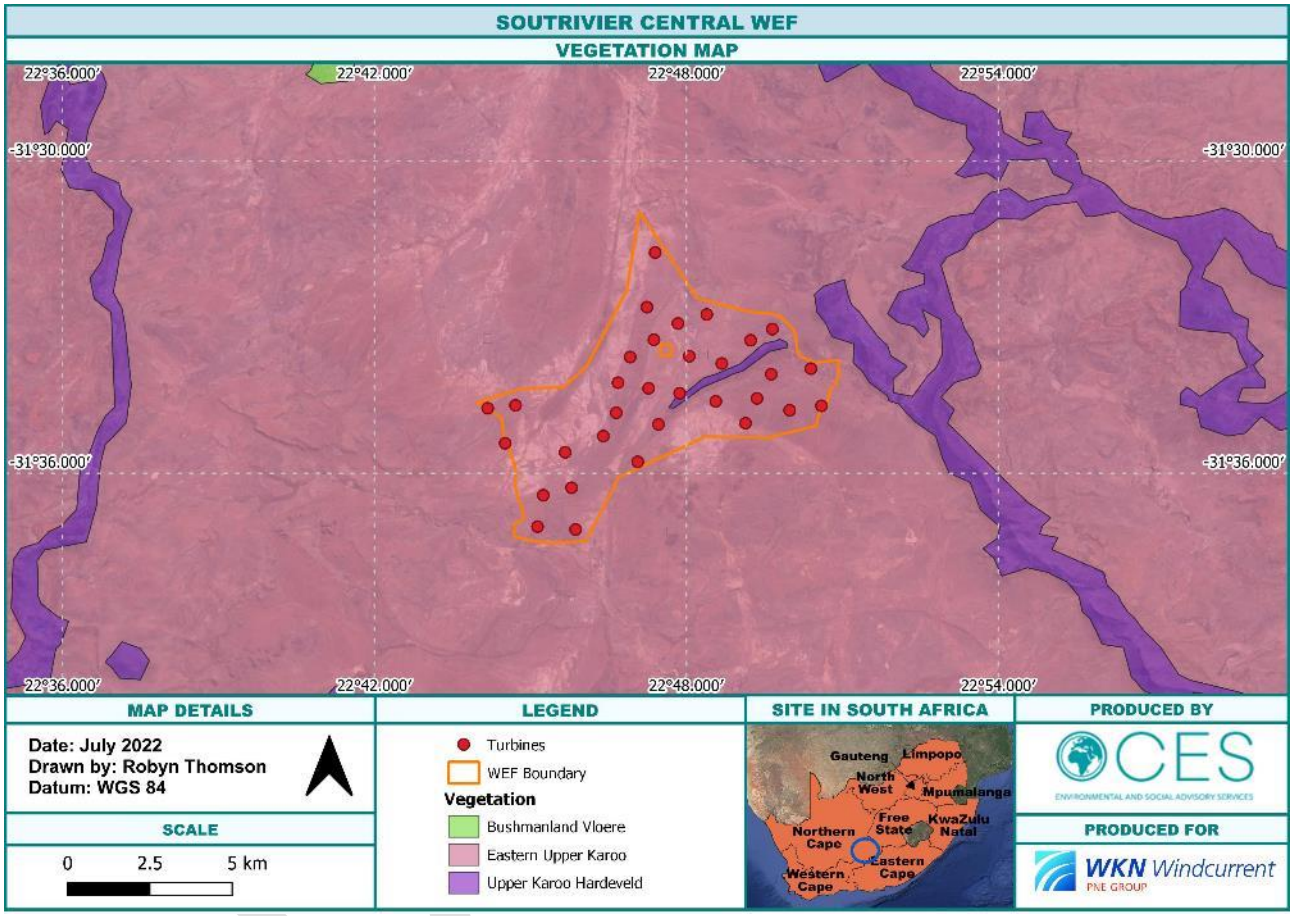

Figure 3-4: National Vegetation Map for the proposed Soutrivier Central WEF site area.

3.10.2 CRITICAL BIODIVERSITY AREAS

As indicated in the baseline ecological assessment at Section 5 of this Scoping Report, most of site area is designated as CBA2, with a small patch designated CBA1 on the western side. Development of CBA 1 area should be avoided as far as possible. It is likely that development within CBA 1 and 2 cannot be avoided. Respective authorities may require consideration of Biodiversity Offsets.

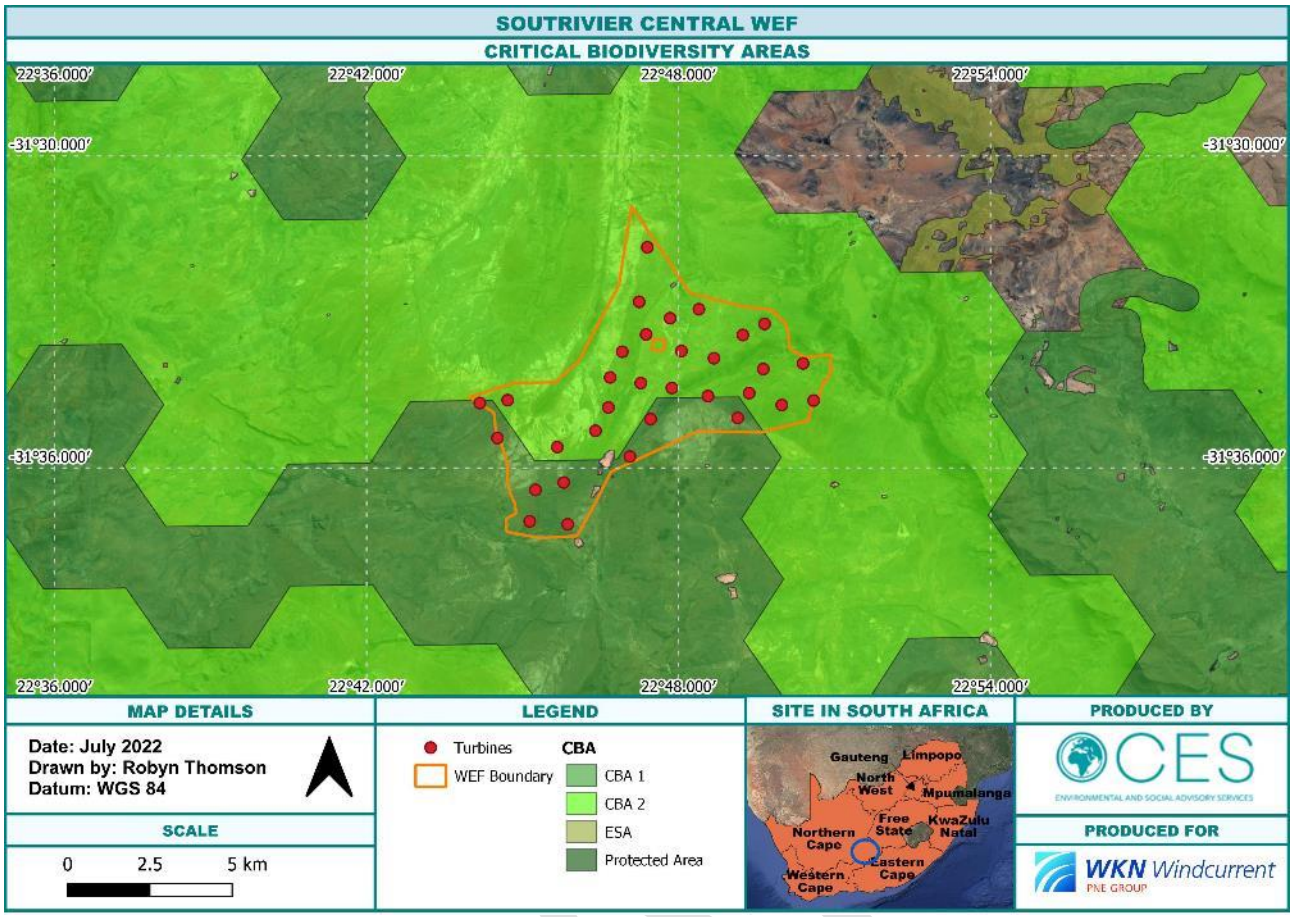

Figure 3-5: Northern Cape Critical Biodiversity Areas.

3.10.3 PROTECTED AREAS

As indicated in the baseline ecological assessment at Section 5 of this Scoping Report, no protected areas are located on the proposed WEF site (Figure 3-6). However, the area between Victoria West and Loxton has been identified by NCPAES as a Primary Focus area. The reasoning for the priority status is based on the fact that this area forms a key ecological link between major protected areas and is important as a climate change corridor. (Oosthuysen et al. 2017). The project site falls within this region and as such this further highlights the conservation status of the area and the need to reduce impacts to an acceptable level. Please note that based on maps extracted from Oosthuysen et al. 2017 the proposed WEF is situated within the Upper Karoo Primary Focus Area (Figure 3-7) and within the Conservancies in the Upper Karoo facilitated by EWT (Figure 3-8). These are initiatives which have been put in place for the conservation of the riverine rabbit. It must be noted that a riverine specialist has been appointed as part of this process and that they have been engaging with EWT throughout their monitoring and assessment campaign.

There are no provincially legislated Protected Areas occurring within the study area (Figure 3-6).

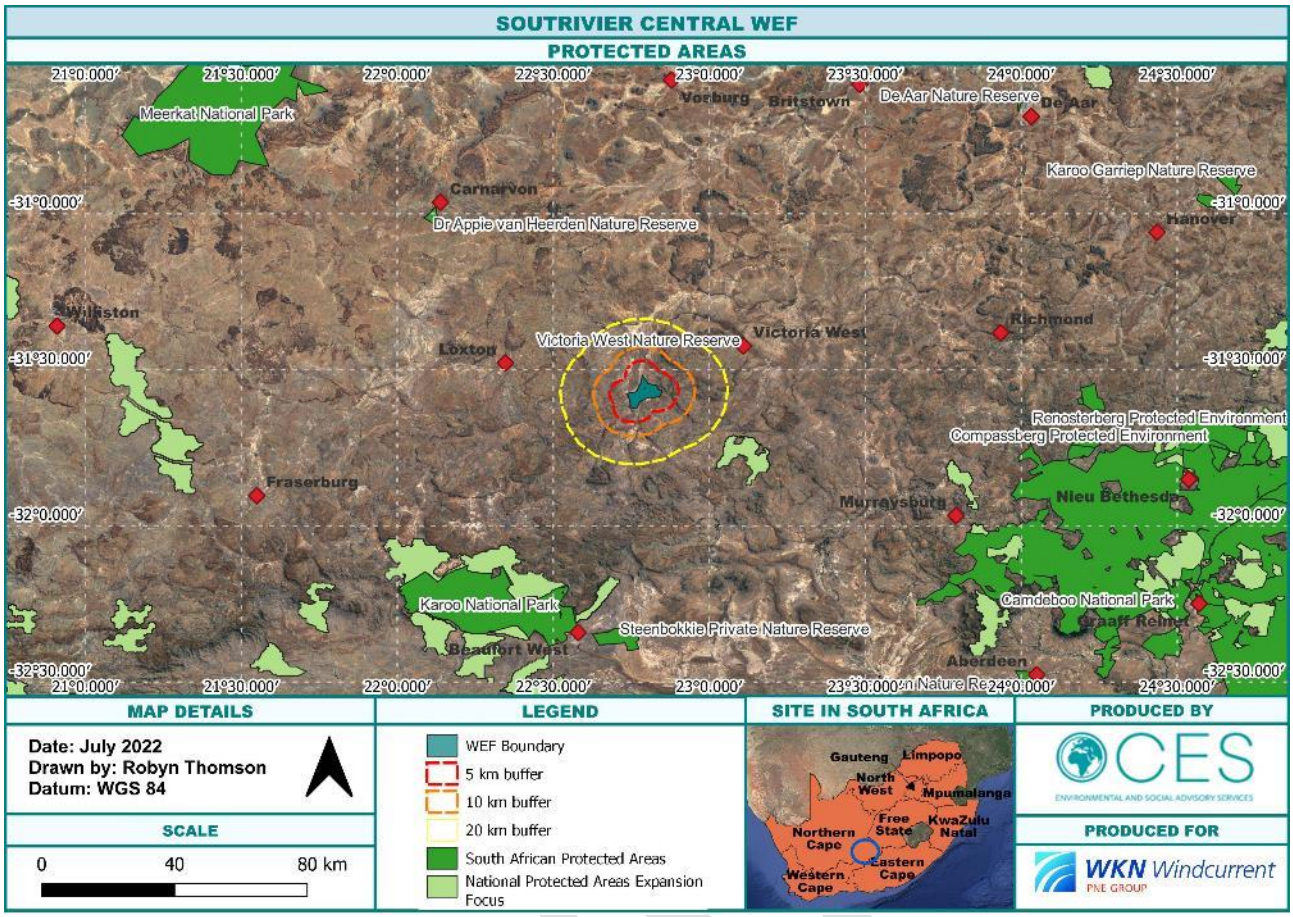

Figure 3-6: Legislated Protected Areas in or around the proposed WEF site.

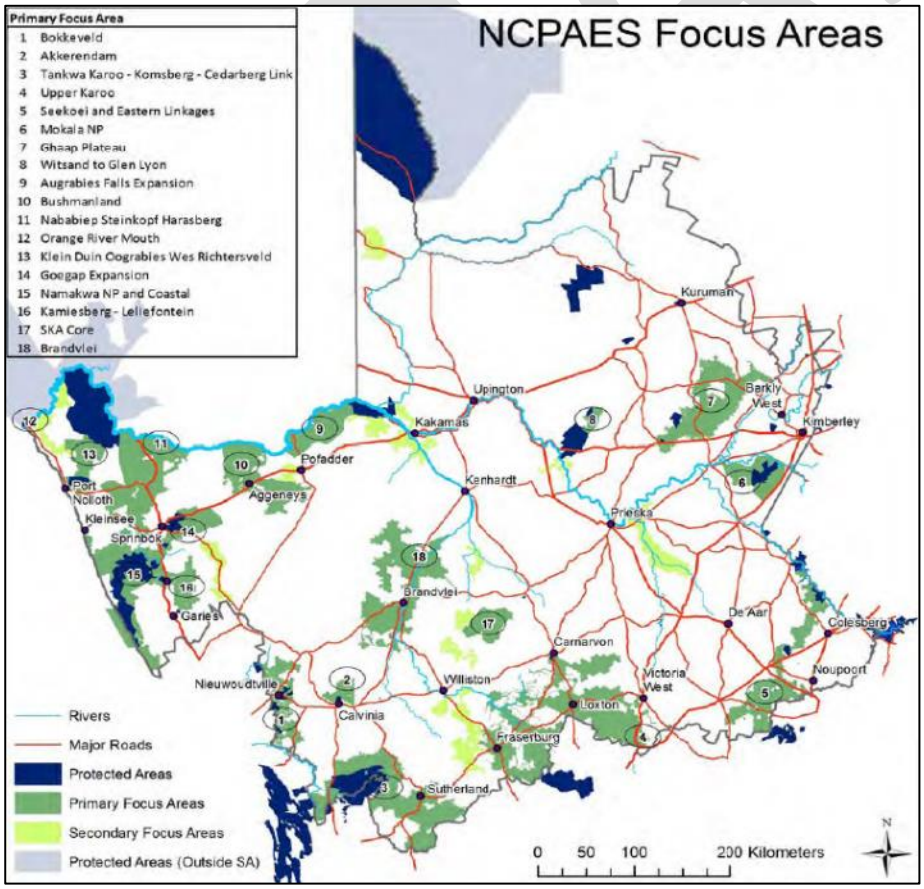

Figure 3-7: NCPAES Focus Areas (Oosthuysen et al. 2017).

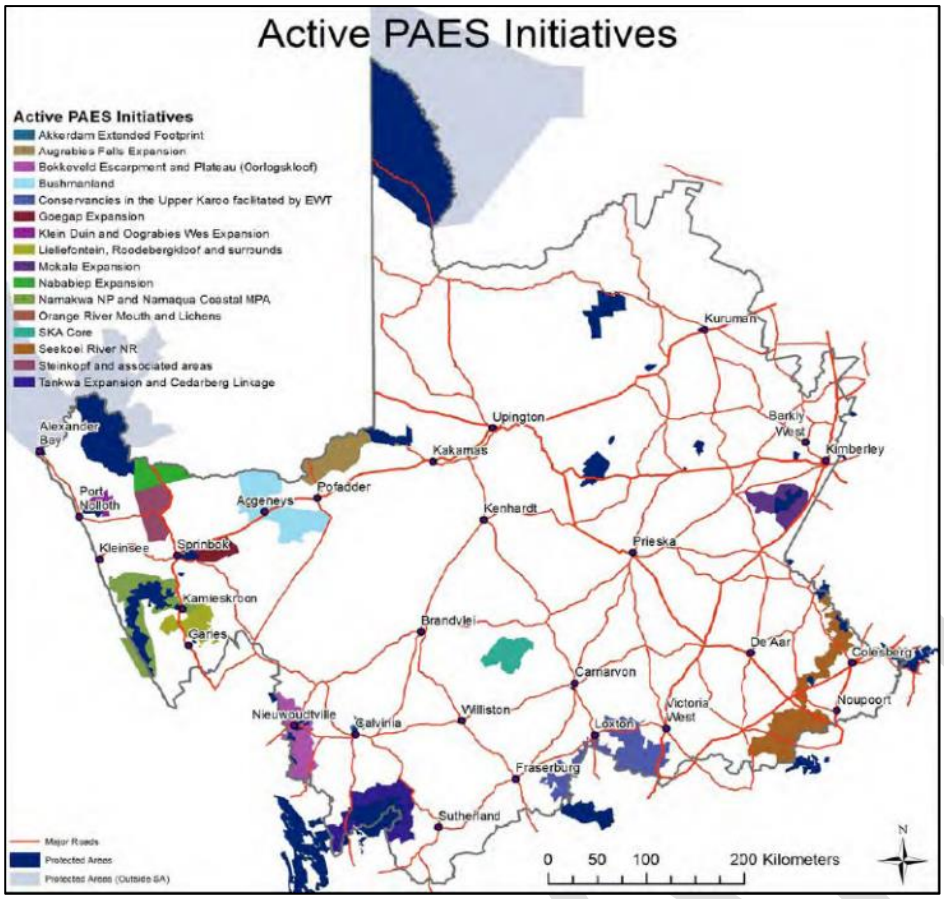

Figure 3-8: Active PAES Initiatives (Oosthuysen et al. 2017).

3.11 CONCLUDING REMARKS

The Northern Cape is the largest Province in the country while also being the least densely populated. It is 6th on the list of provinces in terms of GDP but holds a unique advantage in that it is one of the best sites in the world to produce renewable energy and this potential has attracted to the province a large number of investors under the DoE's Renewable Energy Independent Power Producer Procurement Programme (RE IPP).

When considering the overall need for the development of the proposed WEF, it is clear that the need and desirability is not only supported from a planning and policy perspective on a national level but also at the provincial, district, and most importantly, the 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;
- Job creation within an 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 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. REIPPP local content requirements can lead to the creation of local industry and both skilled and un-skilled jobs in the RE industrial sector.

Further positive social and socio-economic benefits will be realised by the landowners which will host turbines, in the form of rental income which in turn will have multiplier effects on the local economy due to local spend. In addition, farming activities can continue alongside the wind turbines, while rental income may also be used to enhance farming activities.

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 could be particularly applicable due to potential negative impacts on biodiversity conservation initiatives in the affected area (such as the NPAES) and on the commercial activities such as tourism, that rely on the scenic value of the area to attract tourists. These aspects need to be thoroughly investigated in the EIR phase of the EIA process.

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4 RELEVANT LEGISLATION

The development of the proposed Soutrivier Central 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 SOUTRIVIER CENTRAL 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 National Environmental Management Act (NEMA, Act No. 107 of 1998) provides for 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 SOUTRIVIER CENTRAL 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 SOUTRIVIER CENTRAL WEF

The Soutrivier Central WEF is not within close proximity to any formal protected 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 National Environmental Management Act 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 SOUTRIVIER CENTRAL 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 SOUTRIVIER CENTRAL 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 SOUTRIVIER CENTRAL 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 SOUTRIVIER CENTRAL 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, Fisheries and the Environment (DFFE) 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 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 SOUTRIVIER CENTRAL WEF

- *SAHRA must be informed of the project and EIA process.*
- *A Heritage Impact Assessment (HIA) must be undertaken by a suitably qualified specialist.*
- *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 SOUTRIVIER CENTRAL 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 Soutrivier Central WEF. These cover, among other issues, noise and lighting.

RELEVANCE TO THE PROPOSED SOUTRIVIER CENTRAL 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”.

Of importance to the proposed Soutrivier Central WEF project are the following:

- Wind farm placement: Due to the potential of wind turbine generators to interfere on radio navigation equipment, no wind farm should be built closer than 35 km from an aerodrome. In addition, much care should be taken to consider visual flight rules routes, proximity of known recreational flight activity such as hang gliders, en-route navigational facilities etc.
- Wind farm markings: Wind turbines shall be painted bright white to provide the maximum daytime conspicuousness. The colours grey, blue and darker shades of white should be avoided altogether. If such colours have been used, the wind turbines shall be supplemented with daytime lighting, as required.
- Wind farm lighting: Wind farm (3 or more units) lighting: In determining the required lighting of a wind farm, it is important to identify the layout of the wind farm first. This will allow the proper approach to be taken when identifying which turbines need to be lit. Any special consideration to the site’s location in proximity to aerodromes or known corridors, as well as any special terrain considerations, must be identified and addressed at this time.
- Turbine Lighting Assignment: The following guidelines should be followed to determine which turbines, need to be equipped with lighting fixtures. Again, the placement of the lights is contingent upon which type of configuration is being used.

RELEVANCE TO THE PROPOSED SOUTRIVIER CENTRAL 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 take into account 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.
  - 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 Affairs (DWA) 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.

*** PLEASE NOTE THAT GENERAL AUTHORISATIONS (GAS) AND WULAS ARE ONLY AUTHORISED TO BE SUBMITTED TO DWS ONCE A WIND ENERGY FACILITY HAS BEEN GRANTED PREFERRED BIDDER STATUS. SHOULD SOUTRIVIER CENTRAL WEF BE GRANTED PREFERRED BIDDER STATUS THEN WULAs WILL BE SUBMITTED FOR CONSIDERATION BY THE DWS.**

RELEVANCE TO THE PROPOSED SOUTRIVIER CENTRAL WEF

There may be certain instances where the WEF developer may need to obtain approval in terms of the Water Act.

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 maintaining production potential of land provided for in CARA, 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 SOUTRIVIER CENTRAL WEF

The proposed Soutrivier Central WEF site is not deemed to be situated on high agricultural land with high potential. Preventative measures must be considered as part of the EMPr to ensure that farmers are able to continue using their land as livestock grazing as far as possible.

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 SOUTRIVIER CENTRAL WEF

Approval will be required from the DFFE 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)

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 Department of Minerals Resources (DMR) 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 Environmental Management Programme (EMPr)
Mining Right (Licence)	> 1.5 ha	< 30 years	EIA: Scoping and EIA Environmental Management Programme (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 SOUTRIVIER CENTRAL 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 Soutrivier Central 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 DEA, 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 SOUTRIVIER CENTRAL 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 particular relevance to the proposed Soutrivier Central WEF development the following requirements of the Act need to be considered:

RELEVANT SECTION OF THE ACT	RELEVANT TO THE PROPOSED SOUTRIVIER CENTRAL WEF:
Section 3: Fire Protection Associations.	The proposed Soutrivier Central 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 Soutrivier Central 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 Soutrivier Central WEF must have the appropriate equipment, protective clothing and trained personnel for extinguishing fires.

4.18 Other Relevant National Legislation

Other legislation that may be relevant to the proposed Soutrivier Central 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 species of special concern 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 EIA. However, for the purposes of completeness, these include:

- 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).

- Ubuntu Local Municipality Spatial Development Framework (SDF), Integrated Development Plan (IDP) and municipal by-laws.
- Pixley Ka Seme District Municipality SDF and IDP.

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5 DESCRIPTION OF THE ENVIRONMENT: BIOPHYSICAL

The following chapter outlines the biophysical features of the property portions on which the proposed Soutrivier Central WEF is being proposed.

5.1 GEOLOGY AND LANDFORM

The Northern Cape Province is the largest in South Africa, with an area of 372,889 km². While the province contains a wide variety of landscapes it is dominated by the Karoo Basin and consists mostly of sedimentary rocks and some dolerite intrusions.

5.2 TOPOGRAPHY

The project site is located to the West of Victoria West within the Ubuntu Local Municipality. This area is dominated by flats with gently sloping plains. The area known as the Upper Karoo Hardeveld in the west is interspersed with hills and some rocky areas. The average height range of for this area is between 1000-1700masl.

5.3 GEOLOGY

The geology of the project site is mostly dominated by horizons of dolerite rocks. Dolerite covers approximately 36% of the Greater Pixley Ka Seme area, followed by Tillite (12%) and the rock types Sand, Andesite, and Quartzite covering between 7% and 5% of the area respectively. The remainder of the rock types cover less than 4%. (Pixley Ka Seme District SDF 2007)

Overall, the region's rocky areas and hilltops are mostly caved sandstone with a shallow covering of loose sandy soils. The lower lying areas, flatter slopes and undulating territory have deeper layers of loose sandy top soils that are underlain either by decomposed shale, mudstones or sandstones. Over time those areas dominated by shale deposits have decomposed turning into clay. In many of the areas where the drainage is poor it is found that the underlying soils consist of decomposed clay minerals. These clays have been known as to be problematic when it comes to buildings, often resulting in cracks and shifting.

The project area itself is in the Southern Portion of the Pixley Ka Seme Municipality and is mostly underlain by Mudstone. This area is characterised by sedimentary rocks that are built up of particles originating from the weathering of other rocks and deposited in one or another depositional basin. Clay-sized particles (referred to as Mud) are transported in suspension in water and eventually settle in freshwater lakes. After compaction and cementing this results in what is referred to as mudstone. Mudstone occurs after a process of coarse-grained sandstone alternating with fine-grained mudrock. The most widespread occurrence is in the Karoo strata, which covers 75% of the central subcontinent. This mudstone weathers to a clayey soil, which may have expansive characteristics depending on the origins of the soils from which the rock formed. In some areas mudrock is weathered to great depths. The soils are usually highly erodible and dispersive. The soils in this area are highly dispersive and this result in deep dongas forming on many slopes in the Karoo.

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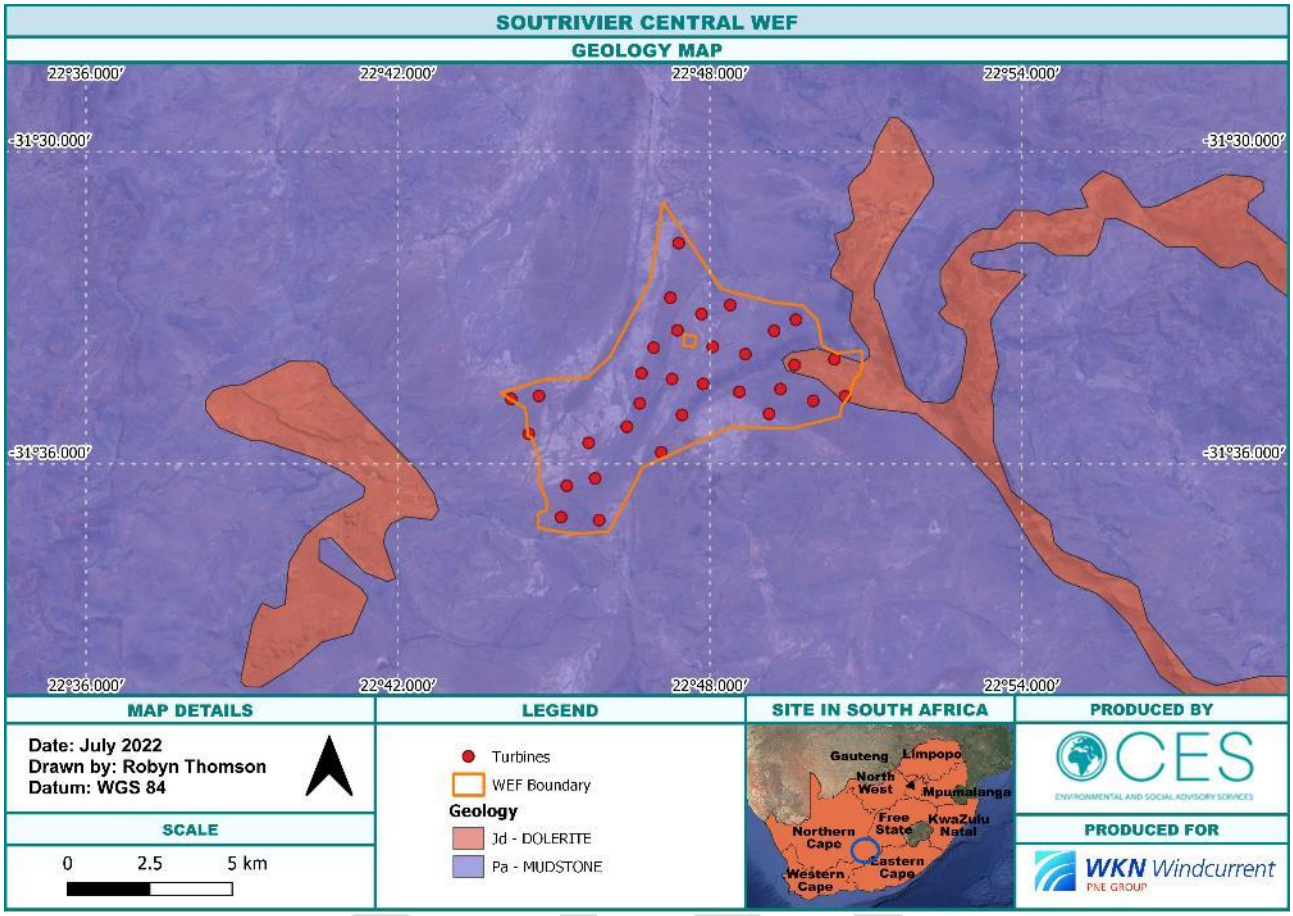

Figure 5-1: Geology Map of the Soutrivier Central WEF site.

5.4 CLIMATE

Due to the large size of the Northern Cape Province the climate profile is complex and varies greatly from the coastal to the inland regions. The weather in the Victoria West and Loxton area is influenced by the local steppe climate, meaning there is little rainfall throughout the year with the peak being between Autumn and Summer. January and March generally experience the highest levels of precipitation. (en.climate-data.org)

The area surrounding Victoria West and Loxton and the project site experiences seasonally high winds. The highest average wind speeds are between June and February, with average ground level wind speeds of more than 17km per hour. The windiest month of the year in the area is November, with an average ground level hourly wind speed of 19km per hour (weatherspark.com)

Table 5-1 Soutrivier Central WEF General Climate Table (Source: en.climate-data.org).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Temp (°C)	23.1	22.8	20.6	16.0	12.3	8.6	8.4	10.6	14.2	17.6	19.8	22.2
Min. Temp (°C)	15.1	15.3	13.5	9.6	6.2	2.6	2.1	3.3	6.1	9.2	11.1	13.9
Max. Temp (°C)	30.6	30.1	27.7	22.5	18.8	15.2	15.3	17.9	21.9	25.3	27.6	30.0
Precipitation / Rainfall (mm)	40	37	40	25	16	11	10	11	12	20	23	30

5.5 HERITAGE FEATURES

5.5.1 ARCHAEOLOGY

The history of the Northern Cape Province is reflected in a rich archaeological landscape, mostly dominated by Stone Age and Colonial Period occurrences. In addition to prehistoric remnants, the archaeological record reflects the development of a rich colonial frontier, characterised by farming and later, a number of war conflicts, particularly the Anglo Boer War (or the South African War) left behind the remnants of battlefields, skirmishes and concentration camps.

The archaeology of the Northern Cape is rich and varied covering long spans of human history. Some areas are richer than others, and not all areas are equally significant. According to Humphreys (1987:117), `the amount of archaeological research that has been undertaken in the Karoo is in no way proportional to its importance in terms of area in South Africa'. While it is true to say that this part of the Karoo has probably been relatively marginal to human settlement for most of its history, it is in fact exceptionally rich in terms of Stone Age and rock art (Beaumont & Morris 1990; Morris and Beaumont 2004). Archaeologists from the McGregor Museum in Kimberley have focussed much of their attention on the Upper Karoo region and the northern periphery of the Karoo, where most of their academic research has been done. A few Archaeological Impact Assessments have been undertaken (as part of the EIA process) in Victoria West and De Aar (Morris 2000, 2004, 2006, 2007, 2010, 2012, 2019), where these have been required.

Contrary to its arid appearance, the Karoo had a relatively high carrying capacity and teamed with game long before European Colonization. Hunter gatherers (mainly San) successfully occupied the central interior of South Africa during the last 4500 years, subsisting on the large herds of grazing animals that occurred during that time (Sampson 1985; Sampson et al 1989). Late Stone Age archaeological sites dating to the late Holocene (within the last 4000 years) are surprisingly common. Although the Karoo is presently more suited to the keeping of small stock such as sheep and goats, research in the Eastern Karoo has revealed that, at about 1200 – 1400 AD, a climatic fluctuation (known as the Little Ice-Age) may well have caused an increased rainfall in the central Karoo resulting in the area being more suitable for grazing of cattle and occupation by Khoekhoen pastoralist groups. They left behind an archaeological legacy that consists of stone kraal complexes of which several hundred have been recorded in the Zeekoe Valley in the eastern Karoo and the Riet River area in the Northern Cape (Hart 1989). The indigenous people of Karoo waged a bitter war against colonial expansion as they gradually lost control of their traditional land. With the implementation of the commando system in the late 18th and early 19th centuries, the Karoo "Bushmen" were eventually destroyed or indentured into farm labour (Hart 1989).

Remnants of Stone Age archaeology in this landscape are mainly MSA and LSA tools. These tool scatters are often found spread very thinly and unevenly on the surface. MSA tools comprise mainly thick chunky flakes, chunks, flaked chunks, blade tools and a few retouched flakes mostly on weathered hornfels/lydianite. LSA lithics often comprise mostly unmodified, utilized and retouched flakes, chunks and cores on un-weathered hornfels. Formal tools such as scrapers, points and adzes are found in these contexts. In certain instances, the stone tools occur in association with organic remains or other cultural remains such as pottery or ostrich eggshell or even potable art. Rock art in the form of engravings on large boulders – often dolerite – as well as stone "gongs" are often found in these areas on rock outcrops and koppies. For example, Kaplan (2010) located several rock engravings on the Swartkoppies Mountains near Britstown northeast of the project areas where imagery of eland and ostriches were pecked on dolerite boulders.

Depending on the range, extent and integrity of site and artefact contexts, the significance of archaeological remains ranges from low to high on a regional level.

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5.5.2 Historical/Colonial Period

The first "Trekboers" moved through the landscape during the early 19th century but it was only in 1843 that Victoria West was laid out on the bank of the Brakrivier watercourse when the Dutch Reformed Church bought the farm Zeekoegat from the estate of J.H. Classens. In 1859 the town acquired municipal status and it became an important staging point along the Diamond Way linking Cape Town with the diamond fields in Kimberley and later the gold fields along the Witwatersrand. In addition, the region became well known for sheep farming and the landscape was divided into farms towards the end of the 1800's. As a result, important historical remnant in this area are farmsteads and associated features. Farmsteads are complex features in the landscape made up of different yet interconnected elements. Typically, these farmsteads consist of a main house, gardens, outbuildings, sheds and barns, with some distance from that labourer housing and family cemeteries. Farm buildings are generally single storied but town houses often reached two floors. Walls are thick and built with stone and the ridged roof, thatched or tiled, are terminated at either end by simple linear parapet gables. In some instances, outbuildings would be in the same style as the main house, if they date to the same period. Roads and tracks, stock pens and wind mills occur on farms across the project landscape.

Farms also hold the remains of "veewagtershuise" or shepherd's huts, typically single roomed buildings constructed out of undressed sandstone blocks. The huts occur in the veld where they served as temporary shelter for livestock shepherds. Material culture such as glass, metal fragments and fragments of ceramics and earthenware are often found at these sites. Infrastructure and industrial heritage such as roads, bridges, railway lines, electricity lines and telephone lines are also feature in this landscape. In addition, infrastructure associated with the Anglo Boer War (fortifications, block houses – e.g. at Merriman, the remains of field hospitals, burial sites) occur around Victoria West.

Historical / Colonial Period remnants are generally viewed to have a medium to high significance on a regional level.

5.5.3 Graves/Cemeteries

Apart from the formal cemeteries that occur in municipal areas (e.g. in Victoria West), informal burial sites occur in the project landscape. These might range from family graveyards at farmsteads to individual unmarked graves in the veld and war graves.

The various cemeteries, burial places and graves are viewed to have a high significance on a local level.

5.6 Palaeontological Context of the Area

The Middle to Late Permian Abrahamskraal and Teekloof Formation bedrocks in the combined Victoria West Cluster and Grid Connection study area are characterised by fossil assemblages of the Tapinocephalus and Endothiodon Assemblage Zones (the latter was previously termed the Pristerognathus and Tropidostoma Assemblage Zones (Kitching 1977, Keyser & Smith 1977-78, Rubidge 1995, Rubidge 2005, Van der Walt et al. 2010, Smith et al. 2012, Smith et al. 2020, Day & Rubidge 2020b, Day & Smith 2020). They include a wide range of fossil tetrapods - especially reptiles and therapsids ("mammal-like reptiles" or protomammals"") - as well as fish, amphibians, plant remains (e.g. petrified wood, plant compressions), microfossils and trace fossils (e.g. vertebrate and invertebrate burrows, trackways).

Only a few historical vertebrate fossil sites are mapped in the vicinity of the project area on the published 1: 250 000 geological map. The Karoo fossil vertebrate site map of Nicolas (2007) shows areas of high as well as low density of fossil records here (Fig. 4). Important concentrations of fossil sites are known, for example, as a result of a long history of palaeontological fieldwork in the Biesiespoort area as well as around Melton

Wold. Recent palaeontological fieldwork by the present author for WEF project areas in the broader Loxton – Victoria West – Beaufort West region (e.g. Nuweveld WEFs, Hoogland WEFs, Modderfontein WEF) and earlier research by other Karoo palaeontologists (e.g. Smith 1993) suggest that numerous unrecorded fossil sites of scientific and conservation value are likely to occur here. New tetrapod fossil finds within the project area should help resolve outstanding lithostratigraphic ambiguities in the region as well as contributing to on-going scientific research concerning palaeoenvironmental and evolutionary events before and during the catastrophic end-Middle Permian Extinction Event of c. 260 million years ago as well as during the succeeding biotic recovery (Retallack et al. 2006, Day et al. 2015).

Most of the varied Late Caenozoic superficial sediments within the project area are largely of low palaeosensitivity. However, relict consolidated older (Neogene / Pleistocene) alluvial deposits along drainage lines may contain sporadic fossil assemblages of mammals (bones, teeth, horn cores), freshwater invertebrates and trace fossils.

Preliminary mapping using the DFFE Screening Tool as well as SAHRIS indicates that most of the combined Taaibos/Soutrivier Cluster and Grid Connection projects area is of Very High Palaeosensitivity. Thick alluvial deposits are assigned a Medium Sensitivity while dolerite intrusions are insensitive (i.e. unfossiliferous). Based on recent experience with WEFs in the broader region, this preliminary palaeosensitivity mapping is likely to be contested following the planned field-based palaeontological surveying. While fossil sites of high palaeontological and conservation value are almost certain to occur within the Taaibos/Soutrivier Cluster and Grid Connection project areas, they are probably very sporadic in distribution.

5.7 LANDCOVER

The site visit illustrated that the project area is used for various activities such as livestock farming, game farming and households.

Figure 5-2 illustrates the landcover of the Soutrivier Central WEF site and surrounding areas (Northern Cape Land Use Data, AGIS).

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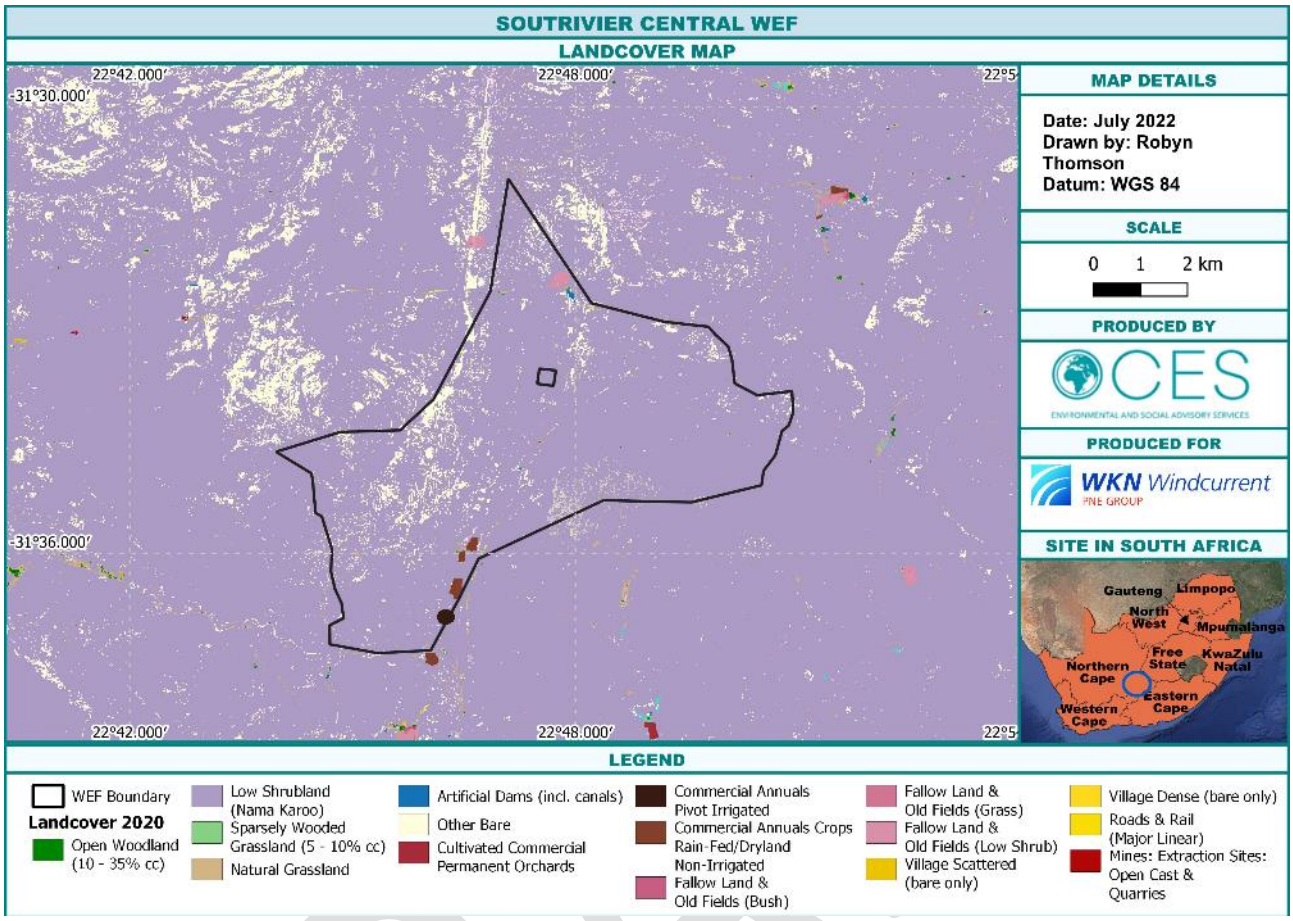

Figure 5-2: Landcover Map of the Soutrivier Central WEF site and surrounding areas.

5.8 VEGETATION & FLORISTICS

The greater Nama-Karoo Biome of which the project area forms part of, is the third largest biome in South Africa, covering approximately 20.5% of the country. It stretches across the central plateau of the western half of the country. It is classified as semi-arid with the majority of vegetation being deciduous plants, low shrubs and grasses.

The Pixley Ka Seme District Municipality is located towards the Eastern extent of the Nama- Karoo Biome and is in itself a unique biodiversity area. The area around the project site is mostly rural and these areas are dominated by natural vegetation that, although classified as hardy due to the limited rainfall that supports it, can be sensitive and slow to recover and rehabilitate if not managed suitably.

Nama-Karoo covers 87% of the area in the Pixley Ka Seme District and forms the transition area between the Cape flora area to the south and the tropical savanna areas in the north. Many of the plant species of the Nama-Karoo also occur in the savanna, grassland, succulent Karoo, and fynbos biomes.

5.8.1 SANBI VEGETATION MAP

Mucina and Rutherford (2006) developed the National Vegetation map as part of a South African National Biodiversity Institute (SANBI) funded project: "It was compiled 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 was developed using a wealth of data from several contributors and has allowed for the best national vegetation map to date, the last being that of Acocks developed over 50 years ago. The SANBI Vegetation map informs finer scale bioregional plans such as STEP. This SANBI Vegmap project has two main aims:

- "to determine the variation in and units of southern African vegetation based on the analysis and synthesis of data from vegetation studies throughout the region, and
- to compile a vegetation map. The aim of the map was to accurately reflect the distribution and variation on the vegetation and indicate the relationship of the vegetation with the environment. For this reason the collective expertise of vegetation scientists from universities and state departments were harnessed to make this project as comprehensive as possible."

The map and accompanying book describes each vegetation type in detail, along with the most important species including endemic species and those that are biogeographically important. This is the most comprehensive data for vegetation types in South Africa. According to this spatial planning tool, 3 vegetation types are found to occur within the greater project area.

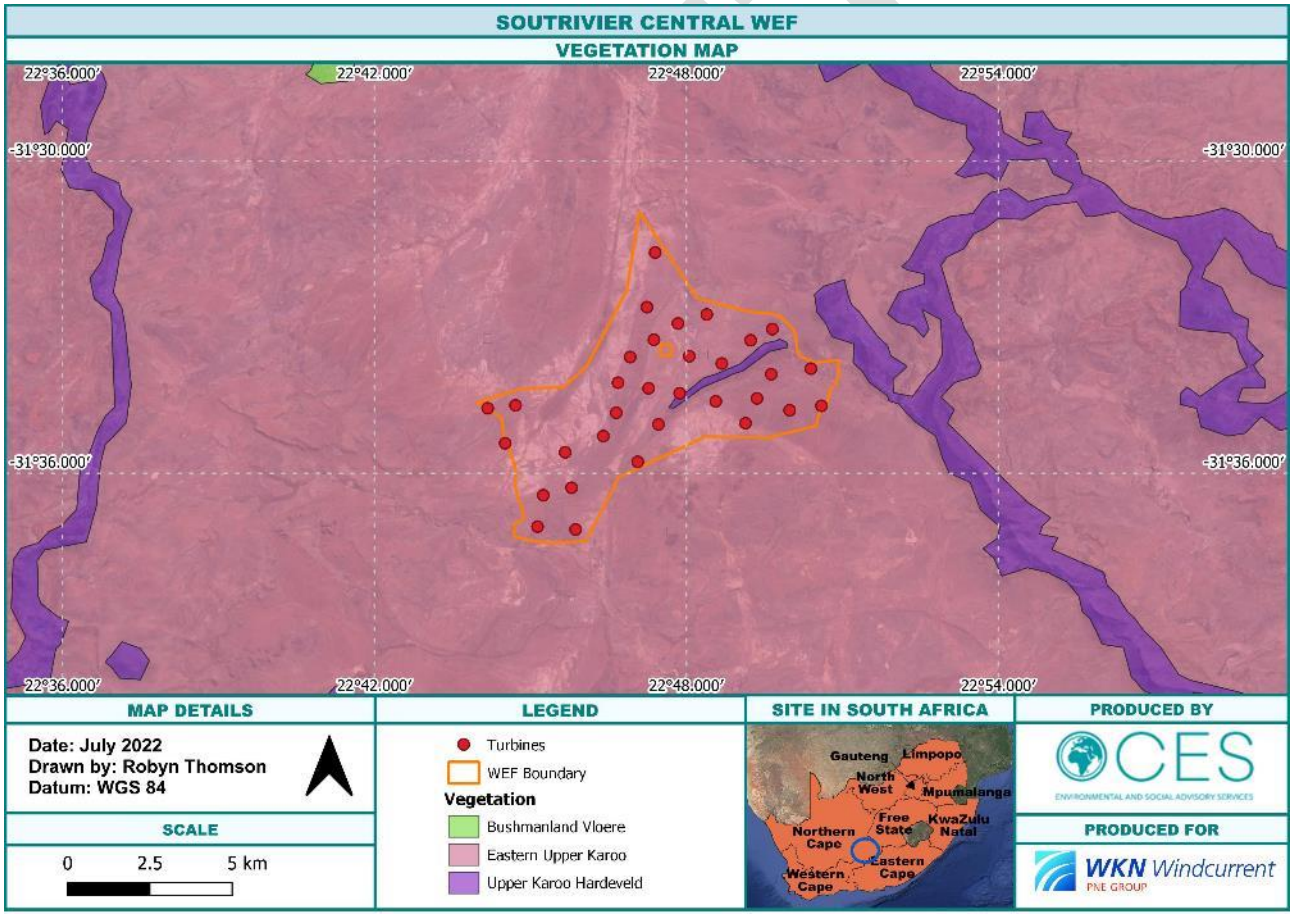

Figure 5-3: SANBI Vegetation Map of the Soutrivier Central WEF site and surrounding areas.

a

A) Upper Karoo Hardeveld

This vegetation type is found throughout the Northern, Western and Eastern Cape Provinces and is characterised by discrete areas of slopes and ridges. This unit is generally found between 1 000–1 900 masl. The Steep slopes of these koppies and ridges are often covered with large boulders and stones which supports sparse dwarf Karoo scrub along with drought-tolerant grasses of genera such as *Aristida*, *Eragrostis* and *Stipagrostis.* (Mucina and Rutherford, 2006) Upper Karoo Hardeveld is classified as LEAST THREATENED with a conservation target of 21%. There is only approximately 3% statutorily conserved in Karoo National

Park and Karoo Nature Reserve. While this is one of the richer floras found within the Nama Karoo Biome its only forms a small part of the project site.

B) Eastern Upper Karoo

The Eastern Upper Karoo vegetation type covers the entire project site and consists of flats and gently sloping plains. These areas are often interspersed with the koppies and ridges of the Upper Karoo Hardeveld as described above. The flora is dominated by dwarf microphyllous shrubs with typical white grasses of the genera *Aristida* and *Eragrostis*. Grass cover is seasonal and becomes more prominent after heavy rainfall (generally from late autumn to summer). This vegetation type is considered LEAST THREATENED with a conservation target of 21%. There are however statuary conservation targets within a number of National Parks and protected areas.

5.9 NORTHERN CAPE CRITICAL BIODIVERSITY AREAS

Critical Biodiversity Areas are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan. Ecological Support Areas are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. The CBAs for each province have been compiled based on extensive biological data as well as input from key stakeholders. While the CBAs are a high-level reflection of the conditions expected it is imperative that the actual status of the environment be determined.

1. Critical Biodiversity Area 1 (CBA 1) – CBA 1 designated areas are those that have been identified as priority areas to be retained in order to meet conservation targets. The land use guidelines for CBA 1 designated areas recommend no further development. The designation may not necessarily be based on the condition of the habitat, species composition, ecological connectivity or overall ecological value since it is largely based on a statistical analysis process.
2. Critical Biodiversity Area 2 (CBA 2) – As for above, however these areas are deemed to be degraded but deemed priority areas. The land use recommendations for CBA 2 designated areas are broadly speaking restore and maintain to meet conservation targets. Since available area within the site boundaries that is not categorised as CBA 1 or CBA 2 is limited and inadequate, the most suitable or least risky area for utilisation will be the CBA 2 designated areas.

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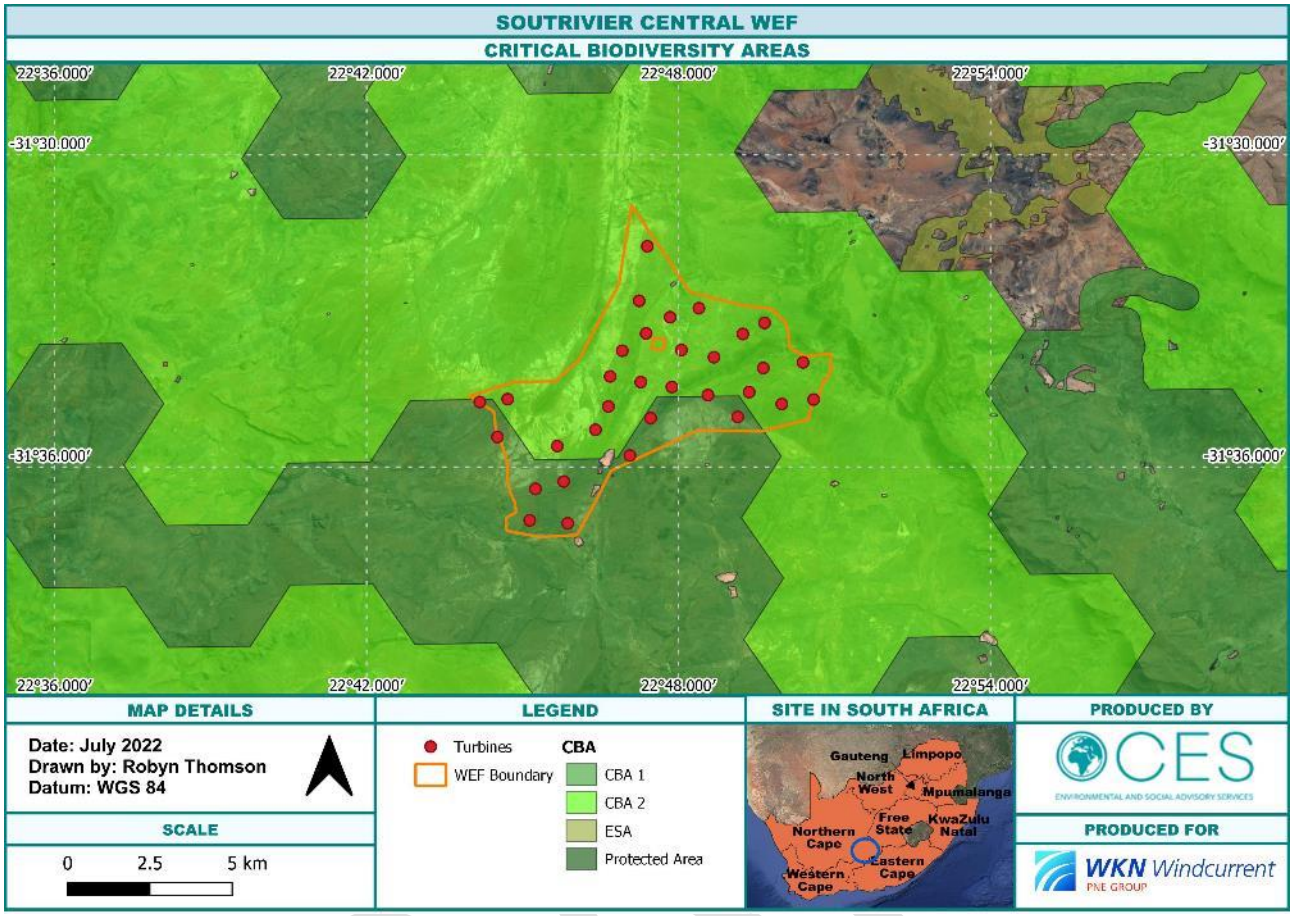

Figure 5-4: CBA Map of the proposed Soutrivier Central WEF site and surrounding areas.

5.10 NORTHERN CAPE PROTECTED AREA EXPANSION STRATEGY

The Northern Cape Protected Area Expansion Strategy (NCPAES) was developed in 2017 based on the current Northern Cape CBA as well as specialist input in order to identify and prioritise protected area expansion for ecological sustainability and increased resilience to climate change. The area between Victoria West in the East and Loxton in the west have been identified by NCPAES as a Primary Focus area. The reasoning for the priority status is based on the fact that this area forms a key ecological link between major protected areas and is important as a climate change corridor. (Oosthuysen *et al.* 2017). The project site falls within this region and as such this further highlights the conservation status of the area and the need to reduce impacts to an acceptable level.

5.11 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.

5.11.1 REPTILES

South Africa has 350 species of reptiles, comprising 213 lizards, 9 worm lizards, 105 snakes, 13 terrestrial tortoises, 5 freshwater terrapins, 2 breeding species of sea turtle and 1 crocodile (Branch, 1998).

Of those 350 reptile species, the Northern Cape is home to 208. According to Reptile Map database the project area is likely to be home to 12 Species (QDS 3122BC, 3122BD, 3122DA, 3122DB)

Consultation of the Animal Demography Unit (ADU) historical records indicates that 62 species of reptiles are likely to occur in the project site. None of these species are conserved under the IUCN and only the Karoo Padlooper *Chersobius boulengeri* is listed as NEAR THREATENED on the National Environmental Management: Biodiversity Act (NEMBA).

5.11.2 AMPHIBIANS

Amphibians are an important and often neglected component of terrestrial vertebrate faunas. They are well represented in sub-Saharan Africa, from which approximately 600 species have been recorded (Frost, 1985). A relatively rich amphibian fauna occurs in the Northern Cape, where a total of 34 species and sub-species occur. Knowledge of amphibian species diversity in the study area is limited. However, according to the Frogmap Database, only two species are likely to occur within Quarter Degree Squares that the project area falls in. (QDS 3122BC, 3122BD, 3122DA,3122DB). Both species are listed as LEAST CONCERN however, all frogs and toads are listed as SCHEDULE II species on the PNCO list and will therefore require permits for their removal.

5.11.3 MAMMALS

Large game makes up less than 15% of the mammal species in South Africa and a much smaller percentage in numbers and biomass. In developed and farming areas, this percentage is greatly reduced, with the vast majority of mammals present being small or medium-sized. The Northern Cape is home to approximately of which the Mammalmap Data base indicates that 21 Species are likely to occur within the project area. Of these 21 species only the Riverine Rabbit *Bunolagus monticularis* is listen as CRITICALLY ENDANGERED. Two other species, the Leopard *Panthera pardus* and the Black-footed Cat *Felis nigripes* are listed as Vulnerable.

5.11.4 AVIFAUNA

The first and second South African Bird Atlas Projects (SABAP1 – Harrison *et al* 1997; SABAP2 – www.sabap2.birdmap.africa) have recorded a combined total of approximately 200 bird species in the broader study area (Appendix 1). These 200 species include: three regionally Endangered species (Ludwig's Bustard *Neotis ludwigii*; Martial Eagle *Polemaetus bellicosus*; & Black Harrier *Circus maurus*); four Vulnerable species (Black Stork *Ciconia nigra*; Verreaux's Eagle *Aquila verreauxii*; Secretarybird *Sagittarius serpentarius*; & Lanner Falcon *Falco biarmicus*); and eight Near-threatened species (Greater Flamingo *Phoenicopterus ruber*; Lesser Flamingo *Phoenicopterus minor*; Karoo Korhaan *Eupodotis vigorsii*; Double-banded Courser *Rhinoptilus africanus*; African Rock Pipit *Anthus crenatus*; Kori Bustard *Ardeotis kori*; Blue Crane *Anthropoides paradiseus*; & Maccoa Duck *Oxyura maccoa*. Approximately 22 of the 200 bird species are endemic or near-endemic, and 68 species are in the top 205 turbine collision risk species identified by Retief *et al*, 2014. Four species are in the top 10 of this priority list: Verreaux's Eagle (#3); Martial Eagle (#4); Black Harrier (#6); and Black Stork (#8). These are likely to be the priority species for the project.

The raptors are probably the most important of the above species due to their proven susceptibility to turbine collisions, and the applicability of species-specific best practice guideline requirements in some cases (to be discussed in more details in the Avifaunal Impact Assessment Report as part of the EIA process). The most important of the raptors at this screening stage are Verreaux's Eagle; Martial Eagle; Black Harrier and Secretarybird. Risk to these species will be highest close to nests.

The large terrestrial species such as Ludwig's Bustard, Blue Crane and Karoo Korhaan are of slightly less concern due to their proven relatively low susceptibility to turbine collisions. Their conservation status does however still warrant attention. These species will typically frequent the flatter parts of site and make use of wetlands, flats, dams, and arable lands.

The closest Important Bird and Biodiversity Area (IBA - Marnewick *et al*, 2015) is approximately 54 kilometres south of the study area, the Karoo National Park IBA. This is too far to have relevance to this assessment at this stage and is not discussed further. It is positive that the proposed project is not in or close to an IBA.

A number of sensitive receptors for avifauna have been identified:

- Dams have been identified as sensitive as they attract various bird species, including perhaps most importantly Blue Crane which roost in flocks in the shallows of dams at night. A buffer of 500m has been placed around all dams identified by the SA NFEPA Wetland layer. Note that although this NFEPA layer is classified as wetlands the ground surveys have revealed that there are a number of man made dams misclassified.
- True wetlands were identified using the NBA2018-Wetlands dataset available on the SANBI BGIS website. This dataset appears to identify true wetlands. At this stage no buffer has been placed around wetlands as we are not familiar with the exact nature of wetlands on this site and their importance for avifauna. Buffers may be imposed later in the project and would likely be similar to those around dams.
- Arable lands are important resources for avifauna for foraging, particularly in winter when the natural veld is dry. We are not aware of a suitable spatial dataset which identifies these areas so they are not mapped at this stage. Fortunately, these areas are mostly close to dams and wetlands and are unlikely to present a significant constraint to development.
- A number of active nests of large priority bird species (Martial Eagle & Verreaux's Eagle) were found on or near site. These nest sites have been afforded spatial protection in the form of No-Go buffers, which have already been considered in the design of the preliminary project layout.

5.11.5 CONSOLIDATED SPECIES OF CONSERVATION CONCERN

The following table is a consolidated list of species of conservation concern which have been observed on the proposed Soutrivier Central WEF site.

Table 5-2: Species of Conservation Concern, Consolidated Table (as per avifaunal and ecological specialist screening).

SCIENTIFIC NAME	FAMILY	STATUS[1]	COMMENT/PRESENCE
MAMMALS			
Bunolagus monticularis (Riverine rabbit)	Lagomorpha	CR, NEST (H, M)	Usually confined to dry riverbeds areas having riparian shrubby vegetation or on the narrow alluvial fringe of seasonally dry watercourses in the Central Karoo. **Riverine Rabbit Study is being undertaken**
Felis nigripes (Black Footed Cat)	Felidae	ToPS, CITIES 1,	Camera trap record confirmed presence near the western edge of the Taaibos site, within proximity of the Soutrivier site. Approximately 1.5 km from a DFFE designated high sensitivity area (outside project footprint). Recommend a buffer around this area, as it may be within foraging range if the nearby high sensitivity area is a known den. Further investigation required as part of the Ecological Impact Assessment.

SCIENTIFIC NAME	FAMILY	STATUS[1]	COMMENT/PRESENCE
			Terrestrial Biodiversity (Ecological) Impact Assessment is being undertaken.
BIRDS			
Aquila verreauxii (Verreaux's Eagle)	Accipitridae	VU, NEST (H, M)	**Avifaunal Monitoring and Impact Assessment is being undertaken.**
Neotis ludwigii (Ludwig's Bustard)	Otididae	EN, NEST (H, M)	
REPTILES			
Chersobius boulengeri (Karoo Padloper)	Testudinidae	NEST (M), ToPS	Widespread and likely to occur sporadically throughout the site. May require taxa specialist input but this species is expected to be found throughout the broader area. **Terrestrial Biodiversity (Ecological) Impact Assessment is being undertaken.**
AMPHIBIANS			
None of Concern			Further investigations will be required, but higher risk areas include riparian and watercourse areas which will be indicated as areas to avoid. **Terrestrial Biodiversity (Ecological) Impact Assessment and Freshwater Impact Assessment are being undertaken.**
INVERTEBRATES			
Orthoptera (Grasshoppers)			
None of Concern			
Lepidoptera (Butterflies)			
None of Concern			
Scorpions and Spiders			
Baboon Spiders & Scorpions		ToPS	Various species likely present **Terrestrial Biodiversity (Ecological) Impact Assessment is being undertaken.**

5.12 Rivers, Watercourses and Drainage Lines

5.12.1 NFEPA Wetlands and Rivers

After several years of development and testing, a National Wetland Classification System (NWCS) was completed in 2013. The South African National Biodiversity Institute (SANBI), through its National Wetland Inventory project, initiated a collaborative process to develop a classification by which wetland habitat types with shared natural attributes can be grouped together. The classification system is intended to be used throughout the country for a number of different applications, with a view to provide wetland specialists, academics, government and other role players with a common language when distinguishing different types of wetlands for management and conservation purposes. The National Wetland Inventory maps are provided by SANBI through National Freshwater Ecosystem Priority Area (NFEPA) wetland maps, which classify the major wetlands and water bodies in the country at a coarse spatial scale. The classification was applied to the wetlands included in the inventory's National Wetland Map after extensive field testing throughout the country and through the National Freshwater Ecosystem Priority Areas (NFEPA) project. Please refer to Figure 5-7 for a map illustrating the NFEPA Wetlands and Rivers.

According to the NFEPA a number of wetlands were found to occur within 500 m of the project boundary. No rivers are found to occur within 32 m of the project area, but numerous drainage lines will be impacted by the proposed Soutrivier Central WEF. Water Use Licences (WUL) will have to be obtained from DWS prior to the commencement of any construction activity within this area.

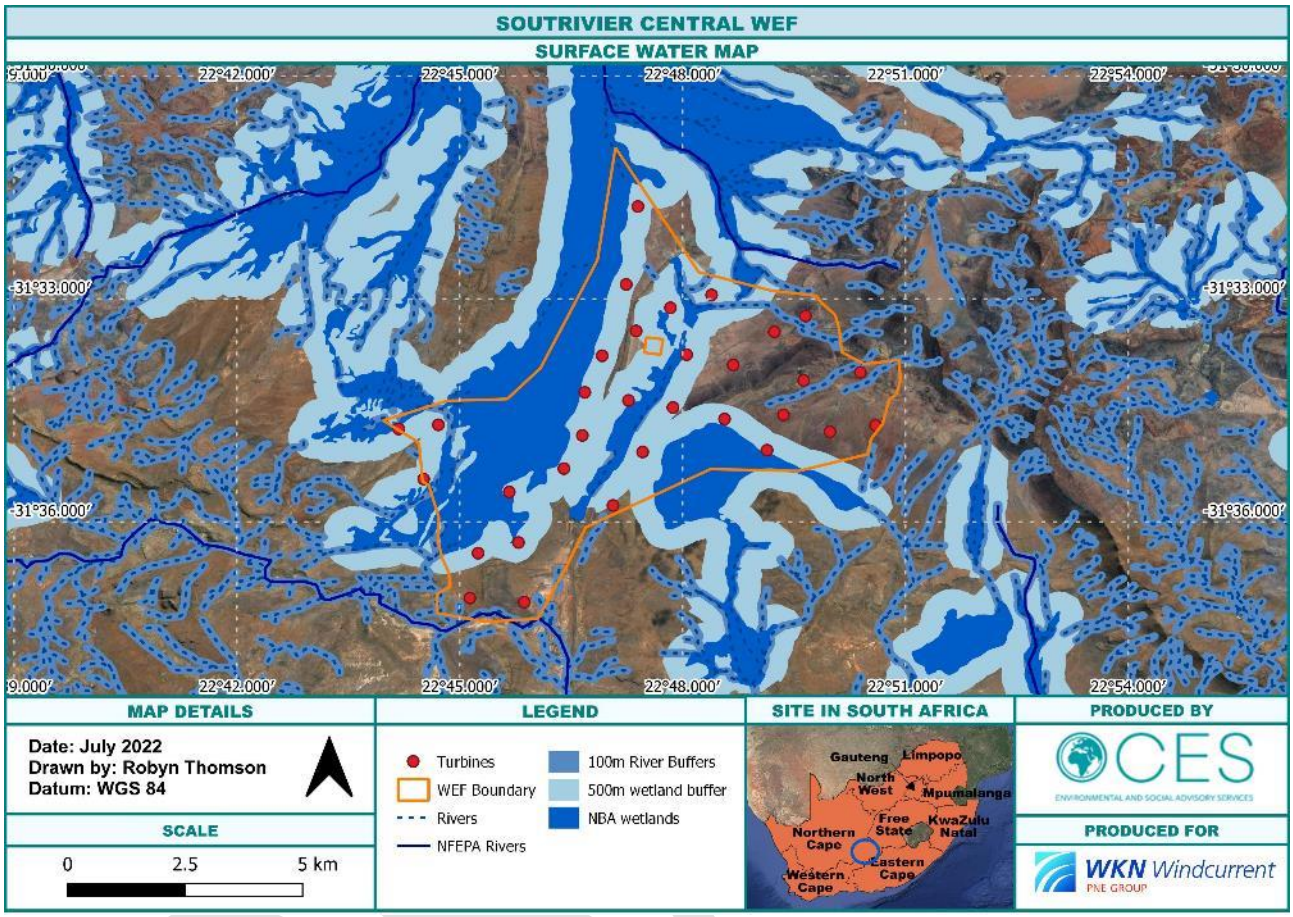

Figure 5-5: Surface Water Map of the Soutrivier Central WEF site and surrounding areas.

The following main wetland types are found within the project boundary (these wetlands will be assessed in the Freshwater Specialist Report:

A) SLOPE SEEP

An inclined stretch of ground that is not part of a valley floor, typically located on the side of a mountain, hill or valley. A slope seep is a wetland area located on gently sloping land dominated by the gravity driven movement of material down-slope. Seeps are generally associated with strong, unidirectional flow of water horizontally. Water input is primarily groundwater or precipitation.

B) VALLEY FLOOR: CHANNELLED VALLEY-BOTTOM WETLAND

Small depressional areas within a channelled valley-bottom wetland can result in the temporary containment and storage of water within the wetland. Water generally exits in the form of diffuse surface flow and interflow, with the infiltration and evaporation of water from these wetlands also being potentially significant

Water bodies play an important ecological role which is associated with the vegetation that is found to occur in these areas, this vegetation plays a role in the improvement of the water quality and the trapping of sediment (Daily,1997). Bulrushes said to be generally beneficial species as they play a role in controlling erosion and filtering mudding floodwaters (Bromilow, 2010).

The maintenance of these water bodies is important as it provides suitable habitat for hydrophytic (water loving) vegetation and riparian vegetation found to occur in the wetland area.

C) VALLEY FLOOR: UNCHANNELED VALLEY-BOTTOM WETLAND

Similar to the Channelled Valley-Bottom as described above but differs in that there is an absence of any distinct channel banks flowing through the wetland and the resulting prevalence of diffuse flows. The inputs for this type of wetland are typically from upstream channels or seepage from adjacent valley side slopes.

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6 DESCRIPTION OF THE ENVIRONMENT: SOCIO-ECONOMIC

6.1 DESCRIPTION OF THE SOCIO-ECONOMIC PROCESS FOR RENEWABLE ENERGY PROJECTS

The Department of Mineral Resources and Energy's ("DMRE's") Renewable Energy Independent Power Producers Procurement Program ("REI4P") implements certain measures to ensure that a portion of the income generated through operational Renewable Energy ("RE") projects is directed towards local economic development. In order to select winning bids, the DMRE uniformly ranks all projects submitted according to a scorecard in which (i) 70% of the score is based on the proposed energy Tariff of the respective projects; and (ii) 30% of the score is based on the Economic Development ("ED") commitments made by the respective projects on the following seven (7) elements:

- Job Creation: Employment of South African Citizens, Black People, Skilled, Unskilled and people residing in the local communities where the project is located;
- Local Content: Components of the facility/project manufactured in South Africa;
- Preferential Procurement: Goods and services procured through South African companies that have a B-BBEE Generic scorecard or who are Qualifying Small Enterprises, Exempt Micro Enterprises and Woman Owned Venders;
- Black Ownership: The percentage of Black Ownership in the project;
- Black Top Management: Senior management that are Black people from the Independent Power Producer within the project;
- Enterprise Development: the monetary rand contributions made towards Enterprises in the local communities as a percentage of the revenue; and
- Socio-Economic Development: the monetary rand contribution made towards socio-economic challenges in the local communities as a percentage of the revenue.

The minimum criteria required for each of these elements do not always stay stagnant and are from time to time adjusted prior to each bidding window commencing.

Jobs and the inflow of funds to the local communities do not occur at once, as the process is staggered. During the bid development phase few project developers liaise with communities and cannot commit to promises in terms of local benefits, as the outcomes of the project proposals are uncertain. In the case of a preferred bidder, and during financial close, consultation will commence and construction will result in the employment of workers. Once operational, SED and ED spent will usually increase.

The Independent Power Producer ("IPP") projects of the first five (5) bid windows (BW1, BW2, BW3, BW3.5, BW4) were distributed across all nine (9) provinces. Up to date, in the Northern Cape Province, the following economic investments and positive socio-economic impacts have been committed (IPPPP Overview, 31 December 2021):

- 48 projects, contributing 3 566 MW (compared with 17 projects in the Eastern Cape; and 11 in the Western Cape);
- Investment (equity and debt) to the value of R139 billion;
- Created 65 249 job-years for South African citizens to date;
- SED and ED contributions of R14 402 million; and
- Shareholding by South African entities and Black South Africans of R15 133 million.

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6.1.1 Identification of the Beneficiary Community

The first step for project developers is usually to identify local communities that will benefit from the renewable energy project. Requirements of the renewable energy independent power producer procurement (REIPPP) programme oblige renewable energy companies to engage with the developmental opportunities and needs of communities around their project sites. The procurement documents define local communities as settlements in a 50km radius around the project site. It is usually the responsibility of the project developer to decide what constitutes the benefitting community. This could be specific villages or towns, or even the entire (qualifying) population within the 50km radius.

6.1.2 Financial and Socio-Economic Contributions

The IPP will ensure community ownership and social responsibility as follow:

- **Community trust**: The mechanism established for the community to hold ownership of projects, which aims to ensure that a portion of the income generated is directed towards local economic development. At this stage at least 2,5% equity should be held by communities.
- **Employment**: The employment requirement ensures that at least 20% of the South African workforce in the Project comes from the local communities. During the construction phase direct benefits therefore mainly pertain to construction related employment opportunities and procurement as well as induced impacts that relate thereto.
- **Socio-economic development ("SED") and Enterprise development ("ED")**: SED contributions are allocated towards activities that facilitate sustainable access to the economy for beneficiaries in the areas of rural development, the environment, infrastructure, enterprises, reconstruction of undeveloped areas, development programmes for women or youth, education, health care, arts and culture. ED refers to contributions to black-owned businesses with the specific objective of assisting or accelerating the development, sustainability and ultimate financial and operational independence of that enterprise. Currently, the target set by the Department in the last version of the tender documents was 2.1% of revenue.

6.2 Stakeholders for the Social Assessment of the Soutrivier Central WEF

Stakeholders within the primary and secondary spheres of influence are identified throughout the public participation and SIA processes. The sphere of influence is determined by the degree of impact that will potentially manifest. Geographic location of the stakeholder can aid the categorisation but does not necessarily award a higher level of impact to a stakeholder that is located in closer proximity to the project. Stakeholders that have been identified thus far as relevant to the SIA include:

- PRIMARY SPHERE OF IMPACT
  - Land owners
  - Ward Councillors
  - Ubuntu Local Municipality

- SECONDARY SPHERE OF IMPACT
  - Adjacent and surrounding landowners
  - Pixley Ka Seme DM (PKSDM)
  - Road users on public and access roads
  - Fire and rescue services
  - Legitimate land claimants, if any
  - Agricultural unions

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- INDIRECT IMPACT SPHERES
  - Labour unions
  - South African Police Service

6.3 BASELINE INFORMATION OF THE STUDY AREA

6.3.1 UBUNTU LOCAL MUNICIPALITY

Ubuntu LM is located on the border between the Northern and Western Cape on the Southern Edge of the Pixley Ka Seme District Municipality. The seat of the LM is in Victoria West, the largest town in the municipality. Two other towns, Loxton and Richmond as well as two railway villages Hutchinson and Merriman make up the only other major developed areas within the municipality. (www.localgovernment.co.za)

In 2011 the Ubuntu LM census put the population for the entire region as 18 601 over an area of 20 389.23 km². The population of Victoria West was the largest in the region at 8 254.

Agriculture forms the key economic activity within the greater Pixley Ka Seme District Municipality and according to the Pixley Ka Seme District Growth and Development Strategy the Municipalities of Ubuntu, Siyathemba and Siyacuma contribute the most to this sector, with a total of 28,49% contributed to the provincial Gross Geografic Product. This underlines the key importance of Ubuntu LM with regards to the economic growth of the District.

The northern portion of the Ubuntu Local Municipality is located in the Renewable Energy Hub that was identified by the Northern Cape Spatial Development Framework. The purpose of which is to provide a special economic zone that will support the development of alternative energy sources to stimulate economic growth and development. (Pixley Ka Seme SDF 2014)

6.3.2 DESCRIPTION OF THE STUDY AREA AND LAND USES

The Ubuntu LM is divided up into 4 Wards. The study area is located in Ward 3, the largest ward with an area of 16 891km². As expected, agriculture forms the largest land use in this sector. This will be expanded on in the Socio-economic Specialist Report and in the Agriculture & Social Impact Assessment Report.

6.4 KEY DEMOGRAPHIC INFORMATION

6.4.1 POPULATION SIZE

Census 2011 determined the Pixley Ka Seme population to be 203 788 throughout an area of 103 410km². This puts the population density of the district at 1.9 persons/km². Despite the very low population density the district contributes 16.4% to the total population of the Northern Cape. The district is characterised by low-income households with high levels of unemployment. It has been noted that Pixley Ka Seme DM has been plagued by mismanagement of funds over the past years (Pixley Ka Seme IDP 2022-2027). Despite this the DM is considered to be in a very favourable position, with major river systems and various national routes passing through. These provide a potential source of income into the area via different avenues.

Ubuntu LM is the largest of the eight municipalities that make up the district, accounting for almost a quarter of its geographical area. Of the estimated 58 975 Households in the Pixley Ka Seme DM Ubuntu contributes 5 950. With its population size of 18 601 the LM also contributes only about 9% to the district's population with the majority being found in the three major centres.

6.4.2 Population Growth

The Ubuntu LM population increased from 16 375 in 2001 to 18 601 in 2011, indicating a 1.6% growth per annum and an 11.9% population growth over the 10-year period. The growth rate for this LM is well below the average national population growth of 35.7% from 2001 to 2011. According to the Ubuntu Local Municipality Draft IDP 2022/2023 the growth rate of LM moving forward will depend on the economic opportunities that the municipality has to offer. Young adults have been identified as a priority group due to their propensity to migrate away for better employment opportunities. A local stagnating economy that cannot provide qualified school learners with suitable job opportunities will result in the loss of these economically active adults to areas with better opportunities.

6.4.3 Age and Gender

The age and sex structure of the population is a key determinant of population change and dynamics. The shape of the age distribution is an indication of both current and future needs regarding educational provision for younger children, health care for the whole population and vulnerable groups such as the elderly and children, employment opportunities for those in the economic age groups, and provision of social security services such as pension and assistance to those in need.

The age and sex structure of smaller geographic areas are even more important to understand given the sensitivity of small areas to patterns of population dynamics such as migration and fertility. An increase in the young and the economically active population (EAP) of a LM would thus mean the potential increase in income earnings, however the growth would place pressure on educational resources and job opportunities as there is the possibility for smaller and slower growing economies to provide work to the increasing population.

The Local Municipal sex ratio is an even split of 50/50 Males to Females. (Community Survey 2016: Statistics South Africa) The Community survey also indicated that the Median age of the LM was 25 (as opposed to Pixley Ka Seme which is 26). 24% of the population is between the ages of 10-19 which is about 20% higher than the overall Pixley Ka Seme DM.

When the local statistics of Ubuntu are compared with the age breakdown of the District and Provincial data (Figure 6-1), it is evident that Ubuntu has a slightly larger younger population than the district or provincial areas. As such the population of 18-64 year olds is smaller than that of the greater area.

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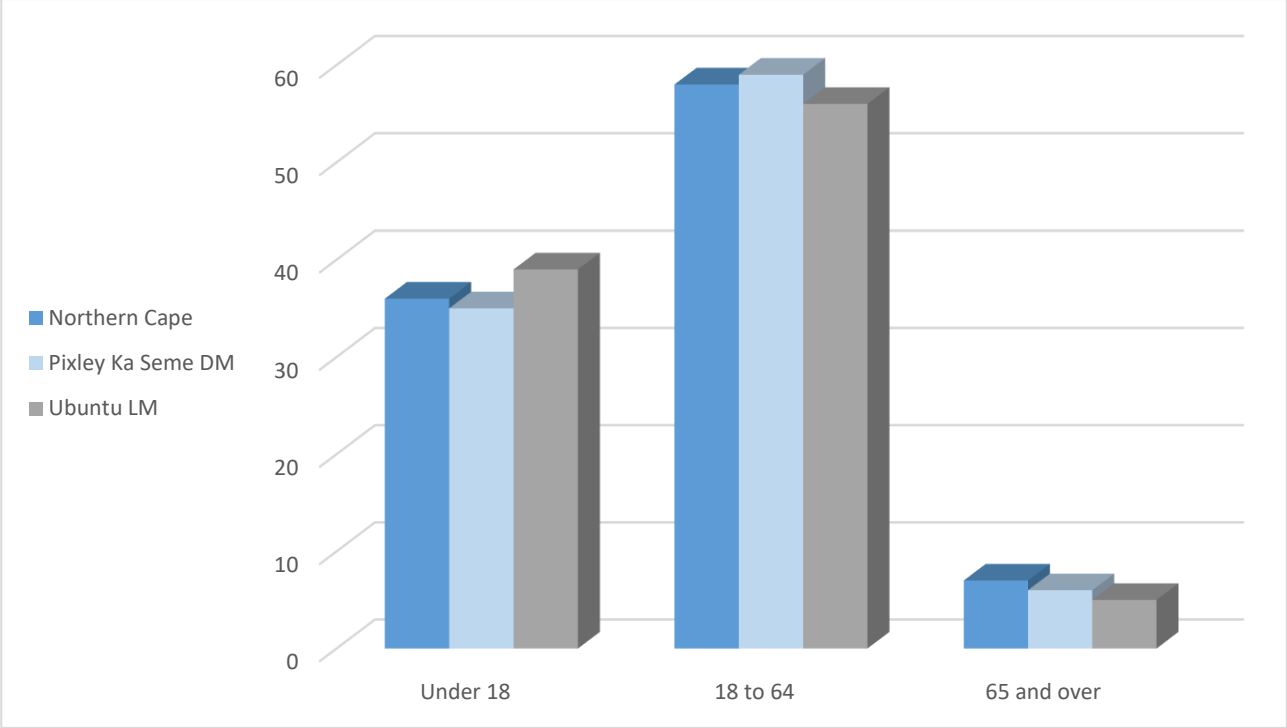

Figure 6-1: Age Range of Provincial, DM and LM.

This again emphasises the importance of education, sport and recreation for youth development in the area if the LM is to experience economic growth in the future.

6.4.4 Race and Language

The largest proportion of the population within the Ubuntu LM are Coloured which represents 73% of the population. This is 1.5 times the population proportion of the Northern Cape. This is followed by Black Africans representing 23% and Whites at 4%. The most popular languages spoken in the Municipality are Afrikaans (83%) isiXhosa (13%), and then English and Sesotho at 1%. (Ubuntu IDP 2022/2023)

6.5 Economic Background

6.5.1 Unemployment Rate and Employment Status

Employment status refers to whether a person is employed, unemployed or not economically active. The official unemployment rate thus gives the number of unemployed as a percentage of the labour force. The labour force in its turn is the part of the 15–64-year population that's ready to work and excludes persons not economically active (scholars, housewives, pensioners, disabled) and discouraged work-seekers. It is worth noting that, in South Africa, high unemployment coincides with low economic growth.

The Northern Cape Province has an overall unemployment level of 32.4 % and youth unemployment level of 42.4%. (Regional Profile Youth Employment Northern Cape 2015). This is considerably higher than the overall official unemployment rate for South Africa which is at 25.5%.

The Pixley Ka Seme DM has an unemployment rate of 28.3% with a youthful unemployment rate (15yrs-34yrs) of 35.4%. The Ubuntu Local Municipality has an overall unemployment rate of 29.1 % as of 2011. This is down from the 34.1% recorded in 2011. While the youthful unemployment rate is at 34.8%, down from 41.5% in 2001. (Ubuntu Municipality IDP 2022/2023)

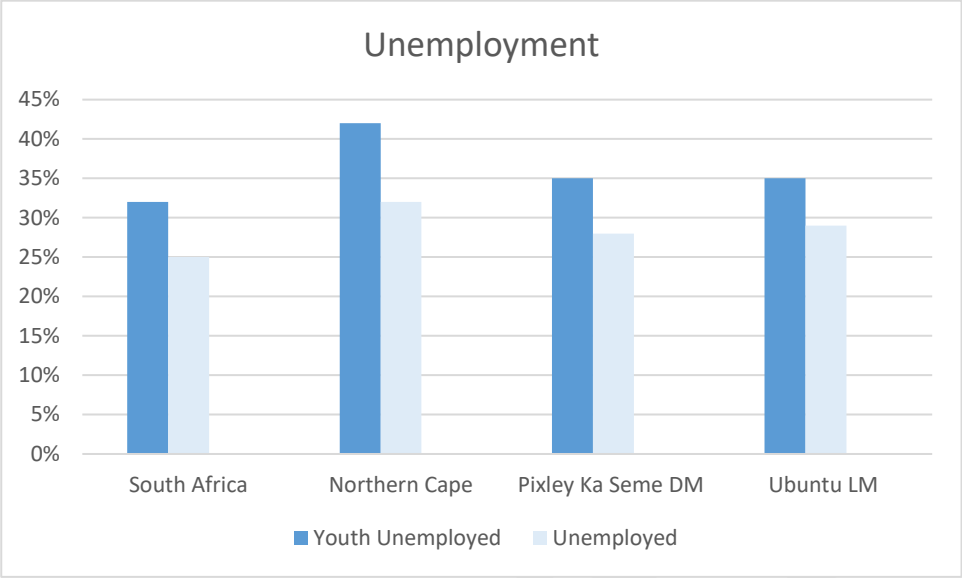

Figure 6-2: Youth Unemployment Percentage of RSA, NC, DM and LM

6.5.2 INCOMES

Annual household incomes for The Northern Cape, Pixley Ka Seme DM and Ubuntu LM are compared in the figure below.

Overall, the income levels of Ubuntu LM are below that of the larger District and Province (Census 2011). According to the 2011 Census as well as the Ubuntu Municipality IDP 9% of the local Municipal population (individual income) earn no income, and 5% earn less than R400 per month. The majority of the local population earn between R833 – R1 666 per month (31%). Only 6% earn more than R12 500 p/m.

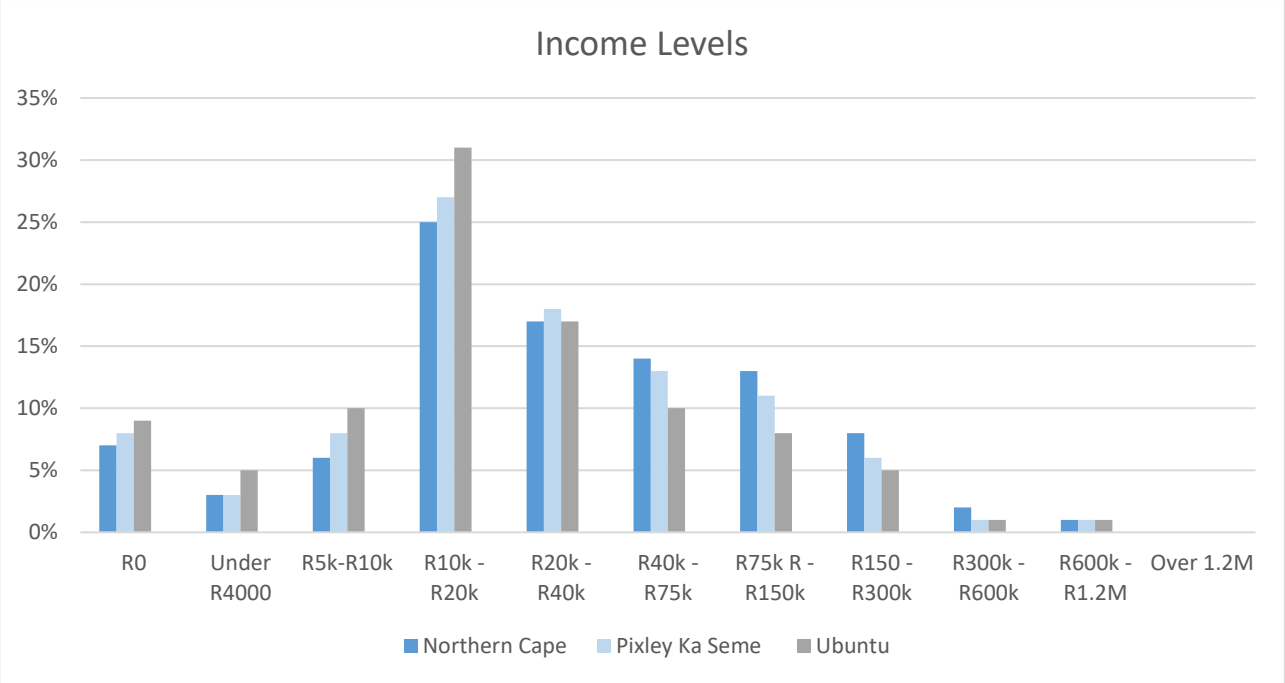

Figure 6-3: Income Level of the Northern Cape, Pixley Ka Seme DM and Ubuntu LM.

6.5.3 Economic Sectors & Employment

The Northern Cape has the smallest population and economy of any of the provinces. With 1.2 million residents, the Northern Cape accounted for only 2% of South Africa's population in 2014/2015, and contributed a similar share of the GDP. As of 2020 the largest sector for employment in the Northern Cape Province was the community and social services sector which accounts for 34.3% of the labour market in the Province. Thereafter, most employment opportunities were offered within the trade sector (14.8%), finance (12.2%) and mining (10%). Utilities accounted for the smallest share of people employed along with transport. (NC Socio Economic Review and Outlook 2021).

Pixley Ka Seme DM's major employers are community and social services (32%), trade (18%), which includes retail and tourism, followed by Agriculture (15%). Electricity/Utilities account for 1% of total employment in the District (NC Socio Economic Review and Outlook 2021).

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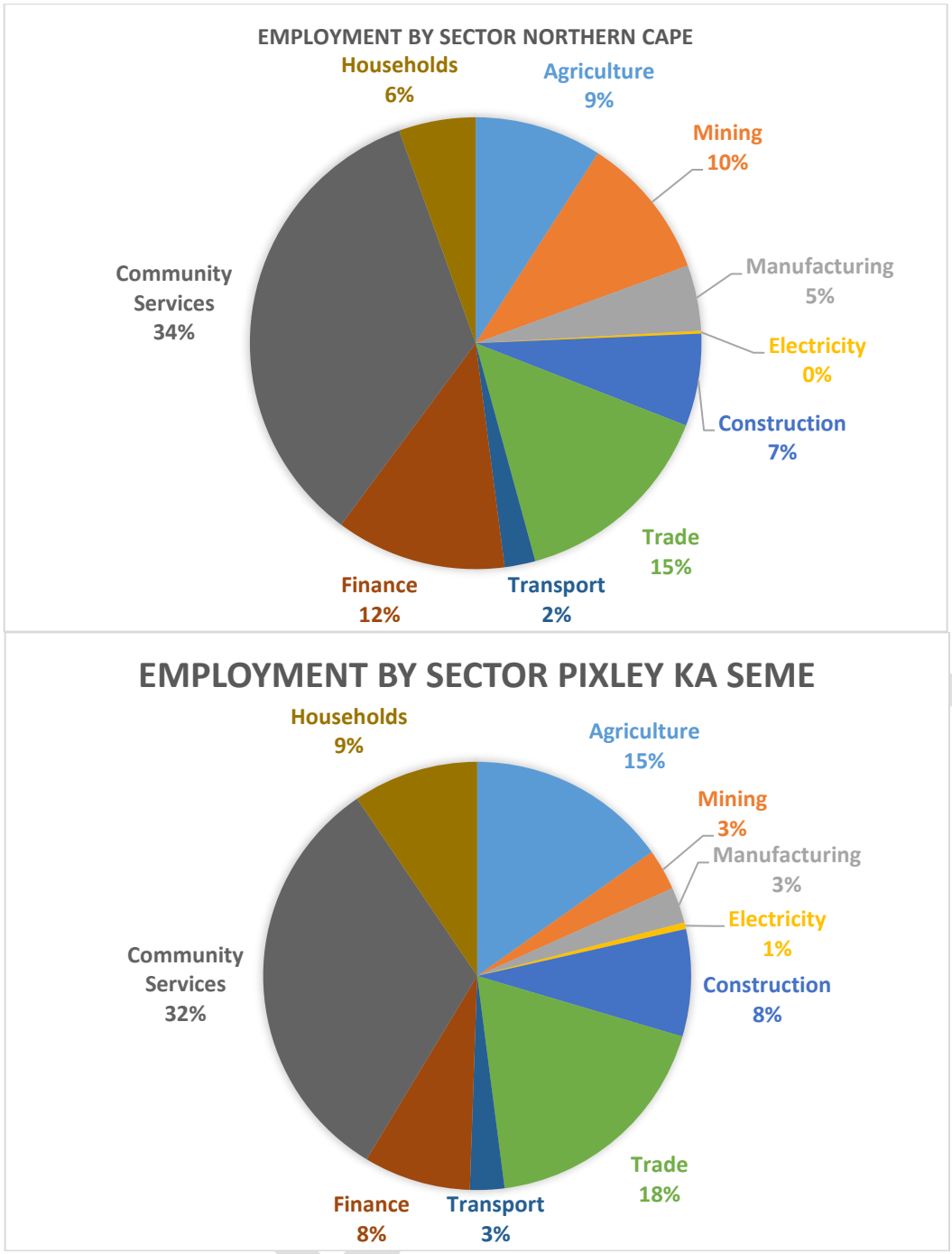

Figure 6-4: Employment Sectors of the Northern Cape and Pixley Ka Seme DM (NC Socio Economic Review and Outlook 2021).

Unlike the Greater Province and District, Ubuntu LM's economic sectors are dominated by trade and Agriculture. Construction, transport and finance are the next largest contributors.

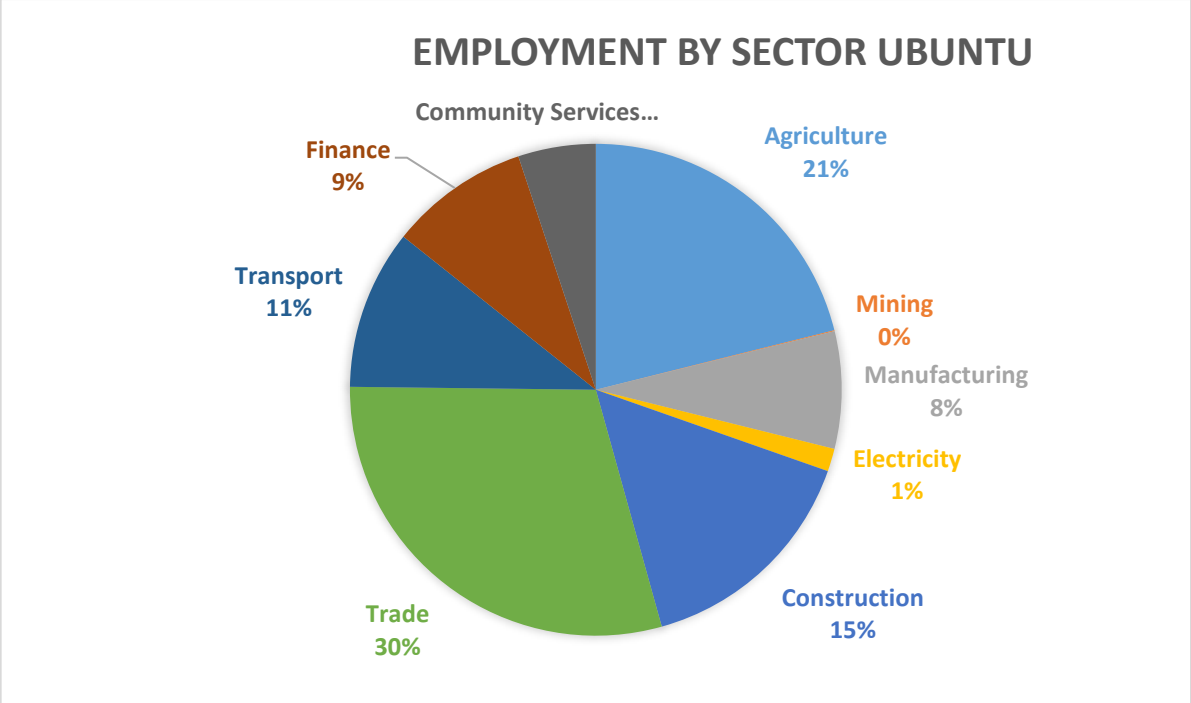

Figure 6-5: Economic Sectors of Ubuntu LM.

6.5.4 Economic Development

As of 2018 the Pixley Ka Seme DM has a GDP of R 12.3 billion which is up from R 6.71 billion in 2008. The DM contributed 12.46% to the Northern Cape Province GDP of R 98.6 billion in 2018 increasing in the share of the Northern Cape from 12.27% in 2008. Overall, the Pixley ka Seme District Municipality contributes 0.25% to the GDP of South Africa which had a total GDP of R 4.87 trillion in 2018 (as measured in nominal or current prices). It is expected that Pixley ka Seme District Municipality will grow at an average annual rate of 0.15% from 2018 to 2023. The average annual growth rate of Northern Cape Province and South Africa is expected to grow at -0.03% and 1.50% respectively. The Pixley Ka Seme District Development Model 2018 identified three main sectors with regards to the main drivers of the economy which are discussed below.

A) Primary Sector

The primary sector consists of two broad economic sectors namely the mining and the agricultural. Between 2008 and 2018, the agriculture sector experienced the highest positive growth with an average growth rate of 14.3%. The mining sector reached its highest point of growth of 8.7% in 2013. The agricultural sector experienced the lowest growth for the period during 2011 at -12.6%, while the mining sector reaching its lowest point of growth in 2009 at -11.8%. Both the agriculture and mining sectors are generally characterised by volatility in growth over the period.

B) Secondary Sector

The secondary sector consists of three broad economic sectors namely the manufacturing, electricity, and the construction sector. In 2010 the manufacturing sector experienced the highest positive growth with a growth rate of 7.6%. The construction sector reached it s highest growth in 2009 at 11.8%. The electricity sector experienced the highest growth in 2018 at 2% while it recorded the lowest growth of -5.7% in 2013.

C) Tertiary Sector

The tertiary sector consists of four broad economic sectors namely the trade, transport, finance and the community services sector. The trade sector experienced the highest positive growth in 2010 with a growth

rate of 4.3% while the transport sector reached its highest point of growth in 2008 at 3.9%. The finance sector experienced the highest growth rate in 2008 when it grew by 5.9%. With regards to the community services sector the highest positive growth was experienced in 2008 with 6.6%.

INDEPENDENT POWER PRODUCTION PROJECTS

The Northern Cape is in a very favourable position with regards to being able to contribute to South Africa's renewable energy development. According to The Green Document as of 2018 the Northern Cape is host to 59 of the country's 112 Independent Power Producers, the most out of all the provinces.

Of the 59 projects in the Northern Cape, Photovoltaic Solar contributes approximately 43% with wind only marginally less at 40%. The remaining 17% is contributed by Concentrated Solar Power. The combined projects are responsible for a total of 3621 MW online (this excludes projects that are in early operations) with 5 592Gwh generated. (IPP Quarterly Report, December 2016). In addition to renewable energy power production and the offset of CO_2 emissions, far-reaching socio-economic advantages manifest. These include procurement, enterprise development, employment creation, local equity and socio-economic development for local communities.

The IPP Quarterly Report for Northern Cape Province states that the committed procurement spent in the Province, during both construction and production, amounts to R 134.1 billion which equates to 66% of the country total. Of this, R44.7 billion (33%) has been realised. Employment remains a top priority in the Northern Cape as with the rest of South Africa. IPP investments within the Province alone have contributed to new employment opportunities for SA citizens estimated at more than 68 000 job years over the construction and operational life of the projects. This is 60% out of the total country when it comes to IPP generated job opportunities and again highlights the strategic position of the Northern Cape with regards to Renewable energy projects.

Socio-economic development (SED) and economic development (ED) expenditure under the IPPPP are focused on education and skills development, social welfare, healthcare, general administration, and enterprise development. An important focus of the IPP is to ensure that the build programme secures sustainable value for the country and enables local communities to benefit directly from the investments attracted into the area. This falls under the Socio-economic development (SED) contributions. These are focussed in five main categories; namely, education and skills development, social welfare, healthcare, general administration, and enterprise development.

6.6 SOCIAL STATUS

6.6.1 EDUCATION

Persons with no schooling are defined as people who never received any form of formal education. This implies illiteracy in most cases and would limit the person to perform manual labour. The importance of education is emphasized, as the education levels of a population is directly linked with that population's level of employability.

There have been positive improvements on district and local level, with the decrease in the percentage of the population that has not received schooling. A high level of dropouts, especially at primary education level, remains.

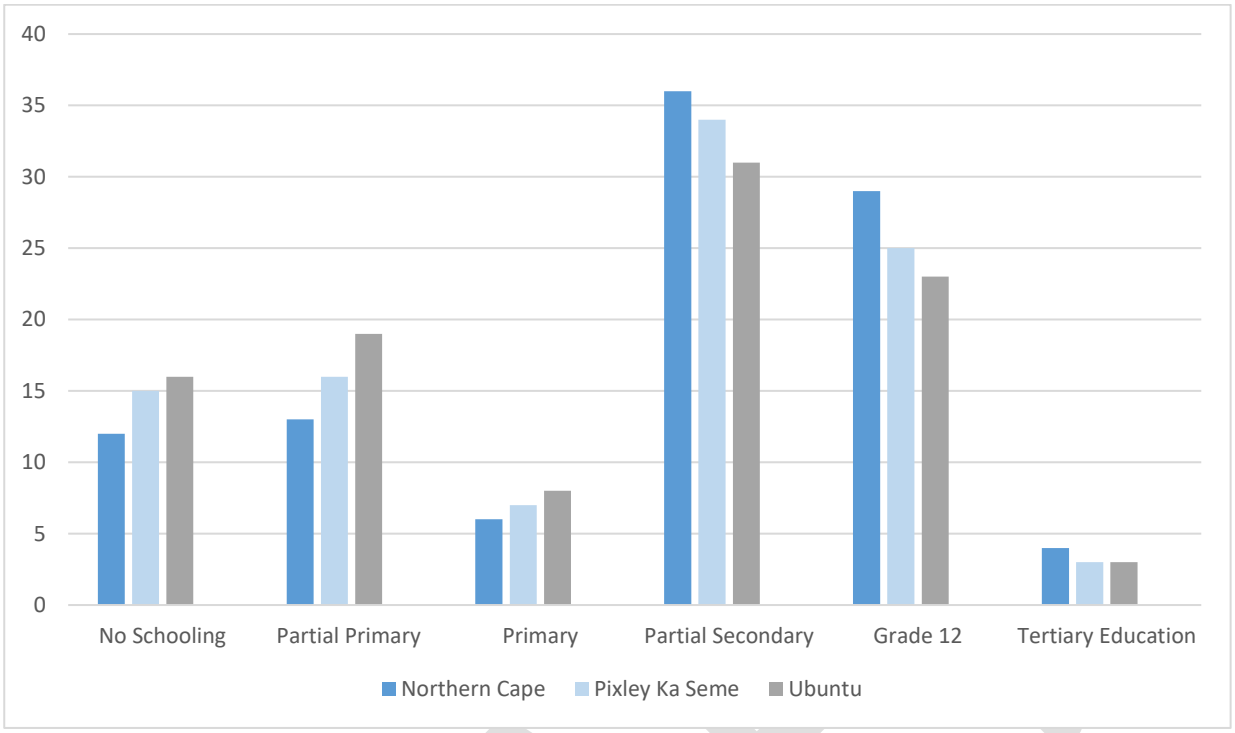

Figure 6-6: Education Levels in the Province, DM and LM

In the Ubuntu LM, Census 2011 statistics show that the level of people with no education decreased from 30.6% to 16.4%. The number of Matriculants has also increased from 12.2% to 18.7%. While this is a positive trend the number of people with no education and people without a Grade 12 certificate remains a concern.

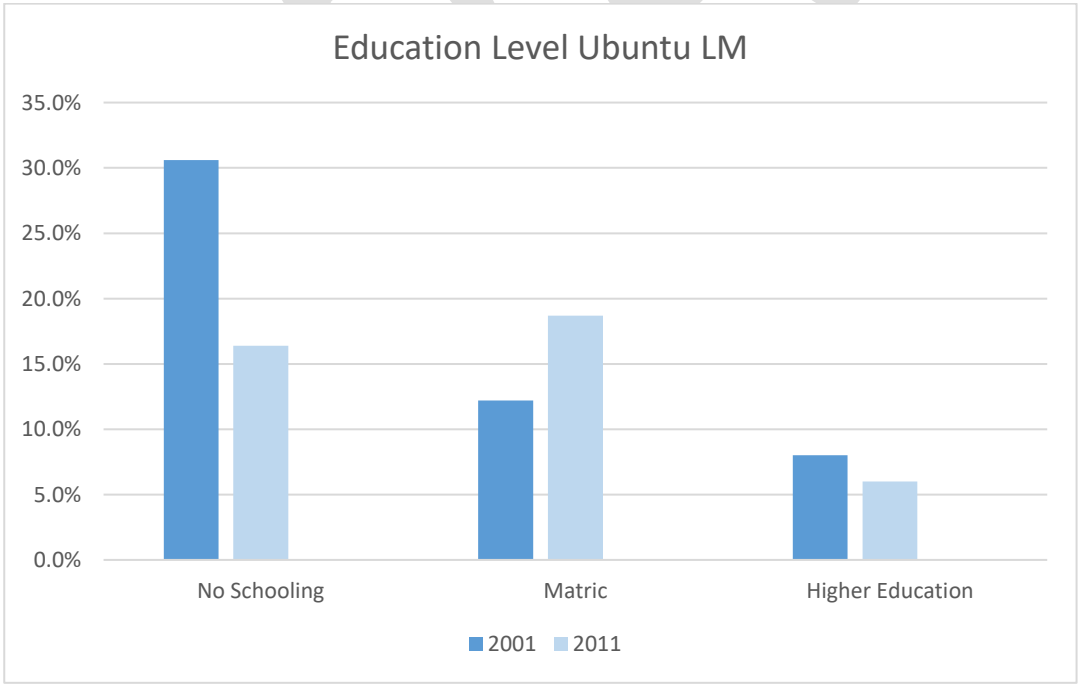

Figure 6-7: Education Levels in the Ubuntu Municipality 2001 and 2011.

Conversely, the number of people completing secondary school and receiving a tertiary education has actually decreased by a small margin.

6.6.2 Dependency, Inequality and Poverty Levels

Poverty is defined not only by levels of unemployment, but also characterized by a lack of access to education, health care, and basic services including water and sanitation.

In the Pixley Ka Seme DM, as of 2019, 35.3% (77 953) of the population were living below the poverty line. (Pixley Ka Seme District Municipality District Development Model 2019) This is 5.9% higher than the 73 650 recorded in 2009.

6.6.3 Crime

Crime in South Africa is known to negatively affect investment and growth which in turn harms employment opportunities. While crime levels in the Pixley Ka Seme DM and the Ubuntu LM are relatively low compared to the rest of the country (Ubuntu LM IDP 2022) the threat of crime is still an ongoing issue within the region. Crime and crime prevention diverts resources to protection efforts and exacts health costs through increased stress and untimely creates an environment not conducive to productive activity. The Pixley Ka Seme DM is not immune to this country wide issue and recent statistics have shown the increased levels of substance abuse, gender based violence and violent crime. (Pixley Ka Seme IDP 2021/2022)

It has also been noted that a decrease in job opportunities can lead to an increase in local criminal activities. Residential Burglaries has shown a steady increase in all the region over the past six (6) years which is of growing concern. Similar patterns are evident towards business burglaries, assault as well as murder. Murder rates have shown a slight decrease in 2020 which could also be due to lockdown restrictions. The declining mining sector in the province has been noted as a cause for the high crime statistics. This again reiterates the need for economic growth and job opportunities to prevent or at least lower the problems faced by communities.

6.7 Housing, Infrastructure and Services

6.7.1 Housing

As of the 2016 Community Survey there are an estimated 6034 Households in the LM which makes up approximately 10% of the entire DM (Pixley Ka Seme DM total households 56 308). Of these 6034 households 5457 (90%) are formal dwellings while 399 (6.6%) are informal dwellings. The percentage of informal dwellings in the LM is below that of both Pixley Ka Seme (9.92%) and the Northern Cape (12.79%).
The 2016 Survey also showed that 68.8% of the total households in the LM are fully owned or currently being paid off.
According to the Ubuntu Municipalities latest Housing plan there is a current housing backlog of 1850. As such the LM has instigated a Municipal Housing issue programme focusing on 4 main areas.

- Rural Housing
- Urban Housing
- Rental Housing
- Capacity Building

Major Challenges pertaining to housing and settlement aspects within the Local Municipality include

- The non-availability of the land to address current housing demand, available land is owned by private owners which are intensively used mainly for agriculture, SAN Parks and state land;

- The availability of Bulk Services. This is one of the key priorities for the proposed housing projects. This will require close co-ordination with the District Municipality to ensure funding for proposed projects. One strategy proposed within the Housing Plan would be to request the District Municipality to provide a full analysis of existing and proposed bulk services.

6.7.2 SERVICES

A) BULK SERVICES / WATER

Access to safe water is a fundamental human need and plays an important role in socio-economic development. South Africa is classified as a "Water Stressed" Country and as such the availability of water for the local population is an ongoing concern. Pixley Ka Seme DM has a total of 28 200 (49.27%) households with piped water inside the dwelling, 25300 (44.25%) inside the property boundary and a total number of 636 (1.11%) households without any formal piped water source. (Pixley Ka Seme IDP 2018)

The Ubuntu Local Municipality is both the 'Water Service Authority' and 'Water Service Provider' and is also responsible to provide all the other local government services such as municipal roads, storm water management, electricity, waste collection and disposal. Of the 5958 formal dwellings in the LM as of 2018 the number with piped water inside the dwellings was 2970 (49.8%), Piped water in the property line 2770 (46.4%) and those with no formal piped water 218 (3.6%).

B) HOUSEHOLD SERVICES

Increase in service delivery and the development/upgrading of bulk infrastructure should have a positive impact on economic growth thereby increasing possibilities to attract new business opportunities. According to the Ubuntu IDP 2018/2019 Electricity is in good supply throughout the Municipal area. However there are still some issues that have been identified.

The identified issues are:

- The need to upgrade the old electricity network in Victoria West, Richmond and Loxton
- Addressing of street lightning and area lightning in all towns
- Electrification of households in Merriman
- Upgrading of electricity network in Loxton
- Load shedding remains a core challenge for development
- Addressing problems with vendors in Eskom distribution areas
- The rapid increase in electricity tariffs
- Electrification of the new developed sites
- Continuous interaction with ESKOM with regards to their areas of supply within the Municipal areas

In terms of electricity supply to formal dwellings in the Ubuntu Municipality the graph below shows the availability in the LM in comparison to the wider DM and Province. While the proportion of In-House prepaid electricity is greater in the LM the percentage of dwellings with no access remains around 7% which is in line with the greater area.

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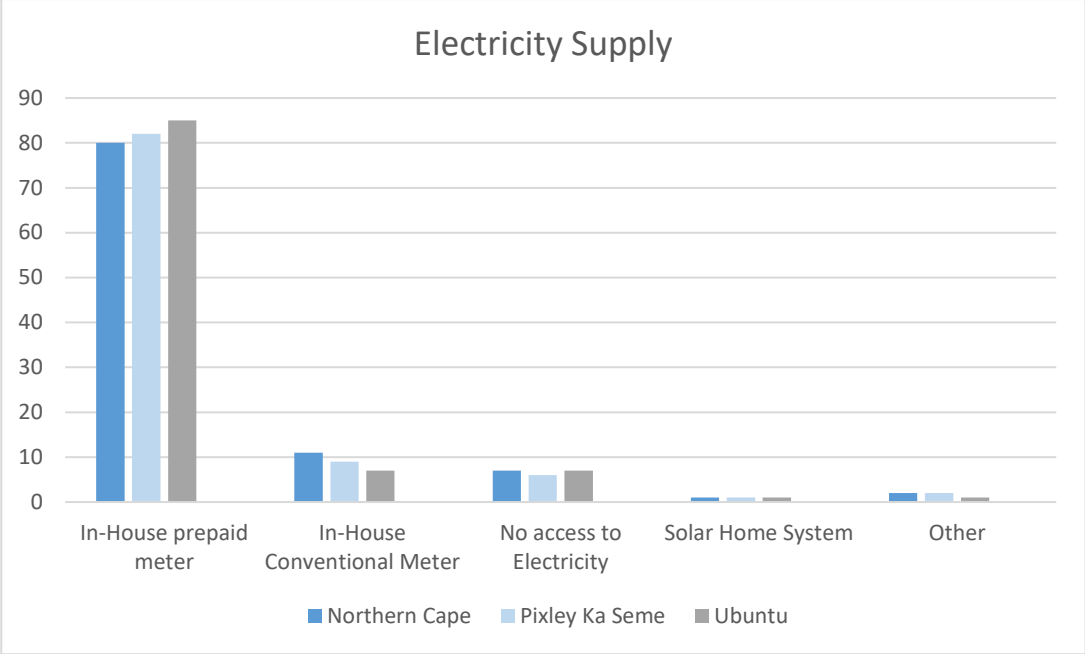

Figure 6-8: Electricity supply with the Province, DM and LM.

In Ubuntu LM, the number of households with flush toilets connected to the sewage network stood at 3303 in 2011. This number has grown to 5250 as of 2018. This is an increase of 37% over the period of 7 years. However there remains over 302 dwellings without any form of sanitation.

In 2016, 83.2% of households had access to a weekly refuse removal service as opposed to 65% experienced in the Northern Cape. However 3% of the households have no formal means of refuse removal.

6.7.3 Landfill Sites

Ubuntu municipality has three unregistered landfill sites that situated are in the main urban centres of Richmond, Loxton and Victoria West. The sites are managed by the Municipality but due to financial and personal constraints the sites have a history of mismanagement. (Integrated Waste Management Plan Ubuntu LM 2017) As part of the ongoing upgrading of services the LM has conducted feasibility studies for the construction of a new landfill site in Victoria West and Loxton along with the intention of upgrading the current existing sites.

6.7.4 Community Safety

The crime rate in the Ubuntu LM is low in comparison to the rest of the country, however there are still issues in the community with regards to safety and security. The Main SAPS office for the region is located within Victoria West. In total there are 3 Police Stations, 2 Magistrates Courts and 2 District courts as can be seen in the table below.

Table 6-1: Safety and Security Facilities.

Town	Police Station	Magistrates Court	District Court
Victoria West	1	1	1
Richmond	1	1	1
Loxton	1	-	-

Total	**3**	**2**	**2**

6.7.5 Health Services

Health services are now provided by the Department of Health. There are 3 Clinics and 2 Hospitals in the Municipality (both with ambulance services). The 2022 Ubuntu IDP has identified the following issues that still need to be addressed with regards to the Health Services in the Municipality.

- Inadequate health facilities within close proximity to the population
- Limited professional medical staff (Doctors & Nurses)
- Limited specialist equipment
- Underutilized facilities
- Shortage of ambulances

Table 6-2: Health Care Facilities.

Town	Clinic	Hospital	Ambulance Service
Victoria West	1	1	Yes
Richmond	1	1	Yes
Loxton	1	-	-
Total	**3**	**2**	**2**

6.7.6 Educational Facilities

There are 12 Primary Schools, 3 High Schools, 7 Pre-schools and no Tertiary Education facilities within the Ubuntu LM. Although the latest census showed that the proportion of citizens with No Education had dropped between 2001 and 2011 the latest IDP has identified the high level of illiteracy as an ongoing issue. This is in part due to the relative lack of education facilities (as well as the lack of teachers). A push to recruit additional teachers as well as to develop additional education facilities has been proposed.

6.7.7 Road Network

In the Pixley Ka Seme DM approximately 72% of the 984km of roads are gravel or unpaved, posing financial and human resources challenges, as gravel roads require a structured maintenance programme. Only 21% are tarred. In the Ubuntu LM approximately 78% of the roads are unpaved and around 20% are tarred. (Pixley Ka Seme IDP 2022-2027)

The project site is located to the South of the R63 between Victoria West in the East and Loxton in the West.

Other important road links in Ubuntu LM are:

- The N12 links Three Sisters in the South to Victoria West in the North.
- The R381 links Beaufort West in the South to Loxton in the Nort.
- A Short portion of the National Route N1 passes through the LM near Three Sisters.

6.8 Land Reform Programmes

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The Land Reform Programme was developed to promote land acquisition, restore land rights lost through dispossession and achieve tenure upgrade. The Ubuntu IDP 2017 states that A Land Usage Plan is a priority issue moving forward and as a priority mor land needs to be identified for use by emerging farmers.

The issues identified in the IDP to be addressed are as follows:
The identified issues are:

- More land for emerging farmers / land reform
- Skills training for emerging farmer and youth
- Upgrading of infrastructure of commonage
- No payment for commonage land by emerging farmers
- Sub-letting of commonage land by emerging farmers to commercial farmers
- Stock theft
- Management of the commonage
- Financial assistance for emerging farmers
- Illegal eviction of farm workers by commercial farmers

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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 EIA 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.

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7.3 ANALYSIS OF ALTERNATIVES

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.

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Table 7-1: Proposed WEF Alternatives.

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 location 1** - Current proposed site (Preferred alternative). This site has been selected based on good wind resource potential, land availability and the sites proximity to available electricity grid.	▲ Suitable wind resource. ▲ Land availability (Soutrivier Central WEF and landowners have formally agreed to the proposed development on the site and are in full support of the use of this area).	▲ Land previously undeveloped. ▲ Potential visual intrusion to surrounding communities. ▲ Potential impacts on avifauna and bats.	**YES**	The main determining factors for selecting the proposed location were:- ▲ Proximity to a grid connection point. ▲ Available land. ▲ Available wind resource. Preliminary investigations have identified that the proposed project site meets the above land specifications.
	Alternative 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 where not deemed to be either reasonable or feasible due to the following: ▲ 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. ▲ Therefore, alternative locations for the proposed Soutrivier Central WEF, were not assessed.

Table 7-1: Proposed WEF Alternatives.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
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	**YES**	The activity does not exclude all current land uses i.e. Wildlife and 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) ▲ Requires a large area of land ▲ Requires more water than wind does ▲ Generates less power per hectare than wind does	**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 Soutrivier Central WEF is not suitable for large scale solar PV, although the low lying flatter areas are. The key motivation for wind is the distance to the grid and to unlock the potential for future solar developments.
	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.	**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.
	Alternative energy technology 4 – Coal fired power plant	▲ None identified	▲ Air pollution from coal dust and smokestack emissions (SO_2).	**NO**	Not environmentally desirable and would not qualify for REIPPPP.

Table 7-1: Proposed WEF Alternatives.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
			▲ Contribution to climate change. ▲ Ground contamination from coal dust.		
	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 Nuclear Power are situated adjacent to the ocean.	**NO**	The significant dependence of nuclear energy generation on high volumes of water preclude its development on the proposed site. Nuclear energy is mutually exclusive to wind energy.
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	**Alternative layout 1:** Preliminary WEF layout, access route, electrical switching stations and short connecting powerline	▲ The preliminary layout consisted of up to 32 turbines.	▲ There may be impacts associated with upgrading and expanding road reserves in sensitive environments.	**YES**	Considering the WEF layout: A maximum of 32 turbine structures will be assessed. The preferred layout will be informed by the feasibility and EIA process and associated specialist assessments. Thus the final proposed WEF layout will be included in the final EIA report as the optimal layout from an environmental perspective, where all

Table 7-1: Proposed WEF Alternatives.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
environmental risks or impacts					environmentally sensitive areas have been designated as NO-GO areas.
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 will be informed by the specialists. The most pertinent specialists who will inform 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 Environmental Management Programme (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 affecting the local flora.	**YES**	Assessed in this report.

8 MANNER IN WHICH THE ENVIRONMENT COULD BE AFFECTED

8.1 INTRODUCTION

CES has developed a revised rating scale for the Scoping Phase in accordance with the requirement outlined in Appendix 2 of the amended EIA Regulations (2014 and amended in April 2017). This scale takes into consideration the following variables:

- Significance
- Consequence
- Extent
- Duration
- Probability
- Reversibility and Mitigation

It is however important to note that impacts are assessed and rated on a broader issue level, and are regarded as preliminary. This is because, at the Scoping Phase, a limited amount of information on project related detail is available. This information requires input from a number of specialist assessments, which are only completed after the Scoping phase thus, a definitive assessment of project specific impacts cannot be completed at the Scoping phase, and our interpretation of the new requirements is that the environmental and social consequences of the project and alternatives needs to be discussed more broadly than what is required in the EIR. This we refer to as an issues level assessment.

8.1.1 ISSUES IDENTIFICATION MATRIX

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 8-1, 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 8-1 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.

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Table 8-1: Ranking of Evaluation Criteria.

Effect	**Duration**	
	Short term	Less than 5 years
	Medium term	Between 5-20 years
	Long term	More than 20 years
	Extent	
	Localized	The proposed site and its immediate environs
	Moderate	District / Municipal and Provincial level
	Extensive	National and International level
	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	
	Unlikely	The likelihood of these impacts occurring is slight (low probability)
	May Occur	The likelihood of these impacts occurring is possible (high probability)
	Definite	The likelihood is that this impact will definitely occur
Reversibility/ Mitigation	**Impact Reversibility / Mitigation**	
	Low	The impact can be easily, effectively and cost effectively mitigated/reversed
	Moderate	The impact can be effectively mitigated/reversed without much difficulty or cost
	High	The impact could be mitigated/reversed but there will be some difficultly in ensuring effectiveness and/or implementation, and significant costs
	Very High	The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly

8.2 IMPACTS MIND MAP

The impacts mind map (Table 8-2) provides at a high-level identification of the category/types of impacts that are expected by the proposed Soutrivier Central WEF, under various themes.

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Table 8-2: Mind map of the impacts identified within the scoping phase of the proposed Soutrivier Central WEF

MIND MAP: IMPACTS - PROPOSED SOUTRIVIER CENTRAL WEF					
THEMES	**CATEGORIES**	**PLANNING & DESIGN PHASE**	**CONSTRUCTION PHASE**	**OPERATIONAL PHASE**	**DECOMMISSIONING PHASE**
Physical Environment	Topography, geology and soils *Turbines, various access and internal roads, and other infrastructure could cause erosion and loss of soils.*		**X**		
	Land use *Turbines, various access and internal roads, and other infrastructure could result in the loss of animal grazing land.*	**X**	**X**	**X**	**X**
	Surface and groundwater resources *Turbines, various access and internal roads, and other infrastructure could impact on sensitive water courses and wetlands.*		**X**	**X**	**X**
Legislative Environment	Environmental, legal and policy compliance *The proposed WEF activity will require various permitting processing prior to construction. The developer will need to approach various state departments for permissions related to rezoning, water use, etc.*	**X**	**X**	**X**	**X**
Biological Environment	Terrestrial ecosystems *The proposed WEF will occur in irreplaceable and optimal CBAAs. Stringent mitigation measures will be required. Turbines, various access and internal roads, and other infrastructure could be located any ecosystems with HIGH threat status.*	**X**	**X**	**X**	**X**
	Avifaunal impacts *Turbines, various access and internal roads, and other infrastructure could result in mortality of important bird species.*	**X**	**X**	**X**	**X**
	Bat impacts *Turbines, various access and internal roads, and other infrastructure could result in mortality of important bat species.*	**X**		**X**	**X**
	Riverine Rabbit impacts *Turbines, various access and internal roads, and other infrastructure could result in the permanent displacement of riverine rabbits.*	**X**	**X**	**X**	**X**
	Economic and Tourism		**X**	**X**	**X**

MIND MAP: IMPACTS - PROPOSED SOUTRIVIER CENTRAL WEF					
THEMES	**CATEGORIES**	**PLANNING & DESIGN PHASE**	**CONSTRUCTION PHASE**	**OPERATIONAL PHASE**	**DECOMMISSIONING PHASE**
Socio-economic Environment	*The proposed WEF could have a negative and positive impacts on local economic development and the tourism industry in the area.*				
	Archaeological, paleontological and cultural sites *Turbines, various access and internal roads, and other infrastructure could result in damage to archaeological and paleontological resources.*		**X**		
	Social benefits from the project *The proposed WEF could have a positive impact on local communities.*		**X**	**X**	**X**
	Social pressures from the project *The proposed WEF could have a negative impact on local communities.*		**X**	**X**	**X**
	Provision of electricity *The proposed WEF would have a positive impact on the provision and stability of energy resources in South Africa.*			**X**	**X**
Cross Cutting Impacts	Noise *The proposed WEF could generate noise that could have a negative impact on human and animal wellbeing.*		**X**	**X**	**X**
	Traffic *The proposed WEF could have an impact on traffic flow and road quality in the area.*		**X**	**X**	**X**
	Visual *The proposed WEF could have a significant negative visual impact on the landscape and on cultural resources and on local economic development and the tourism industry in the area.*		**X**	**X**	**X**

8.3 POSSIBLE ENVIRONMENTAL ISSUES AND IMPACTS

Table 8-3 to 8-6 provides more detailed environmental issues and resulting impacts that have been identified for the following phases of the project development: planning and design, construction and operation. The identification of these impacts has resulted in the recommendation of specialist assessments, which include:

- Avifaunal Monitoring and Impact Assessment;
- Bat Monitoring and Impact Assessment;
- Ecological Impact Assessment;
- Riverine Rabbit Impact Assessment;
- Freshwater Impact Assessment;
- Socio-economic Impact Assessment;
- Archaeological (Heritage) Impact Assessment;
- Paleontological Impact Assessment;
- Noise Impact Assessment; and
- Visual Impact Assessment

These impacts have been identified for the various options proposed, and hence as clarification of these options is gained, some of these impacts may become redundant.

All impacts have been split into "general impacts" and "specialist impacts". For the purposes of the Scoping and EIA process for the proposed WEF the following distinction can be made between the impacts:

- *GENERAL IMPACTS: Impacts which have been identified by the EAP. Examples of key issues identified by the EAP, which will be unpacked as general impacts include:*
  - Climate change;
  - Waste;
  - Site management;
  - Environmental and legal compliance;
  - Construction scheduling; etc.
- *SPECIALIST IMPACTS: Impacts which have been identified by the specialist or impacts which have been identified by the EAP but require input from specialists. Examples of key issues identified as requiring specialist input, which will be unpacked as specialist impacts include:*
  - Socio-economic impacts associated with the development
  - Avifaunal impacts associated with turbine construction and operation;
  - Bat impacts associated with turbine construction and operation;
  - Loss of indigenous flora; etc.

All impacts identified in the following tables will require further investigation either by the EAP or by the identified specialist. It is likely that additional impacts will be added based on the results of the site assessments of the EAP and of each specialist.

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Table 8-3: Issues and impacts identified in the planning and design phase of the proposed development

PLANNING AND DESIGN PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
Traffic & Transport	During the planning and design phase the 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. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: Definitely* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• Further assessment will be undertaken during the EIA Phase and mitigation will be provided in the EIR and the EMPr in an effort to reduce this impact. • A Traffic Management Plan must be compiled by a suitably qualified specialist during the Planning and Design Phase/prior to the commencement of the Construction Phase. • 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 should be done early in the planning phase. The necessary road traffic permits should be obtained for transporting parts, containers, materials and construction equipment to the site.
	During the planning and design the integrity of existing highway infrastructure such as bridges and barriers must be taken into account to ensure that they are not compromised by the heavy vehicle traffic delivering components to the site. *Nature: Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: Unlikely* *Reversibility/Mitigation: Difficult*	**LOW (-)**	
	During planning and design, the inappropriate planning for road construction can increase the risk of surface water run-off, loss of biodiversity, soil erosion, etc. *Nature: Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*	**HIGH (-)**	
	During the planning and design of road modifications, which may be necessary to allow for the delivery of components to site via heavy vehicles, could have long lasting traffic benefits. *Nature: Direct* *Consequence: Beneficial* *Extent: Moderate* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: N/A*	**LOW (+)**	• Further assessment will be undertaken during the EIA Phase and mitigation will be provided in the EIR and the EMPr in an effort to reduce this impact. • The Socio-Economic Specialist will also assess the benefits associated with the road modifications and upgrades.
Storage of hazardous substances	During planning and design the 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	**MODERATE (-)**	• Further assessment will be undertaken during the EIA Phase and mitigation will be provided in the EIR

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PLANNING AND DESIGN PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	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. This impact may also be relevant to the proposed Battery Energy Storage System (BESS) 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 increase the risk of localized flooding, soil erosion, silting, gully formation, etc. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*		and the EMPr to inform suitable methods of hazardous waste storage. • 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 should 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.
Environmental Legal and Policy Compliance	During planning and design, the failure to adhere to existing policies and legal obligations, could lead to the project conflicting with local, provincial and national policies, legislation etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment. *Nature: Direct* *Consequence: Severe* *Extent: Moderate* *Duration: Long Term* *Probability: Unlikely* *Reversibility/Mitigation: Easy*	**HIGH (-)**	• All necessary permitting and authorisations must be obtained prior to the commencement of any construction activities; and • A suitably qualified Environmental Control Officer (ECO) must be appointed prior to the commencement of the Construction Phase.
Stormwater Management and Erosion	During planning and design, the inappropriate design of roads and impermeable areas could increase rates of run-off and therefore the risk of localised flooding. *Nature: Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	• Structures must be located at least 32 m 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
	During planning and design, the inappropriate design of stormwater management could lead to damage, pollution and potential flooding of the site. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term*	**HIGH (-)**	

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PLANNING AND DESIGN PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Probability: May Occur *Reversibility/Mitigation: Easy*		erosion e.g. by considering the applicability of contouring, etc.
Management of general waste	During planning and design, the inappropriate planning for management and disposal of waste e.g. storage disposal could result in surface and ground water contamination. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*	**HIGH (-)**	• Develop and implement a Waste Management Plan for handling on site waste. • Designate an appropriate area where waste can be stored before disposal.
Electromagnetic Interference (EMI)	During planning and design, the failure to account for WEF interference to television, radio and microwave signal may negatively impact on surrounding users. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	• Accurate siting of wind turbines in the planning and design phase has reduced these effects. This includes approval from CELL C, SAWS, TELKOM, SENTECH, MTN and VODACOM. • If complaints are received from surrounding landowners regarding this issue, the developer must investigate and mitigate these issues to the best of their abilities.
Shadow Flicker	During planning and design the failure to take shadow flicker into account may have negative health impacts on surrounding landowners. The movement of the turbine blades across the direction of sunlight causes a phenomenon called shadow flicker, which can result in health problems if people are regularly exposed to it. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	• The appointed Visual Specialist should assess the possible impact of shadow flicker on the individuals residing in proximity to the proposed WEF site.
Changes to Fluvial Geomorphology	During the planning and design, phase the incorrect placement and/or design of bridge pilings or culverts may result in scouring of the river bed in the areas immediately surrounding the pilings or culverts. *Nature: Indirect* *Consequence: Moderate* *Extent: Localised*	**MODERATE (-)**	• The potential impacts associated with the watercourse crossings must be assessed further in the EIR and suitable mitigation must be included in the EMPr.

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PLANNING AND DESIGN PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Duration: Long Term *Probability: May Occur* *Reversibility/Mitigation: Easy*		• The EMPr must include suitable preventative measures to limit erosion and sedimentation of watercourses and the associated banks. • Ensure that scour countermeasures are incorporated into the design of all bridge structures. • Adequate bank stabilization measures must be incorporated into the design of the crossing structure.
	During planning and design, the insufficient planning for erosion prevention along the banks of the streams alongside the water crossing structures will result in erosion that may eventually impair the safety of the structure. *Nature: Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	
Scheduling of Construction	During planning and design, incorrect 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. *Nature: Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	
Loss of indigenous vegetation	During planning and design the inappropriate siting location for the installation of turbine platforms can cause unnecessary clearance of natural vegetation. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*	**MODERATE (-)**	• The Ecological Specialist should assess the proposed locations of the turbine footprints and provide suitable mitigation measures to ensure that the minimum amount of vegetation required is cleared.
Disturbance of indigenous fauna	During planning and design the inappropriate siting location for the installation of turbine platforms can cause unnecessary disturbance to local faunal species, such as the Riverine Rabbit and the Karoo Padloper tortoise. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*	**HIGH (-)**	• The Riverine Rabbit Specialist should assess the proposed locations of the turbines (inclusive of ancillary infrastructure) to provide suitable buffers and mitigation measures for the minimal disturbance to the species.
Disturbance of sensitive areas	During planning and design the inappropriate siting of turbines can result in unnecessary disturbance of sensitive areas and their sensitivity buffers.	**HIGH (-)**	• A suitably qualified ECO should be appointed to monitor the vegetation clearance.

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PLANNING AND DESIGN PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Nature: Direct and Indirect *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*		
Damaging of heritage artefacts due to incorrect placement of turbines	During planning and design the failure to avoid heritage feature / artefacts could results in damage or the permanent loss of these features. *Nature: Direct* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	• The appointed Heritage Specialist must locate existing, and identify potential, sensitive heritage resources and provide suitable buffers to mitigate impacts on these resources during the Construction Phase.
Change in scenery in the WEF area	During planning and design, incorrect placement of turbines in visually sensitive areas may negatively impact individuals' perceptions in terms of sense of place. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: Definite* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	• The Visual Specialist should identify sensitive visual receptors and inform the WEF layout based on the visual sensitivity. This impact will be difficult to mitigate as individuals' perceptions of the Soutrivier Central WEF will vary.
Noise generated by turbines close to sensitive receptors	During planning and design, the incorrect placement of turbines could impact on local people's health. The noise generated by turbines can impact people living within 500m of an individual turbine. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	• The Noise Specialist should identify residences within proximity to the proposed Soutrivier Central WEF site and provide suitable buffers to ensure that individuals residing in proximity to the site are not adversely impacted by the noise associated with the turbines.

Table 8-4: Issues and impacts identified in the construction phase of the proposed development

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
Nuisance dust	During construction, dust generated by certain equipment is likely to be a potential nuisance. *Nature: Direct* *Consequence: Slight*	**LOW (-)**	• The Contractor will be responsible for the continued control of dust

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Extent: Localised *Duration: Short Term* *Probability: Definite* *Reversibility/Mitigation: Easy*		arising from construction activities. • Areas in which topsoil will be stripped for construction purposes must be limited and only stripped when work is about to take place. • The appropriate health and safety equipment (e.g. dust masks) should be worn by workers during the phases of dust-producing construction activity. • Further assessment and mitigation should be provided in the EIR and EMPR.
Construction camp	During construction, campsite sprawl can cause unnecessary disturbance of vegetation and loss of biodiversity. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*	**MODERATE (-)**	• The location, layout and method of establishment of the construction camp must be clearly indicated and demarcated prior to the commencement of construction. • The Ecological Specialist and Riverine Rabbit Specialist should provide suitable mitigation measures based in the floral and faunal sensitivity of the site, including any no-go areas.
Access roads	During construction, the unnecessary disturbance of habitats during road construction could cause loss of biodiversity. *Nature: Indirect* *Consequence: Slight* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*	**MODERATE (-)**	• The Ecological Specialist should provide suitable mitigation measures based in the floral and faunal sensitivity of the site, including any no-go areas.
Fire	During construction, the runaway fires from cooking on the construction camp might lead to the burning of surrounding vegetation. *Nature: Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Short Term*	**VERY HIGH (-)**	• The EIR and the EMPr must include suitable mitigation measures to reduce the likelihood of runaway fires occurring. • The EMPr should include the contact details of the

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Probability: May Occur *Reversibility/Mitigation: Moderate*		relevant emergency services in the area.
Stormwater management	During construction, sediment is likely to be created, 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. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• A Stormwater Management Plan must be implemented throughout the duration of the Construction Phase.
Degradation of drainage lines from earthworks	During construction, unplanned 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. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	• A Stormwater Management Plan and an Erosion Management Plan must be implemented throughout the duration of the Construction Phase.
Soil erosion	During construction, soil could wash out of bare slopes before natural re-vegetation has established. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• An Erosion Management Plan and a Rehabilitation Management Plan must be implemented during the Construction Phase.
Management of general waste	During construction, littering by construction workers could cause surface and ground water pollution. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*	**MODERATE (-)**	• The EIR and accompanying EMPr must provide suitable guidelines for the management of general waste.
Hazardous substances	During construction, the 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,	**MODERATE (-)**	• Further assessment will be undertaken during the EIA Phase and mitigation will be provided in the EIR and the EMPr to inform suitable methods of

DRAFT

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	lubricants and cement during construction activities. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*		hazardous waste storage and management of the BESS.
Management of construction waste	During construction, waste 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. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• Further assessment will be undertaken during the EIA Phase and mitigation will be provided in the EIR and the EMPr to inform the management of construction waste. • The appointed ECO must monitor the management of construction waste during the Construction Phase.
Water Quality	During construction, wet concrete could spill into surrounding watercourse. Wet concrete is highly alkaline. This could result in flash kills of macro-invertebrates and fish species in the vicinity. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• An Erosion Management Plan and Stormwater Management Plan must be implemented during the Construction Phase. • The Contractor must take all reasonable measures to limit erosion and sedimentation due to construction activities and must comply with such detailed measures as may be required by the EMPr. • Disturbed areas should be rehabilitated as soon as possible.
	During construction, soil erosion may occur which will decrease the quality of the aquatic habitat downstream of the construction activities by silting over exposed rocks, decreasing the clarity and oxygen saturation of the water. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	
Hydrology	During construction the use of coffer dams have the potential to permanently change the flow dynamics in a river, exacerbating scour and enhancing sedimentation. Both of these changes can impact negatively on the aquatic ecosystem. *Nature: Direct* *Consequence: Severe* *Extent: Localised* *Duration: Long Term*	**HIGH (-)**	• Water Use Authorisation is required from the Department of Water and Sanitation (DWS) for development within 100 m of any watercourses and within 500 m of any wetlands.

DRAFT

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Probability: May Occur *Reversibility/Mitigation: Difficult*		• The Freshwater Specialist must inform the layout and ensure that sensitive areas are avoided and/or adequately managed and mitigated. • All conditions and mitigations measures provided by the DWS and specified by the Ecological Specialist and the EMPr must be implemented. • A Stormwater Management Plan and Erosion Management Plan must be implemented during the Construction Phase. • The appointed ECO must monitor construction activities near the watercourses and the wetlands.
Riparian Vegetation	During construction the indiscriminate removal of riparian vegetation at the site of the bridge may lead to disturbance of the aquatic ecosystem. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	
Infilling/ Excavation in a Watercourse	During construction activities, excavated material stockpiles may increase sediment loads in watercourses during rainfall events which could affect water quality. *Nature: Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*	**LOW (-)**	
	During construction, 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. *Nature: Direct* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**LOW (-)**	
Disposal of Spoil Material	During construction, the incorrect disposal of subsoil/spoil material could result in significant loss of a useful resource. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*	**MODERATE (-)**	• Subsoil must not 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 should be the last option. • No spoil stockpiles will be allowed to remain onsite once construction activities have ceased.
Management of hazardous chemicals	During construction, soil contamination and a loss of fertile soils as a result of hazardous chemical spills.	**MODERATE (-)**	• Machinery must be properly maintained to keep oil leaks in check.

DRAFT

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Nature: Direct *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*		• If a spill occurs on a permeable surface (e.g. Soil), a spill kit must be used to immediately reduce the potential spread of the spill. • If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent materials. • Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of hazardous chemicals to the environment, and stored in adequate containers until appropriate disposal in a licenced landfill site.
Increased risk of fires from construction activities	During construction site personnel could start fires which could result in the loss of crops, grazing and livestock. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**HIGH (-)**	• Ensure that all personnel are aware of the fire risk and the need to extinguish cigarettes before disposal, in appropriate waste disposal containers. • Smoking must only be allowed in demarcated areas with easy access to fire-fighting equipment. • Welding and other construction activities requiring open flames shall be done in a designated area containing fire-fighting equipment. • The Agriculture & Soils Specialist should assess the potential impact resulting from the loss of crops, grazing and livestock as a result of fires.

DRAFT

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
Soil stockpiling management	During construction, the incorrect stockpiling methods of soil will result in a decrease of agricultural viability/potential of these soils and may even cause sterilization of these soils due to a decrease in viable seed bank. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• Develop and implement a Rehabilitation Management Plan to monitor rehabilitated areas. • Implement measures such as wind-breaks, swales and watering to aid the initial grown of primary vegetation. • Fertile topsoil must not be stockpiled for periods exceeding 12 months or exceeding 2 m in height. • Topsoil may be supplemented with an indigenous seed mix.
Soil profile disturbance and resultant decrease in soil agricultural capability	During construction the excavations for the turbines and associated infrastructure will disturb the soil profile. If topsoil becomes buried, or subsoil and rock that is less suitable for root growth, remains at the surface, the agricultural suitability of the soil, that will become available for agriculture again after decommissioning of the WEF, will be reduced. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**VERY HIGH (-)**	• The upper 15-20 cm of top soil must be stripped and stockpiled as topsoil. It should be retained for re-spreading over disturbed surfaces during rehabilitation. • All other soil excavated will be stockpiled separately from topsoil as subsoil. • Ensure that topsoil does not get buried by subsoil during backfilling. Failure to comply will result in topsoil sterilisation. • The appointed ECO must monitor all excavations to ensure backfilling with subsoil followed by topsoil takes place. • The appointed ECO must monitor depth and cover of topsoil spreading during rehabilitation to ensure a 30cm depth. • Topsoil allocated for rehabilitation must not be mixed with other materials, such as building rubble, rock, subsoil, etc.

DRAFT

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
			• Topsoil stockpiles are to be handled only twice – once during clearing and stockpiling and once during rehabilitation/backfilling.
Loss of vegetation during construction	During construction, loss of natural vegetation due to vegetation clearing and sprawl beyond the development footprint. This could include the loss of plant Species of Conservation Concern (SCC). *Nature: Direct* *Consequence: Severe* *Extent: Moderate* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**HIGH (-)**	• Existing farm tracks or access roads must be used as far as possible during construction. • Construction activities must be demarcated and vegetation clearing and top soil removal limited to these areas. • The layout must be surveyed in peak flowering season, prior to construction and protected plant species transplanted into the neighbouring environment; • Permits to remove species found on the NEM:BA and PNCO list will be required prior to construction. • In the event that a protected tree species needs to be removed, a permit to do so must be obtained from DAFF.
Disturbance to surrounding wildlife and fauna	During construction, vehicular movement, noise and habitat destruction will disturb animals in the area. *Nature: Direct and Indirect* *Consequence: Slight* *Extent: Localised* *Duration: Short Term* *Probability: Definite* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	• Restrict construction activities to post-dawn and pre-dusk where possible. A list of activities permitted to occur outside of working hours is incorporated into the EMPr. These activities may occur once permission has been granted by the landowner. • Construction must be undertaken in the shortest time practical. • Enforce speed limits within the construction
	During construction, the potential loss of specialised faunal habitat due to clearing beyond the development footprint (wetlands, and riparian zones) may reduce faunal populations. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Moderate* *Duration: Long Term* *Probability: May Occur*	**HIGH (-)**	

DRAFT

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Reversibility/Mitigation: Difficult		site (40km per hour is recommended).
Disturbance of sensitive areas	During construction activities erosion and degradation of watercourses and associated riparian habitats may occur due to irresponsible construction of access roads. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*	**HIGH (-)**	• The Ecological Specialist, Avifaunal Specialist, Bat Specialist, Freshwater Specialist and Riverine Rabbit Specialist should inform the layout to ensure that the impact on sensitive watercourses and riparian vegetation is kept to a minimum. • Construction through water courses, only where necessary, must occur within the smallest possible construction footprint, preferably during the dry season, and must be immediately followed by erosion stabilisation and re-vegetation.
Destruction of bird habitat during construction of the facility	During construction avifaunal habitat loss is likely to occur. *Nature: Direct* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	• The Avifaunal Specialist must inform the layout to ensure that sensitive avifaunal areas and their associated buffers are avoided.
Disturbance of birds, particularly whilst breeding	During construction activities the disturbance of birds is likely to occur. This is of particular relevance to those species which are breeding at the time. *Nature: Direct* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	
Destruction of bat roosts due to earthworks and blasting	During construction, the earthworks and especially blasting can damage bat roosts in rock crevices. Intense blasting close to a rock crevice roost can cause mortality to the inhabitants of the roost. *Nature: Direct* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• The Bat Specialist must inform the turbine layout to ensure that sensitive bat areas and their associated buffers are avoided.

DRAFT

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
Artificial lighting	During construction strong artificial lights used at the work environment during night time will attract insects and thereby also bats. However only certain species of bats will readily forage around strong lights, whereas others avoid such lights even if there is insect prey available. This can draw insect prey away from other natural areas and thereby artificially favour certain species, affecting bat diversity in the area. *Nature: Indirect* *Consequence: Slight to Beneficial* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: N/A*	**LOW (-)**	• Utilise lights with wavelengths that attract fewer insects (low thermal/infrared signature), such lights generally have a colour temperature of 5000K (Kelvin) or more. If not required for safety or security purposes, lights should be switched off when not in use.
Loss of foraging habitat	During construction of turbines and access roads some bat foraging habitat will be permanently lost. Temporary foraging habitat loss will occur during construction due to storage areas and movement of heavy vehicles. *Nature: Direct* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: Definite* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	• The Bat Specialist must inform the turbine layout to ensure that sensitive bat areas and their associated buffers are avoided. • Keep to designated areas when storing building materials, resources, turbine components and/or construction vehicles and keep to designated roads with all construction vehicles.
Fossil heritage resources	During construction the disturbance, damage, destruction or sealing-in of fossil remains preserved at or beneath the ground surface within the development area may occur. *Nature: Direct* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**LOW (-)**	• Monitoring of all substantial bedrock excavations for fossil remains by the appointed ECO, with reporting of new paleontological finds to ECPHRA.
Houses and farm walls	During construction damage to built-structures older than 60 years in age may occur. All built structures older than 60 years are protected by SAHRA. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	• All houses and walling within 50 m of the turbine footprints must be demarcated before any construction activities takes place in the area. • No infrastructure may occur within 20 m of walling.

DRAFT

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
Stone Age / Historical Period settlements	During construction late Iron Age and Historical Period settlements and walling may be lost or damaged. These sites are protected by the SAHRA. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	• The final layout must be assessed at a desktop level to determine whether or not onsite monitoring will be necessary during the construction phase. • Access roads must be rerouted away from farm buildings. • All mitigation measures which are recommended by the Heritage Specialist must be implemented.
Influx of jobseekers and the impact of temporary construction workers	During construction there may be an influx of temporary workers and jobseekers which may have a negative impact on the area. These impacts include pressure on essential services and conflict between local people and outsiders. *Nature: Indirect* *Consequence: Severe* *Extent: Moderate* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	• The Socio-Economic Specialist must provide recommendations and mitigation measures to ensure that the municipality and the Developers work together to reduce or alleviate possible negative impacts.
Population changes	During construction there may be an increase in population in the Ubuntu LM. These population impacts refer to the degree to which the construction period could impact on the population size, gender, racial and age compositions of the local municipal areas and would thus be affected by the magnitude of 'outsiders' moving into the area and the length of the period that they remain. *Nature: Indirect* *Consequence: Severe* *Extent: Moderate* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**LOW (-)**	• It is recommended that Sub-Contractors only employ construction workers through a labour desk.
Employment opportunities and employment equity	The construction period of the wind energy facility is labour intensive with positive socio-economic consequences. Although not certain at this stage, approximately 500 employment opportunities would become available over the short-term (24-month construction period). Employment is not constant and will start slow, reach a peak and then slow down again towards the end of the construction period. *Nature: Direct* *Consequence: Beneficial*	**MODERATE (+)**	• The Socio-Economic Specialist must provide recommendations and mitigation measures to enhance the benefits relating to employment opportunities for the local communities. • Suitable semi and skilled employees should be

DRAFT

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Extent: Moderate *Duration: Short Term* *Probability: Definite* *Reversibility/Mitigation: N/A*		identified. Tap into existing skills databases of the affected Municipalities and do a skills audit of the available workforce. • Involve the Local and District Municipalities in the ED's and SED's from the onset of the project through open engagement. • The Municipal structures, Ward Councillors and Ward Committees are responsible to transfer information to their constituencies, create task teams and/or PSC's that would ensure compliance with tender procedures. • Municipal structures should train SMMEs and PDIs and assist them in registering and preparing for tender.
Skills development and capacity building of workers	During construction, skills development and capacity building for workers, whether through training or hands-on experience would be a positive outcome of the construction phase. However, due to the relative short length of the construction phase it is doubtful that comprehensive skills training programmes could be undertaken over the short-term. *Nature: Direct* *Consequence: Slightly Beneficial* *Extent: Moderate* *Duration: Short Term* *Probability: Unlikely* *Reversibility/Mitigation: N/A*	**LOW (+)**	
Skills development of supporting industries / local SMMEs	During construction, supporting industries have may benefit from the influx of people. Supporting industries refer to small business enterprises and services that would be required to fulfil needs or requirements that develop as a result of the construction activities and would thus fall under the 'Enterprise Development' (ED) and 'Socio-economic Development' (SED) component of the project. This could include catering, laundry services, accommodation, suppliers of protective clothing, transport and so forth. *Nature: Indirect* *Consequence: Slightly Beneficial* *Extent: Moderate* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: N/A*	**LOW (+)**	
Local procurement	During the construction period local businesses could benefit through the use of local resources. The DoE prescribes a minimum of 40% local content (labour, material and goods), aiming for 65%. This would have positive impacts on the country's local economy. Aside from the most complex turbine parts (which will be imported and transported from Coega harbour, Port Elizabeth), infrastructure elements and the wind farm components will be sourced in South Africa, and where possible from within the local region. General construction materials and goods could be sourced from Victoria West/Loxton and the wider region. *Nature: Direct and Indirect* *Consequence: Beneficial* *Extent: Moderate*	**MODERATE (+)**	• The Developer should implement local procurement policies that would enhance local and regional economic benefits.

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CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Duration: Short Term *Probability: May Occur* *Reversibility/Mitigation: N/A*		
Impacts on the Local Economy	During the construction period the local economy of Victoria West/Loxton may be positively impacted. The DoE requires a local content between 40 and 65% which would ensure that a significant portion of the project benefits are reserved for the local economy (South Africa). However, it is uncertain what portion of the local content would be reserved for the 'local economy' at this point. However, definite positive impacts for the local economy associated with the construction phase are foreseen and would include: • Employment of locals and an increase in salary earners; • Contracts with SMME's and local service providers (catering, transport, etc.) where possible; • Local procurement of material and goods, where possible; • Positive impacts for the retail market (groceries, goods and services, food suppliers, etc.) for local merchants, shops and informal traders; and • Accommodation of foreigners in local establishments and its associated spin-offs. *Nature: Direct and Indirect* *Consequence: Beneficial* *Extent: Moderate* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: N/A*	**MODERATE (+)**	• The Developer must formulate a local procurement strategy to increase the local content of the project. This must form part of the Socio-economic Impact Assessment.
Disruption in daily living and movement patterns	During construction disruptions in daily living and movement patterns for surrounding communities and road users could manifest in the form of traffic and intrusion impacts resulting in short-term disruptions and safety hazards, particularly during the site preparation phase (construction of access roads on site), laying of foundations and the erection phases. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	• Announce disruptions, road closures and so forth by using the local media, road sign boards and other Municipal structures and collaborate with SANRAL and the various Local Municipalities and Disaster Management entities in the affected towns. • Erect signboards indicating accesses to the construction site.

DRAFT

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
			• The Socio-Economic Specialist should provide additional mitigation measures and recommendations to reduce the significance of disruptions to daily living and movement patterns.
Attitude formation, interest group activity, community mobilisation	No interest group activity or community mobilisation for, or against, the proposed project has been observed. However, the following should be noted: • A lack in communication, unrealistic expectations and other employment issues has the potential to result in labour tensions during the construction phase. • In addition to this, the DoE defines the beneficiary community as those communities located within a 50 km radius of the project. This requirement has the potential to create conflict, as portions of the affected Municipalities would be excluded from receiving socio-economic benefits. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**LOW (-)**	• Involve the Ubuntu LM from the onset of the project through open engagement. Set up a PSC represented by the various role-players and define the "beneficiary community" in clear terms. • Make the contact details of the PSC available to the local communities should they wish to lodge complaints. • The Ubuntu LM to set up appropriate structures (task teams, PSC, etc.) that would deal with the ED and SED components of the project (employment, community projects, etc.) in partnership with the developer. • Municipal structures communicate with the various Municipal / Ward constituencies to ensure transparency and avoid those unrealistic expectations are created. • Emphasis is once again placed on employment of locals, as locals may perceive those outsiders are "stealing" jobs. • The Developer should timeously apply for the relevant zonings and permits.
Impacts on the Ubuntu Local Municipality	During construction of the Soutrivier Central WEF specific impacts on the Ubuntu LM could include: • An increase in responsibilities to do a skills analysis, compile a database of an available local workforce, identify local service providers and provide relevant training; • Issuing of zoning permits timeously; • Representation on the Environmental Monitoring Committee (EMC), representation on a Project Steering Committee (PSC) and any other structures, which requires extra time and capacity; and • Legal responsibilities in terms of actions against land owners, the developer or any other parties that contravene Municipal bylaws. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur*	**MODERATE (-)**	

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CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Reversibility/Mitigation: Difficult		
Accommodation for workers	During construction the local workers will commute from their homes on a daily basis. The only employees overnighting on-site would be limited to approximately eight (8) security personnel. Expatriates and other skilled employees are usually set up in Guesthouses and B&B's and other accommodation facilities in the project vicinity. An opportunity exists for local establishments to profit from this opportunity with a positive impact on the local economy. There are many accommodation establishments in Victoria West and Loxton and the availability is deemed to be sufficient. *Nature: Direct and Indirect* *Consequence: Slightly Beneficial* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: N/A*	**MODERATE (+)**	• Inform the Chamber of Business and local community structures about accommodation requirements in order for accommodation establishments to be prepared for the influx of people to the Victoria West/Loxton area.
Impacts on infrastructure and services	During construction electricity and water may be interrupted. It is not anticipated that any major water and electricity services would be disrupted at this stage, however; electricity might be disrupted for a short period in time should the existing Eskom power lines be rerouted and when the WEF / switching station is connected into the grid. The Municipality would be notified in time should this take place. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Short Term* *Probability: Unlikely* *Reversibility/Mitigation: Difficult*	**LOW (-)**	• This impact is unlikely, but should this impact occur, the Socio-Economic Specialist should provide recommendations to reduce the significance of this impact.
Health and safety risks for workers	During the construction phase the inadequate management of the construction process and general construction related activities could result in health and safety risks for workers. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**LOW (-)**	• Construction workers to wear protective clothing (e.g. masks that minimize dust inhalation and clothing that protects against sunburn). • Lock away dangerous plant, equipment and material when not supervised or in use. • Dispose of the various types of waste generated in the appropriate manner at the closest

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CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
			registered waste fill sites at regular intervals. • Identify the waste types that are likely to be produced and aim to reduce the amount of waste as much as possible, through identifying routes to reuse or recycle materials. Label all waste storage and skips, detailing the type of waste. • Provide safe and clean drinking water and instil regular water breaks to keep workers hydrated. • Provide sufficient chemical /portable toilets at strategic locations that are cleaned regularly. • Keep the local fire, police and ambulance services informed of construction times and progress.
Security impacts	During construction the security of the Soutrivier Central WEF site may be compromised. The perception exists that criminal activities increase in areas where construction projects take place. The appointment of local construction workers often aids to mitigate potential security issues. General security on site should also receive attention as cables and other valuable material could attract criminals with negative economic consequences for the developer. Electric fencing, CCTV cameras, 24-hour security guards, random security checks throughout the site and access control to the site are some of the safety measures that could be implemented to eradicate potential crime on site and in the area. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**LOW (-)**	• The local SAPS and Ward Councillors should be informed about the construction progress and timelines to ensure that they are able to adequately deal with any type of disruptive behaviour which could occur due to the project.
Visual intrusion of construction equipment	During the construction phase the equipment needed to erect the wind turbines may affect the 'sense of place' of local residents. *Nature: Direct and Indirect*	**MODERATE (-)**	• Construction must be limited to normal working hours, between 07:00 and 18:00, to ensure that

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CONSTRUCTION PHASE			
Issue	**Impact**	**Significance (Pre-assessment estimate)**	**Mitigation & Further Assessment**
	Consequence: Moderate *Extent: Localised* *Duration: Short Term* *Probability: Definitely* *Reversibility/Mitigation: Difficult*		construction lighting on-site is limited, where possible. A list of activities permitted to occur outside of working hours must be incorporated into the EMPr during the EIA phase and approved by all relevant specialists.
Noise generated during the construction period	The construction phase could generate noise during different activities such as: • Site preparation and earthworks to gain access using bulldozers, trucks etc. • Foundation construction using mobile equipment, cranes, concrete mixing and pile driving equipment (if needed). • Heavy vehicle use to deliver construction material and the turbines. *Nature: Direct and Indirect* *Consequence: Slight* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**LOW (-)**	• It is likely that the construction noise will have little impact on the surrounding community as construction will most likely occur during the day when the ambient noise is louder and there are unstable atmospheric conditions. The site is also situated in a rural farmland area and no communities are within immediate proximity of the site.

Table 8-5: Issues and impacts identified in the operational phase of the proposed development

OPERATIONAL PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
Air Quality: Climate change	During operations 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. *Nature: Direct* *Consequence: Beneficial* *Extent: Extensive* *Duration: Long Term* *Probability: Definite* *Reversibility/Mitigation: N/A*	**VERY HIGH (+)**	• This beneficial nature of this impact should be enhanced by promoting the use of renewable energy locally.
Lighting	During operations the facility may be lit at night which could have adverse impacts on the landscape character and sense of place due to long-term visibility of land. *Nature: Direct* *Consequence: Moderate*	**HIGH (-)**	• Night lighting impacts could be reduced by using shaded lighting and using lights at low levels. • If complaints are received from the surrounding

OPERATIONAL PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
	Extent: Localised *Duration: Long Term* *Probability: Definite* *Reversibility/Mitigation: Difficult*		landowners, relating to shadow flicker, these must be investigated and mitigated to the best of the Developers' ability.
Architecture of ancillary infrastructure	During operations the control buildings, toilet facilities and other ancillary infrastructure could cause negative visual intrusion if allowed to fall into disrepair and not maintained properly. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Easy*	**MODERATE (-)**	• All project structures and buildings, which are visible to the public, must be maintained to reduce the visual impact.
Hazardous chemical storage	During operations the inappropriate storage of chemical, herbicides, diesel and other hazardous substances on site could result in soil and water contamination and also pose a high accident danger risk. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	• All hazardous substances must be stored in appropriately bunded locations. • The EMPr should recommend suitable mitigation measures to reduce the risk of hazardous contamination to the site and surrounds.
Operating equipment	During the operational phase noise could be generated by transformers from the process of power conversion. The operation of auxiliary equipment needed to cool the transformers, including cooling fans and oil pumps could also generate some noise. This may cause negative health impacts on people living within the vicinity of the WEF. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	• During the Operational Phase of the proposed WEF, lower noise emission levels from inverters and transformers can be achieved by housing them in enclosed structures.
Increased stormwater run-off	During operations the failure to maintain the storm water 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. *Nature: Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Long Term*	**MODERATE (-)**	• The Stormwater Management Plan should be implemented during both the Construction and the Operational Phases of the proposed WEF.

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OPERATIONAL PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
	Probability: May Occur *Reversibility/Mitigation: Moderate*		
Waste management	During operations there could be littering by maintenance workers and security personnel on site which may impact both flora and fauna in the area. *Nature: Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• The Waste Management Plan should be implemented during both the Construction and the Operational Phases of the proposed WEF.
Increase in erosion potential	During operations an increase in hard surfaces (concrete foundations and roads) will increase run-off and potentially lead to soil erosion. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**HIGH (-)**	• Anti-erosion features must be installed where required. • Ensure that all cleared and impacted land is rehabilitated and revegetated.
Establishment of renewable energy infrastructure on agricultural land	During operation of WEFs within the greater Northern Cape area the gradual reduction of available agricultural land may have negative economic impacts on the availability of profitable agricultural land. The main agricultural land use in the area is livestock grazing and it is not deemed mutually exclusive to wind energy developments. *Nature: Direct and Cumulative* *Consequence: Moderate* *Extent: Extensive* *Duration: Long Term* *Probability: Definite* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	• Avoid developing on high potential agricultural land. If unavoidable, ensure that all development footprints are kept to a minimum.
Alien Species	During operation the failure to monitor exposed land may lead to the invasion of alien plant species in disturbed areas which would detrimentally impact the local flora. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Easy-Moderate*	**HIGH (-)**	• An Alien Vegetation Management Plan must be implemented during the Operational Phase. • Alien vegetation should be removed from the site as it is observed.
Disturbance of birds, particularly whilst breeding	During operations the disturbance of birds by the turbines may occur. This is particularly relevant to the first season of operations and to those bird species which are nesting in the area, such as Verreaux Eagles and Martial Eagles. *Nature: Direct* *Consequence: Severe*	**HIGH (-)**	• The Avifaunal Specialist should inform the layout of the proposed WEF and recommend suitable buffers for sensitive areas

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OPERATIONAL PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
	Extent: Localised *Duration: Short Term – Long Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*		to reduce the impacts on bird species.
Displacement of birds from the site and barrier effects	During operations the displacement of birds from the site due to this disturbance is likely. This may negatively impact on the avifaunal species composition of the site until the local avifaunal acclimatises to the change to the landscape. *Nature: Direct* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	
Collision of birds with turbine blades	During operations the collision of birds with turbines may occur resulting in the loss individual birds. This impact may be exasperated by the loss of protected / threatened bird species. *Nature: Direct* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur-Definite* *Reversibility/Mitigation: Difficult*	**HIGH (-)**	
Barotrauma	During operations bat mortalities may occur due to direct blade impact or barotrauma during foraging activities. Mortalities of bats due to wind turbines during foraging and migration can have significant ecological consequences as the bat species at risk are insectivorous and thereby contribute significantly to the control of flying insects at night. On a project specific level, insect numbers in a certain habitat can increase if significant numbers of bats are killed off. But if such an impact is present on multiple projects in close vicinity of each other, insect numbers can increase regionally and possibly cause outbreaks of colonies of certain insect species. *Nature: Direct* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur-Definite* *Reversibility/Mitigation: Difficult*	**HIGH (-)**	• The Bat Specialist should inform the layout of the proposed WEF and recommend suitable buffers for sensitive areas to reduce the impacts on bats.
Job creation	During operations a few permanent employment positions (unskilled, semi- and highly skilled) would emerge. Employment positions could include: • Technicians, electricians, IT specialists, engineers, administrators (highly skilled);	**MODERATE (+)**	• No mitigation is required.

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OPERATIONAL PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
	• Security (semi-skilled); and • Civil works and site maintenance – grass cutting, road maintenance and so forth (lower skilled). *Nature: Direct* *Consequence: Beneficial* *Extent: Localised* *Duration: Long Term* *Probability: Definite* *Reversibility/Mitigation: N/A*		
Skills development and capacity building	During operations there is the potential for training which would have a positive impact on those involved. Two (2) types of training are envisaged: • Training of workers on the plant; and • Training through the SED component of the project. Although limited, skills development and capacity building would result as on-site training is likely. An important outcome of skills development and training is that employees would be in a position to source work on similar plants once their contracts expire. A skilled labour force is more likely to find employment, resulting in economic advantages for the local economy over the long-term. Once community and other income-generating projects have been identified training would take place to enable the community members to perform their duties and maximise the project benefits. The MOU between the developer and affected Municipalities should address skills development and training responsibilities during the operational phase and compliance with the MOU guidelines is essential. *Nature: Direct and Indirect* *Consequence: Slightly Beneficial* *Extent: Localised* *Duration: Short Term-Medium Term* *Probability: Definite* *Reversibility/Mitigation: N/A*	**MODERATE (+)**	• Maximize the number of local permanent and temporary employees (from the Local and District Municipality), where possible.
Impacts on the local economy	During the operational phase it is expected that the local economy would benefit in the following ways: • The families of employees would benefit economically with an increase in incomes and spending power; • A possible increase in municipal rates and taxes, as the land would be rezoned from "Agriculture" to "Special Use for Agriculture and Renewable Energy Infrastructure", resulting in higher levels of rateable income; • Local communities would benefit economically through shareholding and community upliftment and Social Development projects; and	**MODERATE (+)**	

OPERATIONAL PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
	• The establishment of local downstream industries and services that would support the WEF's operations (to a lesser extent). *Nature: Direct and Indirect* *Consequence: Beneficial* *Extent: Localised* *Duration: Short Term-Long Term* *Probability: Definite* *Reversibility/Mitigation: N/A*		
Impacts on the local community due to community projects, ED and SED contributions	During the operational phase as part of social responsibility and local economic development, the developer would, in consultation with the Ubuntu LM: • Establish a community based BBEEE holding company that holds equity in the WEF project. The Trust would identify community-based projects and manage the funds derived through profit sharing to ensure that socio-economic benefits reach the intended beneficiaries (local community). • The developer could in the initial phases of the project, allocate funds towards community-based projects. Beneficiary communities are defined as those within a 50 km radius from the project site, i.e. Victoria West and Loxton. It is recommended that the project proponent embarks on a holistic, strategic approach for the Enterprise Development and (ED) and Socio-economic Development (SED) components of the project to avoid fragmented community projects in the region. *Nature: Direct and Indirect* *Consequence: Beneficial* *Extent: Localised* *Duration: Short Term-Long Term* *Probability: May Occur Definite* *Reversibility/Mitigation: N/A*	**MODERATE (+)**	• Establish a PSC, forum or similar structure consisting of representatives of the local and district Municipalities and their relevant Directorates for Economic Development, with the objective to: ○ The PSC/forum will identify major "renewable energy development nodes" where wind energy projects are taking place and co-ordinate projects in a holistic manner; ○ PSC / forum prioritizes projects identified in the IDP's and LED programmes; and ○ Formulate a strategy to achieve long-term sustainable goals that would include large economic development projects in the major "renewable energy development nodes" that would contribute to the region's economic growth.
Impacts on land / market values of farm portions included in the project	The operational WEF and associated infrastructure would in all likelihood add value to land that is included in the project for the duration of the project, as rental incomes would be secured for a 20 year period, with the possibility to extend. *Nature: Direct and Indirect* *Consequence: Slight-Slightly Beneficial* *Extent: Localised*	**LOW (+)**	• No mitigation required.

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OPERATIONAL PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
	Duration: Long Term *Probability: May Occur* *Reversibility/Mitigation: N/A*		
Potential impact on rental incomes	For the duration of the operational phase (20 years +), the landowners would benefit financially, as long-term lease agreements are concluded. *Nature: Direct* *Consequence: Beneficial* *Extent: Localised* *Duration: Long Term* *Probability: Definite* *Reversibility/Mitigation: N/A*	**MODERATE (+)**	
Electricity supply and the environment	During the operational phase the proposed Soutrivier Central WEF would have a positive impact on a regional and national level: • Wind energy is renewable and sustainable and cannot be depleted, as is the case with fossil fuels; • Wind energy facilities generally require less maintenance with lower operational costs; • Renewable energy has minimal impact on the environment and produces little or no waste products, such as carbon dioxide and other chemical pollutants; and • Renewable energy projects can bring economic benefits for the country, e.g. in the form of new 'green' jobs. *Nature: Direct and Indirect* *Consequence: Beneficial* *Extent: Extensive* *Duration: Long Term* *Probability: Definite* *Reversibility/Mitigation: N/A*	**HIGH (+)**	
The effect of the WEF of the local sense of place	During operations the visibility of the WEF from Victoria West/Loxton, surrounding game farms, surrounding farms and informal settlement influencing the local people's sense of place. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: Definite* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	• No mitigation possible.
Low frequency noise due to turbine rotation	During operations the effects of low frequency noise include sleep disturbance, nausea, vertigo etc. could have negative health impacts. These effects are unlikely to impact upon residents due to the distance between the turbines and the nearest communities. Sources of low frequency noise also include wind and vehicular traffic, which are all sources that also impact on the receptors.	**LOW (-)**	• The Noise Specialist should inform the final layout of the proposed WEF to ensure that no turbines occur within 500 m of any residences.

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OPERATIONAL PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
	Nature: Direct and Indirect *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: Unlikely* *Reversibility/Mitigation: Moderate*		

Table 8-6: Issues and impacts identified in the decommissioning phase of the proposed development

DECOMISSIONING PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
Pollution	During decommissioning of the WEF littering by construction workers could cause surface and ground water pollution. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• Littering must be avoided, and litter bins should be made available at various strategic points on site. • Refuse from the construction (decommissioning) site should be collected on a regular basis and deposited at an appropriate landfill.
	During decommissioning 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. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• No storage of fuels and hazardous materials should be permitted near sensitive water resources. All hazardous substances (e.g. diesel, oil drums, etc.) must be stored in a bunded area. • Vehicles should be serviced regularly to reduce the likelihood of oil spills.
Dust	During decommissioning dust is likely to be a potential nuisance. *Nature: Direct and Indirect* *Consequence: Slight* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**LOW (-)**	• Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.
Traffic & Transport	During decommissioning a high number of heavy vehicle movements will occur. This may have a detrimental effect on sensitive receptors, especially on existing vegetation. *Nature: Direct and Indirect*	**MODERATE (-)**	• Construction vehicles and machinery should make use of existing infrastructure such as roads as far as possible to

DECOMISSIONING PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
	Consequence: Moderate *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*		minimise disturbance on the receiving environment. • There must be no unnecessary vegetation disturbance.
Soil erosion	During decommissioning and after the removal of all wind turbine related structures, the disturbed soils could become exposed, unstable and prone to erosion. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• After the removal of all wind turbine-related structures, the disturbed soils must be re-vegetated to avoid soil erosion. • Remedial measures should be implemented at the first sign of an increase in erosion.
Land-use	Decommissioning will result in the land which was previously unavailable for certain other land-use becoming available for those uses. *Nature: Direct and Indirect* *Consequence: Slightly Beneficial* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: N/A*	**LOW (+)**	• No mitigation required.
Long-term damage due to poor rehabilitation	During the decommissioning phase poor rehabilitation could result in limited re-vegetation and long-term ecological damage. *Nature: Direct* *Consequence: Severe* *Extent: Localised* *Duration: Long Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• A percentage of operational earnings should be set aside for the Decommissioning Phase, which must include costs for landscaping and revegetation of the whole development footprint • The Rehabilitation Management Plan must be implemented and should include the primary objectives of rehabilitation and the latest acceptable methods for implementation.
Disturbance to surrounding wildlife and fauna	During decommissioning, vehicular movement, noise and habitat destruction will disturb animals in the study area. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur*	**MODERATE (-)**	• Restrict decommissioning activities to post-dawn and pre-dusk, where possible. A list of activities permitted to occur outside of working hours must be incorporated into the EMPr. These

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DECOMISSIONING PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
	Reversibility/Mitigation: Difficult		activities may occur once permission has been granted by the landowner. • Decommissioning of the turbines must be undertaken in the shortest time practical • Speed limits must be implemented and enforced. 40km/h is recommended.
	During decommissioning personnel on site may be tempted to poach wildlife which would have a negative impact on the local fauna. *Nature: Direct and Indirect* *Consequence: Severe* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**HIGH (-)**	• Decommission workers must be transported to and from the site daily. • An inspection of the immediate vegetation surrounding the turbine sites for evidence of snares must be undertaken.
Artificial lighting	During decommissioning strong artificial lights used at the work environment during night time will attract insects and thereby also bats. However only certain species of bats will readily forage around strong lights, whereas others avoid such lights even if there is insect prey available. This can draw insect prey away from other natural areas and thereby artificially favour certain species, affecting bat diversity in the area. *Nature: Direct and Indirect* *Consequence: Slight-Slightly Beneficial* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**LOW (-)**	• Utilise lights with wavelengths that attract fewer insects (low thermal/infrared signature), such lights generally have a colour temperature of 5000K (Kelvin) or more. If not required for safety or security purposes, lights should be switched off when not in use.
Loss of foraging habitat	During decommissioning some foraging habitat will be permanently lost. Temporary foraging habitat loss will occur due to storage areas and movement of heavy vehicles. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Moderate*	**MODERATE (-)**	• The Bat Specialist must inform the sensitivity map through the identification of high and moderate sensitive areas which should be avoided. • Keep to designated areas for vegetation removal and keep to designated roads with all construction vehicles.
Job creation	During decommissioning temporary workers would be required to do the dissembling and/or replacement of components and skilled employees (project managers, technicians, etc.) would also be	**MODERATE (+)**	• No mitigation required. • The Socio-Economic Specialist should provide

DECOMISSIONING PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
	required. The number of employment positions is unknown as this is new technology and none of the existing plants have as yet been decommissioned. However, it could be expected that suitable workers will be available as a large number of people would have gained relevant skills over the 20 year operational period of the Soutrivier Central WEF and similar plants in the region. *Nature: Direct* *Consequence: Beneficial* *Extent: Localised* *Duration: Short Term* *Probability: Definite* *Reversibility/Mitigation: N/A*		recommendations to enhance the benefits associated with job creation.
Impacts on living and movement patterns	During decommissioning there may be negative impacts on traffic movement patterns due to the large construction vehicles required to move new and old components to and from the site. Impacts on road safety, impacts on road infrastructure and dust generation would thus be pertinent. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	• No mitigation possible.
Safety and security concerns	The decommissioning phase would increase the influx of people, which could increase the likelihood of safety and security issues. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**LOW (-)**	• The local SAPS and Ward Councillors should be informed of the construction progress and timelines to ensure that they are able to adequately deal with any type of disruptive behaviour which could occur.
Visual intrusion of construction equipment	During decommissioning the visual intrusion of the equipment needed to dismantle the turbines may affect the local residents. *Nature: Direct and Indirect* *Consequence: Moderate* *Extent: Localised* *Duration: Short Term* *Probability: May Occur* *Reversibility/Mitigation: Difficult*	**MODERATE (-)**	• Dismantling must be limited to normal working hours, between 07:00 and 18:00 to ensure that construction lighting on-site is limited, where possible. A list of activities permitted to occur outside of working hours must be incorporated into the EMPr. These activities may occur once permission has been

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DECOMISSIONING PHASE			
Issue	**Impact**	**Significance (Pre-mitigation)**	**Mitigation & Further Assessment**
			granted by the landowner.

8.4 CUMULATIVE IMPACT STATEMENT

8.4.1 CUMULATIVE IMPACT IDENTIFICATION PROCESS

Sadler (1996) defines cumulative impacts as the "the net result of environmental impact from a number of projects and activities". The impact of the proposed WEF may not be significant or be a serious threat to the environment, but a large number of projects in one area, or occurring in the same vegetation type may have significant impacts (DEAT, 2004). The IFC Good Practice Handbook for Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets were used to compile the section below.

The International Finance Corporation Standards (IFC) recognises Cumulative Impact Assessment (CIA) and management as essential in risk management. However, CIA is also "One of the biggest risk management challenges currently facing project developers in emerging markets…". According to the IFC, "cumulative effects (or impacts) are typically the result of incremental changes to the environment caused by multiple human activities and natural processes".

These challenges include: a lack of basic baseline data, uncertainty associated with anticipated developments, limited government capacity, and absence of strategic regional, sectoral, or integrated resource planning schemes. Considerable debate exists as to whether CIA should be incorporated into good practice of Environmental and Social Impact Assessment, or whether it requires a separate stand-alone process. As a minimum, according to the IFC, developers should assess whether their projects could contribute to cumulative impacts or be impacted upon by other projects and as such the IFC recommends that developers conduct a Rapid Cumulative Impact Assessment (RCIA) either as part of the EIA or as a separate study. This RCIA should follow six (6) general steps:

STEP 1 & 2 – Scoping level Issues identification that could have a cumulative impact

According to the IFC the first step in conducting a Cumulative Impact Assessment (CIA) is to identify what are referred to as Valued Environmental and Social Components (VECs) i.e. biophysical or social amenities that may be affected by cumulative impacts associated with a development. This is typically done through interaction with relevant stakeholders. In terms of a wind farm the following main cumulative impacts that are likely to influence decision making are anticipated:

- Visual Impacts
- Impacts on riverine rabbits, birds and bats
- Impacts on the loss of indigenous vegetation and SCCs

According to the Scottish Natural Heritage Council Guidance Notes on assessing the cumulative impact of onshore wind energy developments, the cumulative impact of a wind farm development in regard to visual impacts is a product of the distance between wind farms, the distance over which they are visible, the overall character of the landscape, the siting and design of the wind farms and the way in which the landscape is experienced. These aspects need to be assessed during the Scoping Phase to determine if the cumulative impact would be significant and thus would require a CIA during the EIA phase.

In terms of birds, collision risk, barrier effect, disturbance and displacement effects, and habitat loss would need to be determined cumulatively for the area of influence. For example, an increase in turbine numbers, as a result of multiple wind farms, could force birds to fly through the windfarm increasing collisions risk as the energetic cost of going around multiple wind farms are too high. Species that needs to be included in the assessment are those specifically sensitive to windfarms and protected species in terms of the relevant legislation. Identifying the range of species likely to be present and/or affected should be completed during the Scoping Phase and this list should be signed-off on by the relevant stakeholders prior to the commencement of the CIA.

In terms of the ecological environment, the cumulative impact of the removal of the same types of vegetation for the proposed, may result in the irreplaceable loss of indigenous species and protected or rare SCCs.

In addition, the removal of indigenous vegetation with a limited distribution range, also increases the risk of invasion by alien species to the point where alien vegetation can displace entire sections of indigenous vegetation leading to local extinctions.

The physical extent to which the impacts need to be assessed will depend on past, existing and potential new (application submitted, under construction, etc.) wind farm and other developments surrounding the current proposed development. Within the proposed WEF development area and a 50 km radius around it, the following WEFs are applicable:

- Taaibos North WEF (DFFE Ref: TBA)
- Taaibos South WEF (DFFE Ref: TBA)
- Soutrivier South WEF (DFFE Ref: TBA)
- Soutrivier Central WEF (DFFE Ref: TBA)
- Soutrivier North WEF (DFFE Ref: TBA)
- Mainstream Victoria West Wind and Solar (DFFE Ref: 12/12/20/1788)
- Modderfontein Solar PV Facility (DFFE Ref: 14/12/16/3/3/1/917)
- Noblesfontein Wind Energy Facility (DFFE Ref: 12/12/20/1993/2) (operational)
- Ishwati Emoyeni Wind Energy Facility (DFFE Ref: 14/12/16/3/3/2/411)
- Brakpoort PV Solar PV Facility (DFFE Ref: 14/12/16/3/3/2/331)
- Nuweveld North Wind Energy Facility (DFFE Ref: 14/12/16/3/3/2/2042)
- Nuweveld West Wind Energy Facility (DFFE Ref: 14/12/16/3/3/2/2043)
- Nuweveld East Wind Energy Facility (DFFE Ref: 14/12/16/3/3/2/2044)

In such areas, where multiple facilities will be constructed, it is important to consider the overall or cumulative impact of these facilities on various aspects such as birds and bats. Consideration of each project in isolation may not adequately judge the effect that the combined capacity of these developments will have on the abovementioned aspects.

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STEP 3 – Baseline Determination

The next step in the CIA process would be to obtain baseline information from the entire affected area, which can be completed in one of two ways:

- Information sharing, i.e. specialist reports pertaining to the wind farms within the affected area can be used as a baseline and the relevant specialists will then be required to review this information and ensure that the gaps are filled within his/her specialist report to ensure that the study covers the affected area in order to complete the CIA
- Baseline information can be obtained and analysed for the affected area.

It is imperative that baseline information does not only consist of recent data collection but also include any historical data available for the area in order to identify the trends or changes over time in order to ensure that recent data is not representative of an already shifted baseline.

STEP 4 – Assessment of the contribution of the development under evaluation to the predicted cumulative impacts

The next step would be to use the baseline data obtained for the area of influence to assess the impact of the development on the relevant environmental / social variables. The methods used for the assessment would be dependent on the variable being assessed. For example, for visual impacts, maps and photomontages can be used to determine what the visual impact from a number of wind farm will be on sensitive receptors, whereas in the case of birds information required would relate to migration corridors, population viability, nesting sites, etc. For a VIA perspective, the relevant specialist would need to look at combined visibility, i.e. are a number of developments visible from a single viewpoint as well as sequential effects, i.e. does the observer have to move to another viewpoint in order to see other developments in the area (SNHC Guidance Notes).

STEP 5 – Evaluation of the significance of predicted cumulative impacts to the viability or sustainability of the affected environmental components

Step 5 entails setting thresholds for the variables to be assessed. This could for example relate to the maximum amount of turbines in a landscape before visual impacts become unacceptable. If setting specific thresholds or targets for environmental variable are not possible then another option would be to identify the limits of acceptable change. This needs to be done in conjunction with the various stakeholders so that agreement can be reached in regards to these limits. The concept of thresholds of acceptable change would then be used to assess the significance of the cumulative impact by considering the level of change associated with all developments within the applicable geographical scope relative to the limit of acceptable change. It is important to bear in mind that the cumulative impact of two similar developments may be less or greater than the sum of the impacts of the individual developments.

Impacts with regards to the visual impact of the area will vary in degree based on the sensitivity of the visual receptors, the landscape context, residents and/or visitors to the area, the magnitude of change in terms of scale, nature, duration, and frequency of combined and sequential views (SNHC Guidance Notes).

Impacts in regards to birds / riverine rabbits / bats should be assessed based on species population size, population trends and range. The spatial scale would be dependent on the conservation objectives, i.e. maintain conservation of a national scale or on a local scale.

Cumulative impacts can be desirable and undesirable. Desirable cumulative impacts of development can, for example, lower rates of unemployment and accessibility to clean energy.

STEP 6 – Design and implementation of mitigation measures to manage the development's contribution to the cumulative impacts and risks

The final step would include the management and mitigation of potential impacts. This may include negotiations with other project proponents to reduce the overall mitigation required by a single project, additional mitigation measures to further reduce impacts identified in the EIA, project design changes, etc.

8.4.2 Cumulative Impacts for Consideration

A preliminary identification of cumulative impacts has been conducted in the Scoping Phase for the proposed WEF (initial ratings in Section 8.3 above) and will be assessed further in the EIA Phase. All Specialist Impact Assessments will include a cumulative impact statement. Specialists will define all identified cumulative impacts and provide an assessment of these impacts. Each identified impact will be rated using the significance rating methodology.

The likelihood of cumulative impacts of the proposed WEF is deemed relatively moderate to high due to the number of proposed developments within the general area.

8.5 Gaps in Knowledge

Due to the complex and dynamic nature of the environment, uncertainty and gaps in our knowledge are inevitable. The Precautionary Principle has been adopted to account for this uncertainty throughout the Scoping Phase of the proposed WEF and will similarly be implemented in the EIA Phase.

The Precautionary Principle ensures that:

- Uncertainty surrounding impacts are identified and addressed appropriately;
- Preventative measures are taken into account throughout the project;
- Various alternatives are thoroughly explored;
- Adequate and transparent public participation is conducted;
- A holistic approach is adopted to ensure social, economic and ecological impacts are explored, and mitigation measures are determined, through an integrated and balanced approach; and
- An adaptive approach is adopted to account for the complexities and dynamism inherent in environmental processes.

The Precautionary Principle ensures that potential impacts are predicted, avoided and mitigated to avoid threats of a serious or irreversible nature (IUCN, 2007).

9 PLAN OF STUDY: ENVIRONMENTAL IMPACT ASSESSMENT PHASE

This Chapter sets out the Plan of Study (PoS) for the EIA phase of the assessment. Consultation with DFFE will be on going throughout this EIA process. However, it is anticipated that DFFE will provide relevant comment with respect to the adequacy of this Plan of Study for the EIA, as it informs the scope and scale of the EIR.

9.1 SPECIFIC CHALLENGES TO THE EIA PHASE

The specific challenges and impacts relevant to the proposed WEF, as a development within the Ubuntu area, are the following:

- Impacts on the topography, geology and soils;
- Impacts on the current land uses;
- Removal of top soil and soil erosion;
- Impacts on terrestrial ecosystems;
- Impacts on aquatic ecosystems;
- Impacts on health and safety;
- Impacts on archaeological, paleontological and cultural sites;
- Impacts on the flow of traffic;
- Noise emissions;
- Visual Impacts; and
- Impacts on the socio-economic environment of the region.

9.2 SCOPE AND INTENT OF THE EIA PHASE

The following aspects in Section 9.1 above will be assessed as part of the EIA process, although it is assumed that additional impacts will be raised by I&APs, the EAP and/or the specialist consultants, and these will also be assessed.

The EIA phase has four key elements, namely:

Specialist Studies: Specialist studies identified as being necessary during the Scoping Phase, plus any additional studies that may be required by the authorities, will be undertaken during the initial phase of the EIA. Appropriately qualified and experienced specialists will be appointed to undertake the various assessments. Specialists will gather baseline information relevant to the study being undertaken and will assess impacts associated with the development. Specialists will also make recommendations to mitigate negative impacts and enhance benefits. The resulting information will be synthesised into the Environmental Impact Report (EIR), whilst the full specialist reports will be attached to the EIR as a Specialist Volume.

Environmental Impact Report (EIR): The main purpose of this report is to gather and synthesise environmental information and evaluate the overall environmental impacts associated with the development, to consider mitigation measures and alternative options, and make recommendations in choosing the best development alternative. The EIR also identifies mitigation measures and management recommendations to minimise negative impacts and enhance benefits. The EIR and associated specialist reports are made available for public and authority review and comment. The availability of the report will be advertised in one Provincial and one local newspaper and the report will also be made available for public scrutiny in easily accessible locations.

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Environmental Management Programme (EMPr): The EMPr provides guidelines to the project proponent and the technical team on how best to implement the mitigation measures and management recommendations outlined in the EIR during the construction and operational phase.

Public Participation Process (PPP) commenced during the Scoping Phase will be continued, during which I&APs are afforded further opportunities to raise their issues, concerns and comments regarding the proposed project. It is possible that some of the project details may have changed in response to the preliminary findings of the Scoping Report, and as a result of design changes made by the project proponent. I&APs and key stakeholders are given the opportunity to review the Draft EIR before it is submitted to the authorities for consideration. Comments on the Draft EIR received from I&APs are included and addressed in the submitted EIR in the form of an Issues & Response Trail.

9.2.1 Impacts Assessment Methodology

CES has developed a revised rating scale for the Scoping Phase in accordance with the requirement outlined in Appendix 2 of the amended EIA Regulations (2014 and subsequent 2017 amendments). This scale takes into consideration the following variables:

- Significance
- Consequence
- Extent
- Duration
- Probability
- Reversibility and Mitigation

Issues Identification Matrix

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 8-1, 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 10-1 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.

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This impacts methodology will be in the assessment of all general impacts (those impacts identified and assessed by the EAP) and in the use of all specialist impacts (those impacts identified and assessed by the various specialists)

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
	Extent	
	Localized	The proposed site and its immediate environs
	Moderate	District / Municipal and Provincial level
	Extensive	National and International level
	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	
	Unlikely	The likelihood of these impacts occurring is slight (low probability)
	May Occur	The likelihood of these impacts occurring is possible (high probability)
	Definite	The likelihood is that this impact will definitely occur
Reversibility/ Mitigation	**Impact Reversibility / Mitigation**	
	Low	The impact can be easily, effectively and cost effectively mitigated/reversed
	Moderate	The impact can be effectively mitigated/reversed without much difficulty or cost
	High	The impact could be mitigated/reversed but there will be some difficultly in ensuring effectiveness and/or implementation, and significant costs
	Very High	The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly

9.3 SPECIALIST STUDIES

Based on the outcome of the current scoping report, it is proposed that the following specialist studies must be conducted as part of the EIA phase:

- **Avifaunal Monitoring and Impact Assessment**
- **Bat Monitoring and Impact Assessment**
- **Ecological Impact Assessment**
- **Riverine Rabbit Impact Assessment**
- **Freshwater Impact Assessment**
- **Archaeological Impact Assessment**
- **Paleontological Impact Assessment**
- **Noise Impact Assessment**
- **Socio-economic Impact Assessment**

- **Visual Impact Assessment**

The ToR for the above-mentioned assessments, which outline the information required from the specialists during the EIA Phase, are provided below as well as the methodology for assessing the significance of impacts and alternatives. Specialists will also be required to address issues raised by I&APs in their reports. The specialists have undertaken high level assessments of the site, and as such, key risks have been highlighted within their ToRs outlines below.

The scope of the specialist studies will be informed by the following gazetted protocols in terms of the DFFE Screening Tool.

9.3.1 Avifaunal Monitoring and Impact Assessment

SPECIALIST: Anja Albertyn, Holland & Associates Environmental Consultants

The proposed development will be assessed in line with the applicable protocols and Best Practice Guidelines (including the updated 2021 Verreauxs' Eagle Guidelines). An Avifaunal Specialist Assessment will be undertaken, based on the outcome of the reconnaissance study and the findings of the preapplication avifaunal monitoring. The assessment, as a minimum, will include the following aspects.

- A discussion on bird abundance and movement within the site;
- A discussion on presence of target or threatened species and their occurrence on the site at heights which could pose risks to collision;
- An assessment of risk of identified target species to collision including the expected fatality rates of the target species based on a suitable model commonly used for risk determination, per species and for the site
- An identification and mapping where relevant, of any migratory or preferential bird routes or corridors;
- A discussion on the risk of displacement;
- Areas identified within the site as having a very high sensitivity for bird collision or displacement and in which the development of turbines should be avoided. These areas will be mapped;
- A cumulative impact assessment will be undertaken which includes:
    - available fatality rates for target species at the wind energy generation facilities within a 30 km radius;
    - the possible additional fatalities from the proposed wind energy generation facility for target species as well as general avifaunal species; and
    - a discussion on the possible cumulative impact of the proposed facility on regional populations of target species;
    - if no existing operating wind energy generation facilities occur within the 30 km radius a discussion on possible cumulative impacts on target species from the proposed facility will be included.
- A plan for post construction monitoring (on both the preferred site as well as the control site) and reporting, which will include:
    - timeframes and intervals for monitoring;
    - number of turbines to be monitored, including any specific area for monitoring;
    - methodology for searcher efficiency and scavenger removal;
    - method for monitoring, i.e. transects or radial as well as extent of monitoring area;
    - results of monitoring compared against expected fatality rates per target species as well as general species;
    - reporting requirements, including organisations for submission of reports;
    - years and intervals for monitoring to occur; and

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- all methods used to estimate bird numbers and movements during reconnaissance and pre-application monitoring, which should be applied in exactly the same order to ensure the comparability of these two data sets.

The findings of the Avifaunal Specialist Assessment will be written up in an Avifaunal Specialist Assessment Report that contains as a minimum the following information:

- the SACNASP registration number of the avifauna) specialist preparing the assessment and their curriculum vitae;
- a signed statement of independence by the specialist;
- a description of the study area including a map of all the aspects identified in the duration, dates and seasons of the site investigation and the relevance of the season to the outcome of the assessment;
- the outcome of the reconnaissance study and the resultant site-specific pre-application avifauna! monitoring;
- a description of the methodology used to undertake the site specific pre-application avifaunal monitoring program inclusive of the equipment used;
- a map showing the Global Positioning System (GPS) coordinates for each of the monitoring points for both the preferred site as well as the control site;
- the monitoring intervals for both sites;
- where relevant, a map showing the areas to be avoided;
- fatality prediction for target species and general species on the preferred site;
- a map showing the existing renewable energy facilities within a minimum 10km radius of the proposed development;
- where relevant, the outcomes of the cumulative impact assessment;
- a discussion based on the pre-application monitoring of the expected impact of the proposed development on avifauna! species;
- a substantiated statement from the avifauna specialist, indicating the acceptability or not of the proposed development and a recommendation on the approval, or not, of the proposed development;
- any conditions to which this statement is subjected;
- a detailed post construction monitoring programme;
- the outcomes of the post -construction monitoring, including data and specialists reports, must be uploaded onto the national bird monitoring database, to be accessed at https://www.environment.gov.za/birddatabase, once operational;
- where required, proposed mitigation measures or any monitoring requirements for inclusion in the Environmental Management Programme (EMPr); and
- a description of the assumptions made and any uncertainties or gaps in knowledge or data.

The impact assessment will assess the following impacts using an impact methodology provided by the Environmental Assessment Practitioner.

- Displacement through habitat loss;
- Displacement through disturbance;
- Mortality from collisions with turbines;
- Mortality from collisions with powerlines; and
- Mortality from electrocutions on electrical infrastructure.

9.3.2 BAT IMPACT ASSESSMENT

SPECIALIST: Jonathan Aronson, Camissa Sustainability Consulting

The Project Area of Influence (PAOI) was defined as the AoI plus a 10 km buffer given that bats are volant mammals (Scottish Natural Heritage 2019). This area has been studied at a desktop level to determine which bat species (i.e., impact receptors) are likely to occur at the project, to provide information on their natural

history and conservation status, and to contextualise the project site within the larger social-ecological environment with respect to bats. Bats have also been studied through field surveys in the AoIs of all proposed WEFs in the development cluster. The field data from this larger area, as well as the desktop information from the PAOI, will be used to assess impacts for each WEF individually.

During the field surveys, bat activity was sampled at 12 locations with Wildlife Acoustics, Inc. SM4 bat detectors. At eight locations, SMM-U2 microphones were positioned at the top of a 10 m aluminium mast. At two locations (T2 and S2), microphones were positioned on a meteorological tower at 60 m and 140 m respectively. At two locations (T6 and S6) a shorter meteorological tower at which microphones were positioned at 60 m was used as well. Sampling took place nightly from sunset to sunrise.

The sampling period included winter, spring, summer, and autumn. The monitoring period therefore spans the full annual cycle and as such provides a representative sample of annual bat activity patterns and how this changes seasonally.

Roost surveys entailed discussions with landowners to locate any known roosts or potential roosts with evidence of bats. In addition, buildings at farmsteads within the AoIs, as well as a ridgeline with rocky outcrops/crevices, were systematically surveyed during field visits in July 2021 (winter), October 2021 (spring) and January 2022 (summer). The surveys aimed to directly observe roosting bats, locate evidence of roosting bats (e.g., culled insect remains, fur-oilstained exit and entry points, guano/droppings), and assess the likelihood for each potential roost to support bats.

Acoustic data retrieved from each bat detector were processed using Kaleidoscope® Pro (Version 5.4.2, Wildlife Acoustics, Inc.). Bats were automatically identified using the embedded "Bats of South Africa Version 5.4.0" reference library and verified by inspecting echolocation files. The number of acoustic files recorded was used as a measure to quantify bat activity.

The Bat Impact Assessment Report, which will be prepared as part of the EIA phase will conduct the following:

- Consolidation and analysis of the screening phase and pre-construction bat monitoring data collected on site to date;
- Assessment of the risk to bat species;
- Assessment of the significance of potential impacts on bat species;
- Design of appropriate mitigation measures to reduce these impacts to acceptable levels where necessary;
- Sensitivity mapping for the site; and
- Design of an operational monitoring plan for the site.

9.3.3 Ecological Impact Assessment

SPECIALIST: Jamie Pote, Jamie Pote Consulting

The proposed Soutrivier Central WEF footprint will be assessed. The purpose of the specialist study will be to meet the authorities' requirements for Terrestrial Biodiversity Assessment and plant species assessment for the proposals and, as a minimum will include the following:

1. A comprehensive desktop study and identify potential risks for a vegetation and flora assessment report relating to of the site and immediate surrounding area. This will include the relevant Regional Planning frameworks and review of previous studies.
2. A single site visit to assess the following:
   a) Verification of findings of previous specialists.
   b) Broad level Field survey of vegetation, flora and habitats present (including any riparian vegetation or wetland vegetation).

c) Verify and update species list, identifying, highlighting and locating flora species that are of Conservation Concern, Threatened, Red Data species and species requiring permits for destruction/relocation in terms of NEMBA and any respective Provincial Ordinances. Mapping of any populations of such species observed during the site visit.
d) Mapping of the various habitat units and assessment of habitat integrity, ecological sensitivity, levels of degradation and transformation, alien invasion and flora species of special concern, the outcome being a detailed sensitivity map ranked into high, medium or low classes.

3. Detailed reporting will be comprised of a Draft Terrestrial Biodiversity Assessment Report (for public review and comment) and a Final Terrestrial Biodiversity Assessment Report for submission. The draft and final detailed reports will address the following (as per the gazetted Terrestrial Biodiversity Assessment Protocol):
   a) Indicate any assumptions made and gaps in available information. Assessment of all the vegetation types and habitat units within the relevant Regional Planning Frameworks.
   b) A detailed flora species list highlighting the various species of special concern categories (endemic, threatened, Red Data species and other protected species requiring permits for destruction/relocation and invasive/exotic weeds). Clearly indicate the need for any further permitting/licensing or detailed studies to specification of animal and plant species protocols.
   c) Faunal assessment will be compromised of a general fauna desktop assessment, as well as specific taxa specialist assessments, which would include on-site assessments as required and camera trapping. It is not anticipated that any methods requiring fauna capture will be followed.
   d) Description and assessment of the habitat units and site sensitivities ranked into high, medium or low classes based on sensitivity and conservation importance. A standard methodology has been developed based on other projects in the specific area.
   e) A habitat sensitivity map will be compiled, indicting the sensitivities as described above, inclusive of a riparian delineation for the aquatic report.
   f) A map indicating buffers to accommodate Regional Planning requirements (if required).
   g) Assessment of Impacts and Mitigation Measure, as well as specific measure that may be required for alternative development plans.
   h) A comprehensive EMPr for inclusion in the reports and EMPr with specific management actions for construction and Operation.
   i) Address any comments raised by IAP's or identified in the project in the final draft and final report.

9.3.4 Riverine Rabbit Impact Assessment

SPECIALIST: Christy Bragg, Bohemian Scientist

In order to developer a formal Riverine Rabbit Impact Assessment for the EIA phase of this project, Bohemian Scientist has been assessing and monitoring the proposed site. The following methodology is relevant to this study, the results of which will be formalised into an impact assessment report using the methodology described below in Chapter 9.

Site characterization:
The site was visited on two occasions for the study, firstly in November (2021), and secondly in January (2022) by Aliénor Brassine (Fauna Specialist). The site visit was conducted in two phases: an initial assessment of habitat suitability, informed by the desktop study, and a secondary camera trapping survey.

Habitat suitability assessment:
The AOI was visited in September 2021, where areas previously identified at a desktop level were groundtruthed, with their potential capacity to support healthy Riverine Rabbit populations assessed. Areas deemed suitable for Riverine Rabbit occurrence were photographed and given a habitat suitability score, ranging from 0–100%.

Species survey:
Camera trapping: The EWT DCP has successfully utilised remote camera trapping to detect and monitor a number of Riverine Rabbit populations throughout the Karoo, and it remains one of the few methods able to detect presence of this rare, elusive species. Camera traps were therefore used extensively throughout the site in this study to establish the presence or absence of Riverine Rabbit populations. They were also be used to characterise the fauna of the site more generally. A total of 39 Browning Trail Cameras (Command Ops ELITE: model number BTCX–4EX) were deployed throughout the study. Due to the scarcity and nocturnal nature of the target species, Browning Trail Cameras infrared LEDs were preferable to standard flash, as white flashes have been shown to impact species' detectability (Larrucea et al., 2007). All cameras were mounted on metal stakes at a height of approximately 30 – 40cm above the ground. A 30s delay was programmed between successive photographs, and the sensor sensitivity set to high.

Sites were selected using a random stratified design throughout the riparian zone present in the site. All 39 sites were distributed throughout the three main Riverine Rabbit habitat sensitivity zones (as previously identified in a feasibility study by Christy Bragg [namely: Low, Medium, High). Within sites, cameras are placed where there were signs of target animal activity (e.g. intersecting trails of a diameter suitable for lagomorphs) to maximise detection of Riverine Rabbits. Cameras were placed randomly within each sensitivity unit. All cameras were operational for a minimum of 40 days. The camera placement was submitted for comment, suggested edits were made and the grid approved by the Riverine Rabbit Programme staff at the EWT. After anomalously heavy rainfalls occurred, a second survey was undertaken using roughly the same grid, but with some adjustments to avoid rivers and to check patches of suitable habitat not captured in the first randomized grid. It was considered necessary, given the suitability of the habitat, the proximity of historical sightings and the possibility of influxes of the species after the drought-breaking rains to redo the survey.

An ecological sensitivity map was created by integrating the results of the site visits with the latest available ecological and biodiversity literature. This will be formalised into a Riverine Rabbit Impact Assessment Report.

9.3.5 FRESHWATER IMPACT ASSESSMENT

SPECIALIST: Christel du Preez, FEN Consulting

The following points highlight the envisaged activities and tasks which will be undertaken during the Freshwater Impact Assessment, which will be prepared as part of the EIA phase of the project:

- The PES, EIS, and ecological service provision of the watercourses will be highlighted, and expected impacts on the systems will be assessed and mitigation measures provided that must be implemented in order to maintain and enhance the ecological integrity of the affected watercourses;
- The EIS of the watercourses will be determined according to the method described by Rountree and Kotze, (2013);
- The services provided by the watercourses associated with the study area and 500 m investigation area will be assessed according to the method of Kotze et al (2020) in which services to the ecology of the study area as well as services to the people of the area were defined;
- The Present Ecological State (PES) of the watercourses will be assessed according to the resource directed measures guideline as advocated by Macfarlane et al., (2008) or DWAF (2007) as applicable; and
- Impacts predicted to occur should be assessed according to a pre-defined impact assessment methodology (as per CES methodology).

9.3.6 ARCHAEOLOGICAL (HERITAGE) IMPACT ASSESSMENT

SPECIALIST: Nelius Kruger, CES

The Northern Cape Province has a long and extensive Colonial Period settlement history. Archaeological, palaeontological and/or cultural sites of significance are likely to be present within the Soutrivier Central WEF project areas. The protection and / or mitigation of sites of high heritage value is essential to avoid the loss of sites of cultural importance. In addition, the correct identification and recovery of sites of archaeological, palaeontological and/or cultural importance could potentially provide a better understanding of the heritage and/or geological history of the area.

Heritage resources in the project area are most probably localised and spatially confined and project impact areas can easily be micro sited during the EIA phase to avoid sensitive heritage resources where necessary. Here, a detailed archaeological walkthrough of final project impact areas will be required as part of a Heritage Impact Assessment subject to the EIA Phase. Final project layouts can then be adjusted to satisfactorily avoid any sensitive areas or alternatively, heritage resources that cannot be avoided and that are directly impacted by the proposed development can be excavated / recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the environmental management plan, whence they can be managed.

It should be noted that observations in this Heritage Scoping Memorandum is based on off-site desktop findings and the heritage impact emanating from the proposed Soutrivier Central WEF remains tentative pending further detailed site inspection as part of the Heritage Impact Assessment (HIA) process, subject to section 38 of the National Heritage Resources Act (NHRA - Act 25 of 1999) during the EIA.

The following recommendations are made based on the potential heritage risk of the project area.

- The HS should be expanded to an integrated Phase 1 Heritage Impact Assessment (HIA) including findings of a walkdown of final project impact areas to document all sites, features and objects.
- Under no circumstances may any artefacts be removed, destroyed or interfered with by anyone on the site; and Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51.
- 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 its surroundings and due cognisance should be taken of these sites of “Living Heritage” in the cultural landscape.
- It is recommended that all graves and cemeteries that might occur in the project surrounds be conserved and excluded from impact emanating from any future development. Where impact on such resources would prove to be inevitable, the correct human remains repatriation procedures should be observed at all times. These procedures should include public notification of intent to relocate the remains, consultation with descendant communities, close liaison with - and approval from local futurities, adherence to any local laws and / bylaws, and correct grave relocation methodologies.
- 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.
- Ultimately, it is recommended that the archaeological and cultural heritage of this part of the Northern Cape Province be respected. The management of heritage resources, as stipulated by National and International Heritage resources agencies (e.g. SAHRA) should be aligned with any future activity by

means of cultural mitigation and / or management plans developed in conjunction with heritage authorities and specialists.

9.3.7 PALEONTOLOGICAL IMPACT ASSESSMENT

SPECIALIST: John Almond, Natura Viva cc

The Scope of Work for the Palaeontological Specialist Assessment, which will form part of the EIA phase of this project, includes the following tasks:

- Undertake a site inspection to identify the site sensitivities, and verify them in terms of the National Web-Based Screening Tool (https://screening.environment.gov.za/).
- Determination, description and mapping of the baseline environmental conditions (geology / palaeontology) and palaeosensitivity of the study areas in question. Specify development setbacks / buffers, and provide clear reasons for these recommendations. This environmental screening will inform the layout.
- Conduct field surveys and compile specialist studies in adherence to: (a) the gazetted Environmental Assessment Protocols of the NEMA EIA Regulations (2014, as amended), where applicable (i.e. Part A - General Protocol for the Site Sensitivity Verification and Minimum Report Content Requirements where a Specialist Assessment is required but no specific Environmental Theme Protocol has been prescribed (GG 43110 / GNR 320, 20 March 2020)); (b) Appendix 6 of the NEMA EIA Regulations (2014, as amended) (GG 40772 / GNR 326, 07 April 2017); (c) National Heritage Resources Act (Act No. 25 of 1999), as applicable; and (d) any additional relevant legislation and guidelines that may be deemed necessary
- Provide sensitive features spatial data in a useable GIS format (kmz / shp);
- Assess the direct, indirect and cumulative impacts associated with the proposed renewable energy and grid connection developments, with and without mitigation;
- Address relevant concerns / comments raised by Interested and Affected Parties and Stakeholders, including the Competent Authority, during Public Participation Processes on the respective Draft Scoping and EIA Reports and BA Reports;
- Identify relevant permits that may be required;
- Recommend mitigation measures, best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts to be included in the respective Environmental Management Programmes (EMPr);
- Update draft specialist assessment reports after Environmental Assessment Practitioner (EAP) and Client review (before public release) and following public review for submission to the Competent Authority for decision-making; and
- Address any queries from the Competent Authority during the decision-making phase (as and when they arise).

All palaeontological specialist work should conform to international best practice for palaeontological fieldwork and the study (e.g. data recording fossil collection and curation, final report) should adhere as far as possible to the minimum standards developed by SAHRA (2013).

9.3.8 NOISE IMPACT ASSESSMENT

SPECIALIST: Morne de Jager, Enviro-Acoustic Research

The purpose of an environmental noise impact investigation and assessment is to determine and quantify the acoustical impact of, or on a proposed development.

The methodology with regards to the Noise Impact Assessment, which will form part of the EIA phase of this process, is as follows:

- Detailed processing of the ambient sound level data as measured during the site visit. The data will be analysed to motivate appropriate noise limits;
- Information as received from the developer will be used to model the potential noise impact. The following information will be considered:
    - The Sound Power Emission details of a wind turbine that may be used at this WEF;
    - The latest WEF layout to be assessed;
    - The topographical surface contours of the project focus area;
    - Surface and meteorological constants;
- The potential impact will be evaluated (where possible) in terms of the nature (description of what causes the effect, what/who might be affected and how it/they might be affected) as well as the extent of the impact;
- The potential significance of the identified issues will be calculated based on the evaluation of the issues/impacts;
- The development of an Environmental Management Plan and a proposal of potential mitigation measures (if required); and
- Conclusion and associated recommendations.

9.3.9 Socio-economic Impact Assessment

SPECIALIST: Marcelle Terblanche, INDEX

The nature of the proposed project deems it necessary to conduct a Socio-economic Impact Assessment. This process will include:

- The provision of a detailed description of the socio-economic environment in and around the project area.
- Analysis the potential impacts of the proposed project.
- Provision of guidelines for limiting or mitigating negative impacts and optimising benefits.

The specific terms of reference are as follows:

- Describe the local social environment, with particular reference to the possible labour-sending communities.
- Determine the current land-use patterns of the development area and the areas outside of the development boundary that are likely to be affected.
- Assess the significance of potential environmental and social impacts on the local populace and the district.
- Evaluate how the project could contribute to Local Economic Development (LED) in line with the Integrated Development Plans (LED) of the local and district municipalities.
- Establish a baseline understanding of current state of livelihoods, income sources, education levels and food security.
- Investigate possible impacts on livelihoods, income levels, education levels, food security and other factors relevant to the affected communities, as per the methodology described in Chapter 9 below.
- Consultation with stakeholders and I&APs.
- Develop a monitoring programme to ensure effective implementation of the recommended mitigation measures.

9.3.10 Visual Impact Assessment

SPECIALIST: Bryony van Niekerk, NuLeaf Planning and Environmental

The primary goal of the Environmental Impact Assessment (EIA) Phase Visual Impact Assessment (VIA) report will be to ensure that visual impacts are adequately assessed and considered so that the relevant authorities

can decide if the proposed WEF has unreasonable or undue visual impacts. The secondary aim is to identify effective and practical mitigation measures, if possible.

Since the purpose of a VIA is not to predict whether specific individuals or entities will find this type of development (renewable wind energy facility) pleasing or not but instead to identify the important visual features of the surrounding landscape, especially the features and characteristics that contribute to scenic quality, as the basis for determining how and to what degree a particular project will impact on those scenic values. The study will include the following:

1. Refinement of the baseline study, description of the visual character of the sites and zone of visual influence, if required.
2. Adjust the list of identified visual impacts resulting from the proposed development (with consideration of any public and/or relevant authorities' comments), if required.
3. Assessment of visual impacts based on the following VIA rating criteria, namely:
   a) Quality of the affected environment (landscape) – the aesthetic excellence and significance of the visual resources and scenery;
   b) Viewer incidence, perception and sensitivity – the level of acceptable visual impact is influenced by the type of visual receptors.
   c) Determine the Visual Absorption Capacity (VAC) – the capacity of the receiving environment to absorb the potential visual impact of the proposed development;
   d) Refine the potential visual exposure (visibility) - the geographic area from which the project may be visible based on any layout changes undertaken between the Scoping and EIA Phase;
   e) Refine the Shadow Flicker Assessment – based on any layout changes undertaken between the Scoping and EIA Phase, determine the affected zone caused when the shadow of an object repeatedly passes or pulsates over the same point in the landscape;
   f) Determine the cumulative visual exposure - the combined or incremental effects resulting from changes caused by a proposed development in conjunction with other existing or proposed activities;
   g) Visual Impact Index - the combined results of visual exposure, viewer incidence / perception and visual distance of the proposed facility. Values are assigned for each potential visual impact per data category and merged in order to calculate the visual impact index;
4. Assessment of the significance of the visual impacts, rated according to methodology outlined in Section 9 below, which includes:
   a) Extent, duration, magnitude and probability to determine significance; and
   b) Significance considered with status (positive, negative or neutral) and reversibility (reversible, recoverable or irreversible) following decommissioning of the proposed facility.
5. Impacts will be rated before mitigation and after, assuming mitigation is possible.
6. Development of mitigation measures to reduce visual impacts and enhance any positive visual benefits, where possible.
7. Undertaking of photo simulations (in addition to the spatial analyses) in order to illustrate the potential visual impact of the proposed facility within the receiving environment.

9.4 ENVIRONMENTAL IMPACT REPORT (EIR)

The main purpose of this report is to gather and evaluate environmental information, so as to provide sufficient supporting arguments to evaluate overall impacts, consider mitigation measures and alternative options, and make a valued judgement in choosing the best development alternative. The EIR is made available for public and authority review. The availability of the report is advertised in the local newspaper and is situated at an easily accessible location.

9.5 ISSUES AND RESPONSE TRAIL

The issues and response trial consists of the compilation of comments, issues and concerns raised by I&APs and the authorities as well as the relevant responses to these comments.

9.6 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

The EMPr informs the client and the technical team of the guidelines which will need to be followed during construction to ensure that there are no lasting or cumulative negative impacts of the construction process on the environment.

- The standards and guidelines that must be achieved in terms of environmental legislation.
- Mitigation measures and environmental specifications which must be implemented for all phases of the project in order to minimise the extent of environmental impacts, to manage environmental impacts and where possible to improve the condition of the environment.
- Provide guidance through method statements that are required to be implemented to achieve the environmental specifications.
- Define corrective action that must be taken in the event of non-compliance with the specifications of the EMPr.
- Prevent long-term or permanent environmental degradation.

In addition to this, the Public Participation Process (PPP) is a continuous process. As for the Scoping Phase, opportunity is provided for I&APs to voice concerns and issues regarding the project. At this stage the project details may have changed in response to the preliminary findings of the Draft Scoping Report. I&APs and key stakeholders are also given the opportunity to review the Environmental Impact Report (EIR) before it is submitted to the authorities.

9.7 ENVIRONMENTAL AUTHORISATION (EA) AND APPEALS PROCESS

Upon thorough examination of the EIR, the authority will either issue an Environmental Authorisation (EA), which either authorises the project or refuses authorisation. Should authorisation be granted, it usually carries Conditions of Approval. The proponent is obliged to adhere to these conditions. Once the authorisation has been issued, it is publicised, and the public are given 20 calendar days from the issuing of the authorisation to lodge an appeal with the authorities.

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9.8 THE PUBLIC PARTICIPATION PROCESS (PPP)

The primary aims for the PPP include the following:

- Disclose activities planned by the project proponent and the EIA team;
- Identify and respond to concerns, grievances and enquiries made by the I&APs;
- Harness local expertise, needs and knowledge from the I&APs;
- Identify additional or new stakeholders and people affected by, or interested in, the proposed project;
- Ensure that all issues and enquiries raised by I&APs have been adequately assessed and addressed;
- Share the findings of the EIA and specialists studies, such as significant impacts, mitigation measures, management actions, and monitoring programmes; and
- Address and include any new concerns or comments that arise.

The PPP commenced during the Scoping Phase and will continue during the EIA Phase, during which I&APs are afforded further opportunities to raise their issues, concerns and comments regarding the proposed project. It is possible that some of the project details may have changed in response to the preliminary findings presented in the Final Scoping Report, and as a result of design changes made by the project proponent. I&APs and key stakeholders are given the opportunity to review the Draft EIR before it is submitted to the authorities for consideration. Comments on the Draft EIR received from I&APs will be included and addressed in the Final EIR.

9.8.1 INITIAL PPP

Stakeholders which are likely to be affected by the proposed Soutrivier Central WEF will be included in the initial I&AP Database, these will include the relevant departments, landowners and surrounding landowners. In addition, individuals who contact CES for information on the Soutrivier Central WEF project, due to notification by means of the onsite signage, the advertisement or word-of-mouth, etc. will be registered on the I&AP Database. These registered I&APs will receive a BID, consisting of an overview of the proposed Soutrivier Central WEF project.

9.8.2 PUBLIC REVIEW OF THE DRAFT SCOPING REPORT (DSR)

All I&APs included in the Register of I&APs, will be notified in writing of the availability of the DSR for public review. The notification letter will provide details of the 30-day public comment period, the venues and websites where the report could be viewed, the contact details of the PPP consultant and how written comments on the DSR should be submitted.

9.8.3 PUBLIC REVIEW OF THE DRAFT ENVIRONMENTAL IMPACT REPORT (DEIR)

All I&APs on the Register of I&APs will be notified in writing of the availability of the DEIR for public review. The notification letter will provide details of the 30-day public comment period, the venues and websites where the report can be viewed, the contact details of the PPP consultant and how written comments on the DEIR should be submitted, and details of the public meeting to present the DEIR.

9.8.4 NOTIFICATION OF ENVIRONMENTAL AUTHORISATION (EA)

Advertisements announcing the Environmental Authorisation will be placed in the same regional and local newspapers used to announce the project and the EIA. The adverts will be placed in the local newspaper. The adverts will inform I&APs of the decision and where the decision can be accessed and will draw their attention to their right to appeal the decision and set out the appeal procedures.

9.9 ENVIRONMENTAL IMPACT REPORT (EIR)

The Specialist Studies described in Section 9.3 will inform the EIR. In addition, the EIR will gather any comments received from I&APs and determine whether it is necessary to increase the scope of work or amend the Terms of Reference for the specialists. The EIR will examine the 'No-Go' alternative along with the proposed development, as required in the EIA regulations.

9.9.1 STRUCTURE OF THE EIA REPORT

Proposed structure of EIR:

To avoid the EIR being excessively long and cumbersome, whilst meeting the content requirements specified in the NEMA EIA regulations, the final report will be divided into a number of volumes indicated in Table 9-2.

Table 9-2. Reports that will be generated in the EIA phase for the proposed Soutrivier Central WEF

REPORT	CONTENTS
Environmental Impact Report (EIR)	This report will contain the following; **1. Introduction** • Detail of the environmental assessment practitioner who compiled the report • Expertise of the EAP to carry out an environmental impact assessment **2. Description of the Project** • A description of the property on which the activity is to be undertaken • The location of the activity on the property • A description of the types of activities that are proposed for the development. **3. Description of the Affected Environment** • The natural environment • The socio-economic environment • The legal, policy and planning setting **4. The Public Participation Process** • Steps undertaken in order to notify and involve I&APs • Advertisements and media • Meetings held in the PPP • Comments and Response Report management **5. Summary of Comments and Response Trail** • Summary of comments and issues raised by I&APs and responses to the issues **6. Summary of Specialist Reports** • Summary of the findings and recommendations of all specialist studies **7. Alternatives Considered** • Description of all alternatives considered in the EIA • Initial screening of alternatives • Description and comparative assessment of all alternatives identified during the EIA **8. The Significance of Potential Environmental Impacts** • The methodology used to determine the significance of environmental impacts • Impacts on the natural environment • Impacts on the socio-economic environment • Impacts on the legal, policy and planning setting **9. Environmental Impact Statement** • A summary of the key findings of the EIA • Comparative assessment of the positive and negative implications of the proposed activity and identified alternatives **10. Conclusions** • Mitigation measures for identified adverse environmental impacts • Opinion as to whether the activity should or should not be authorised

	➢ Any conditions that should be made in respect to any form of authorisation ***It should be noted that the above is not the exact Table of Contents for the EIA, but is intended to indicate the major topics that will be covered in the report.***
Specialist Studies	This will be a compilation of all the specialist studies undertaken in the EIA, and will include detailed assessments of - ➢ Avifaunal Impacts ➢ Bat Impacts ➢ Freshwater Impacts ➢ Heritage Impacts ➢ Noise impacts ➢ Paleontological Impacts ➢ Riverine Rabbit Impacts ➢ Socio-economic Impacts ➢ Terrestrial Ecological Impacts ➢ Visual Impacts
Comments and Response Report	This will include - **1. Lists of persons, organisations and organs of state that were registered as I&APs (limited information shared as per POPIA)** **2. Comments and Response Report for the Scoping and EIA phases** **3. Copies of any representations, objections and comments received from I&APs**
Environmental Management Programme (EMP)	Environmental management programme for key activities at the proposed renewable energy facility, which will contain the following - **1. Introduction** ➢ The details of the EAP who prepared the EMPr ➢ The expertise of the EAP to prepare an EMPr **2. Detailed description of the aspects of the activity covered by the EMPr** **3. Mitigation Measures and Actions** ➢ Planning and Design ➢ Pre-construction and construction activities ➢ Operation and undertaking of the activity ➢ Rehabilitation of the environment **4. Responsibilities** ➢ Persons responsible ➢ Time periods for implementation **5. Monitoring Programmes**

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10 PUBLIC PARTICIPATION

10.1 NOTIFICATION OF INTERESTED AND AFFECTED PARTIES

Public consultation is a legal requirement throughout the EIA process. Developers are required to conduct public consultation throughout the Scoping and EIR phase. Formal EIA documents are required to be made available for public review and comment by the proponent, these include the Project Brief, Scoping Report and Terms of Reference for the EIA, the draft and final EIA reports and the decision of the Competent Authority (DEA). The method of public consultation to be used depends largely on the location of the development and the level of education of those being impacted on by the project. Required means of public consultation include:

- Site notice(s);
- Newspaper advertisement(s);
- Letter of Notification and information to affected landowner(s), stakeholders and registered I&APs;
- Background Information Document (BID) distribution;
- Public meeting (Attendance register and meeting minutes); and
- Authority and Stakeholder engagement (DFFE, DWS, SAHRA, DMRE, etc.).

Please note that all proof of public notification will been attached as APPENDIX C.

10.1.1 NEWSPAPER ADVERTISEMENT

- 1st Advert: Volksblad, 29th of July 2022, please see APPENDIX C.

10.1.2 ONSITE NOTICES

- An onsite notice board has been erected at the entrance to the site: See APPENDIX C.

10.1.3 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 9-1, all relevant organisations will be invited to comment on the reports as and when available. This list is considered a live document and names will be added and/removed based on the consultation process. Proof of correspondence will be added to APPENDIX C.

PLEASE NOTE THAT DUE TO THE POPIA ACT, AND THE LIST BEING POPULATED BY THE EAP, ONLY FARM NAMES AND STAKEHOLDER NAMES ARE VISIBLE, NO PERSONAL INFORMATION WILL BE SHARED UNTIL CORRESPONDENCE HAS BEEN CIRULATED DURING PPP.

Table 9-1: Stakeholder and Organisational Database

Stakeholders
Department of Forestry, Fisheries and the Environment (DFFE)
Department of Forestry, Fisheries and the Environment (DFFE): Biodiversity & Conservation
Department of Nature Conservation and Environmental Affairs (Northern Cape)
Department of Water & Sanitation DWS (Northern Cape)
Department of Mineral Resources (DMR)
Northern Cape Tourism
Department of Energy

Eskom
Eskom: Renewable Energy
Pixley Ka Seme District Municipality: Environmental Officer
Ubuntu Local Municipality: Acting Municipal Manager
Ubuntu LM Ward 5 Councillor
Ubuntu LM Ward 6 Councillor
SALGA Northern Cape
South African Heritage Resources Agency (SAHRA)
Telkom
Sentech
Vodacom
MTN
Cell C
Civil Aviation Authority (CAA)
Air Traffic and Navigation Services (ATNS)
Roads (SANRAL/Public Works)
BirdLife South Africa
BirdLife South Africa: Birds and Renewable Energy Manager
BirdLife South Africa: Policy & Advocacy Manager
Endangered Wildlife Trust: CEO
Endangered Wildlife Trust: EIA
Endangered Wildlife Trust: Head of Conservation Science
Endangered Wildlife Trust: Wildlife & Energy Programme
WEF LANDOWNERS
RE/261
RE/250
RE/209
RE/208
RE/199
RE/199
RE/197
RE/196
RE/195
RE/148
RE/147
RE/145
6/158
4/158
4/145
3/200
3/158
2/212
2/208
2/200
2/199
1/250
1/211

1/201
1/200
1/197
GRID CONNECTION LANDOWNERS
RE/3
RE/265
RE/265
RE/249
RE/248
RE/232
RE/231
RE/229
RE/228
RE/222
RE/220
RE/213
RE/2
RE/199
RE/197
RE/195
RE/1
7/222
7/220
5/222
4/222
3/248
3/158
2/212
10/248
1/265
1/222
1/221
1/219
1/211
1/200
SURROUNDING LANDOWNERS
RE/8
RE/6
RE/273
RE/269
RE/262
RE/249
RE/213
RE/212
RE/205
RE/194
RE/158

RE/152
RE/148
RE/147
7/151
6/151
5/207
4/208
4/207
4/158
4/151
3/212
3/205
3/200
3/145
3/134
2/212
2/211
2/208
2/205
2/204
2/200
1/208
1/207
1/200
1/153
REGISTERED INTERESTED AND AFFECTED PARTIES
To be added as requests are received

10.1.4 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. These documents included the contact details of the EAP for the landowners to register themselves and/or submit their comments on the proposed development.

10.1.5 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 (Table 9-1).

10.1.6 THE PUBLIC PARTICIPATION PROCESS FOLLOWED AND TO BE FOLLOWED INCLUDES:

Release of the Draft Scoping Report for Authority, Stakeholder and Public review.

The Draft Scoping Report will be available for public review from the 29th of July 2022 to 29th of August 2022 (30 days, inclusive of one public holiday).

(a) Hard copies of the Draft Scoping Report will be made available at:

- Loxton Library, Margaretha Prinsloo St, Loxton
- Victoria West Library, 5 Queen Victoria Street, Victoria West

(b) Soft copies are available on the CES website (www.cesnet.co.za)

Release of the Draft Environmental Impact Assessment Report for Authority, Stakeholder and Public review

The Draft EIR will be made available for public review: anticipated dates – September/October 2022 to October/November (30 days)

(a) Hard copies of the Draft Environmental Impact Assessment Report will be available at:

- Loxton Library, Margaretha Prinsloo St, Loxton
- Victoria West Library, 5 Queen Victoria Street, Victoria West

(b) Electronic copies will be made available on the CES website (www.cesnet.co.za)

10.2 COMMENTS AND RESPONSE REPORT

The comments and response report will be a live and continuously updated report which details all comments received and the responses there to. This report will be included as Appendix D of the Final Scoping Report.

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11 CONCLUSIONS

11.1 CONCLUSION

Soutrivier Central Wind Energy Facility RF (Pty) Ltd., plans to develop, construct and operate a Wind Energy Facility (WEF) between the towns of Victoria West and Loxton in Ubuntu Municipality in the Northern Cape Province. The project site is situated in within the greater Pixley Ka Seme District Municipality. According to the data in the area, this project site appears to have favourable wind conditions to operate a wind farm.

The proposed Soutrivier Central Wind Energy Facility (WEF) will consist of up to 32 turbines, with a total facility output of up to 270MW. The WEF will also include a powerline and switching station in order to connect the WEF to the existing Eskom Substation (this will be applied for in a separate environmental application). The WEF will also include a Battery Energy Storage System (BESS), temporary and permanent laydown areas, an IPP Substation (SS), a Concrete Tower Manufacturing Facility (CTMF), access roads and a construction compound (CC) area. The construction footprint of the proposed WEF will be up to 125ha (inclusive of roads), rehabilitated to an operational footprint of up to 77ha (inclusive of roads).

The nature of the proposed site for the establishment of the WEF is suitably-placed on land currently used for livestock grazing. However, the establishment of the proposed Soutrivier Central WEF raises various issues pertaining to:

- Visual intrusion on the landscape.
- Noise impacts on surrounding land inhabitants.
- Ecological sensitivity (flora and fauna, particularly riverine rabbits).
- Avifaunal and bat sensitivity.
- Heritage sites and resources.
- Paleontological sites in terms of potential fossil deposits.
- Socio-economic impacts and benefits.

These key issues are to be comprehensively addressed and assessed according to the Terms of Reference developed for each specialist during the EIA phase.

11.2 OPINION

It is the opinion of the EAP that at this stage, no fatal flaws have been identified and there is no reason why the proposed Soutrivier Central WEF should not proceed to EIA the phase for further assessment.

A Water Use Licence (WUL) will be required for any construction activity within the extent of a watercourse (i.e. riparian and instream habitat (or within 100 m of the watercourse) or the 1:100 year floodline; whichever is the greatest) or within 500 m of a wetland in terms of the following triggers from the National Water Act (No. 36 of 1998):

- Sec 21 (c) - impeding or diverting the flow of water in a watercourse
- Sec 21 (i) - altering the bed, banks, course or characteristics of a watercourse.

The relevant WULs must be obtained from the Department of Water and Sanitation (DWS) prior to commencement of construction. In addition, any protected plant species that may need to be removed, will be subject to a plant removal permit either from NCPG and DFFE, prior to the removal or disturbance of such species.

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11.3 FATAL FLAWS

The current Draft Scoping Report has not identified any fatal flaws associated with the proposed Soutrivier Central WEF and suggest that there is no reason why the proposed development should not proceed to EIA phase for further assessment.

11.4 THE EIA PROCESS

The following activities will form part of the EIA phase:

- Public Participation: focus group meetings, public review of documentation;
- Specialist studies as described in the Plan of Study;
- Consultation with Stakeholders I&APs regarding possible significance of impacts and suitable mitigation measures;
- Evaluation of impacts prior to mitigation;
- Compilation of practical and effective mitigation measures;
- Evaluation of impacts after mitigation;
- Provision of an opinion as to whether or not the activity should be authorised;
- Compilation of an environmental impact statement; and
- Compilation of a draft Environmental Management Programme (EMPr).

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12 APPENDIX A | EAP DECLARATION

PLEASE FIND SIGNED EAP DECLARATION HERE WITHIN

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13 APPENDIX B | EAP CVs

PLEASE FIND EAP TEAM CVs HERE WITHIN

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14 APPENDIX C | PPP PROOFS

14.1 PROOF OF ADVERTISEMENT

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Kennis geskied hiermee ingevolge Regulasie 41(2) gepubliseer in Staatskennisgewing No. 982 kragtens Hoofstuk 6 van die Nasionale Omgewingsbestuurswet (WNOB) (Wet No. 107 van 1998, soos gewysig) Omgewingsimpakstudie (OIB) Regulasies (2014, soos gewysig) van die voorneme om 'n Aansoek om Omgewingsmagtiging (OM) in te dien vir die voorgestelde ontwikkeling van die Soutrivier Sentrale Windenergiefasiliteit (WEF) binne die Ubuntu Plaaslike Munisipaliteit van die Noord-Kaap Provinsie. Die aktiwiteit sal op die volgende plaasgedeeltes plaasvind: Plaas 197, Oorblywende Gedeelte (OG); Plaas 158, Gedeelte 3; en Plaas 158, Gedeelte 6.

Die voorgestelde Soutrivier Sentrale Windenergiefasiliteit (WEF) sal uit tot 32 turbines bestaan, met 'n totale fasiliteitsuitset van tot 270MW. Die WEF sal ook 'n kraglyn en skakelstasie insluit om die WEF aan die bestaande Eskom Substasie te koppel (daaroor sal in 'n aparte omgewingsaansoek aansoek gedoen word). Die WEF sal ook 'n battery-energie-bergingstelsel (BEBS), tydelike en permanente lêgebiede, 'n Onafhanklike Krag Produsent-substasie, 'n betontoring-vervaardigingsfasiliteit (BTVF), toegangspaaie en 'n konstruksieverbinding (KV)-area insluit. Die konstruksie-voetspoor van die voorgestelde WEF sal tot 125ha (paaie ingesluit), gerehabiliteer tot 'n operasionele voetspoor van tot 77ha (insluitend paaie).

Die ontwikkeling van die voorgestelde Soutrivier Sentraal WEF aktiveer NEMA (Wet No. 107 van 1998, soos gewysig) OIB-regulasies (2014, soos gewysig) Noteringskennisgewing 1, 2 en 3 aktiwiteite, insluitend Noteringskennisgewing 2 Aktiwiteit 1 vir die ontwikkeling van fasiliteite of infrastruktuur vir die opwekking van grootskaalse hernubare energie; en vereis dus 'n Omvangbepaling en OIB-proses. Coastal and Environmental Services (Edms) Bpk., wat handel dryf as "CES", is aangestel om die vereiste Bestekopname en OIB-proses te onderneem. Die bevoegde owerheid vir hierdie aansoek om Omgewings Magtiging (OM) is die nasionale departement van bosbou, visserye en die omgewing (DBVO).

Vir verdere informasie, registrasie as 'n Belanghebbende en/of Geaffekteerde Party (B&AP) of indiening van skriftelike kommentaar, kontak asseblief vir Me Caroline Evans via pos, telefoon of epos: Posbus 934, Makhanda (Grahamstad), 6140 | Tel: +27 (0)466222364 | Epos: reppp@cesnet.co.za
* Sluit asseblief die projek verwysing in by alle korrespondensie: ***Soutrivier Sentrale WEF.***

KENNISGEWING: POPIA ("Protection of Personal Information Act" – Beskerming van Persoonlike Informasie Wet) Vrywaring. Alle Belanghebbende- en B&GP-databasisse moet vanaf 1 Julie 2021 aan die Wet voldoen. Indien u as 'n B&GP op die Belanghebbende- en B&GP-databasis wil registreer, benodig ons as die administrateurs van die Soutrivier Sentrale WEF Belanghebbende en B&GP-databasis u toestemming om deel te wees van hierdie databasis. As sodanig word u hiermee in kennis gestel dat u geregtig is om sodanige toestemming te weier en u kan so 'n reg uitoefen deur in enige stadium van die proses skriftelik van hierdie databasis te onttrek. Sou u kies om in hierdie groep aan te bly, sal dit aanvaar word dat u ingestem het om deel te wees van hierdie databasis en dat u persoonlike inligting (synde joernaam, affiliasie, kontakbesonderhede en skriftelike kommentaar) sigbaar is vir enige persoon wat in die projek belangstel sowel as in die publieke domein. In hierdie verband doen ons 'n beroep op alle lede van hierdie databasis om NIE van sodanige persoonlike inligting gebruik te maak vir watter rede ook al sonder om die toestemming van die betrokke persoon(e) te verkry nie.

14.2 PROOF OF SIGNAGE

Signage has been erected on the eastern access road to the site. Please see proof below.

CES
NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE
SOUTRIVIER CENTRAL WIND ENERGY FACILITY (WEF),
UBUNTU LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE
21/07/2022 13:05

21/07/2022 13:05

PLEASE NOTE THAT THE REMAINING PPP PROOFS WILL BE ADDED TO THE FINAL SCOPING REPORT

DRAFT