SOYUZ 1 WIND ENERGY FACILITY (WEF), EMTHANJENI LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

DFFE Reference Number: 14/12/16/3/3/2/2205

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

PREPARED FOR:

SOYUZ 1 (Pty) Ltd.

PREPARED BY:

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Report Title: Soyuz 1 Wind Energy Facility: Environmental Impact Assessment Report (EIR)

Report Version: Draft

Department of Forestry, Fisheries, and the Environment (DFFE) Reference Number: 14/12/16/3/3/2/2205

CES Project Code: P40700768

Environmental Assessment Practitioner (EAP) Details:

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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*	March 2023
Robyn Thomson	*Project Manager & Lead Author*	March 2023

CONTENTS OF AN ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CONTENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (APPENDIX 3, NEMA EIA REGULATIONS)		
3. (1) An environmental impact assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include –		
	CONTENT	**SECTION OF THIS REPORT**
(a)	**Details of –**	***Chapter 1 and Appendix B***
(i)	The EAP who prepared the Report.	
(ii)	The expertise of the EAP, including a *curriculum vitae.*	
(b)	**The location of the development footprint of the activity on the approved site as contemplated in the scoping report, including –**	***Chapter 2***
(i)	The 21-digit Surveyor General code of each cadastral land parcel.	
(ii)	Where available, the physical address and farm name.	
(iii)	Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	
(c)	**A plan which locates the proposed activity or activities applied for as well as the associated infrastructure at an appropriate scale, or, if it is –**	***Chapter 2***
(i)	A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken.	
~~(ii)~~	~~On land where the property has not been defined, the coordinates within which the activity is to be undertaken.~~	
(d)	**A description of the scope of the proposed activity, including –**	***Chapter 2***
(i)	All listed and specified activities triggered and being applied for; and	
(ii)	A description of the activities to be undertaken, including associated structures and infrastructure.	
(e)	**A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.**	***Chapter 4***
(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 development footprint within the approved site as contemplated in the accepted scoping report.**	***Chapter 3***
(g)	**A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report.**	***Chapter 3 and Chapter 7***
(h)	**A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including –**	***Chapter 7***
(i)	Details of the development footprint alternatives considered.	***Chapter 7, Chapter 8, Chapter 9 and Chapter 10***
(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 11 and Appendix A***
(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.	***Chapter 11, Appendix A and Appendix H***
(iv)	The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	***Chapter 5 and Chapter 6***
(v)	The impacts and risks identified 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 9***

(vi)	The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks.	
(vii)	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	
(viii)	The possible mitigation measures that could be applied and level of residual risk.	
(ix)	If no alternative development footprints for the activity were investigated, the motivation for not considering such.	
(x)	A concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report.	
(i)	**A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including –**	
(i)	A description of all environmental issues and risks that were identified during the environmental impact assessment process.	
(ii)	An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adopted mitigation measures.	
(j)	**An assessment of each identified potentially significant impact and risk, including –**	
(i)	Cumulative impacts	***Chapter 8, Chapter 9 and Chapter 10***
(ii)	The nature, significance and consequences of the impact and risk	
(iii)	The extent and duration of the impact and risk.	
(iv)	The probability of the impact and risk occurring.	
(v)	The degree to which the impact and risk can be reversed.	
(vi)	The degree to which the impact and risk may cause irreplaceable loss of resources.	
(vii)	The degree to which the impact and risk can be mitigated.	
(k)	**Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;**	
(l)	**An environmental impact statement which contains –**	
(i)	A summary of the key finding of the environmental impact assessment.	
(ii)	A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers	
(iii)	A summary of the positive and negative impacts and risks of the proposed activity and identified alternative.	
(m)	**Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation**	***Chapter 12***
(n)	**The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment**	
(o)	**Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation**	
(p)	**A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.**	
(q)	**A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation**	

(r)	**Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised**	
(s)	**An undertaking under oath or affirmation by the EAP in relation to –**	***Chapter 13***
(i)	The correctness of the information provided in the report.	
(ii)	The inclusion of comments and inputs from stakeholders and I&APs.	
(iii)	The inclusion of inputs and recommendations from the specialist reports where relevant; and	
(iv)	Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	
(t)	**Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.**	
(u)	**An indication of any deviation from the approved scoping report, including the plan of study, including –**	***None at this stage***
(i)	Any deviation from the methodology used in determining the significance of potential environmental impacts and risks	
(ii)	A motivation for the deviation.	
(v)	**Any specific information that may be required by the competent authority.**	***Throughout this Report***
(w)	**Any other matters required in terms of section 24 (4) (a) and (b) of the Act.**	***None at this stage***

ENVIRONMENTAL IMPACT ASSESSMENT TEAM

Environmental Consultants	**Alan Carter,** Project Leader & The EAP *CES* **Robyn Thomson,** Project Manager, Lead Author & GIS Mapping *CES*
Agricultural Specialist	**Mariné Pienaar,** Agricultural Specialist *TerraAfrica*
Avifaunal Specialist	**Owen Rhys Davies,** Avifaunal Specialist *Arcus Consultancy Services*
Bat Specialist	**Craig Campbell,** Bat Specialist *Arcus Consultancy Services*
Botanical Specialist	**Tarryn Martin,** Botanical Specialist *Biodiversity Africa*
Freshwater Specialist	**Aidan Gouws,** Freshwater Specialist *CES* **Ryan Edwards,** Freshwater Specialist (Review) *Verdant Environmental*
Faunal Specialist	**Amber Jackson,** Faunal Specialist *Biodiversity Africa*
Heritage Specialist	**Nelius Kruger,** Archaeological Specialist *CES*
Noise Specialist	**Morné de Jager,** Acoustic Specialist *Enviro Acoustic Research, MENCO*
Paleontological Specialist	**Elize Butler,** Paleontological Specialist *Banzai Environmental*
Socio-Economic Specialist	**Hilda Bezuidenhout,** Socio-economic Specialist *CES*
Traffic Specialist	**Adrian Johnson,** Traffic Specialist *JG Afrika*
Visual Specialist	**Peter Velcich,** Visual Specialist *NuLeaf Planning and Environmental*

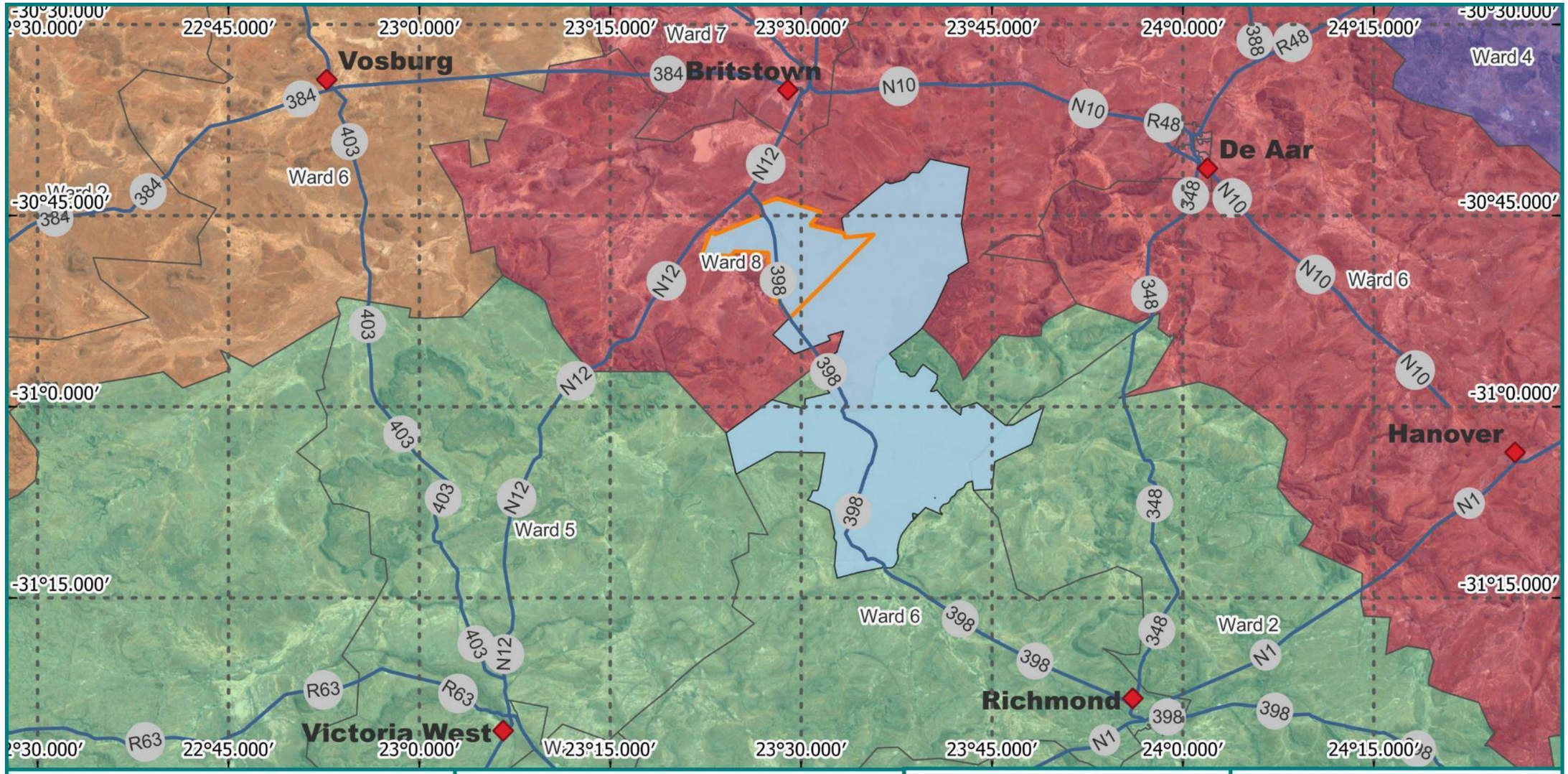
PROJECT SUMMARY

PROJECT SPECIFICATIONS	
Name of Facility	Soyuz 1 Wind Energy Facility
Province	Northern Cape
District Municipality	Pixley Ka Seme District Municipality
Local Municipality	Emthanjeni Local Municipality
Farm Numbers and Portions	Remaining Extent (Portion 0) of the Farm Perdepoort No. 169; Portion 1 of the Farm Perdepoort No. 169; Portion 11 (a portion of portion 2) of the Farm Nieuwejaarsfontein No. 147; Portion 9 (a portion of portion 1) of the Farm Nieuwejaarsfontein No. 147; Portion 6 of the Farm Nieuwejaarsfontein No. 147; Portion 1 of Farm Nieuwejaarsfontein No. 147; Remaining Extent (Portion 0) of Farm No. 145; and Portion 0 of Farm 144.
Study Area Extent (ha)	16 200 ha
Facility Footprint (ha)	***CONSTRUCTION PHASE*** Up to 215 ha ***OPERATIONAL PHASE*** Up to 150 ha
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 ***IMPACT ASSESSMENTS*** Agricultural Impact Assessment Ecological Impact Assessment Freshwater Impact Assessment Faunal Impact Assessment Heritage (Archaeological) Impact Assessment Noise Impact Assessment Palaeontological Impact Assessment Socio-economic Impact Assessment Visual Impact Assessment Traffic/Transportation Assessment

SOYUZ 1 WEF DESIGN SPECIFICATIONS	
Number of turbines	Up to 75
Concrete turbine foundations	Up to 7.68 ha
Turbine, crane and blade hardstands	Up to 37.5 ha
Cabling between turbines	To be laid underground where practical
Power output per turbine	Unspecified
Facility output	Up to 480 MW
Turbine hub height	Up to 160 m
Turbine rotor diameter	Up to 200 m
Turbine blade length	Up to 100 m
Turbine tip height	Up to 260 m
Access road width	Up to 12 m

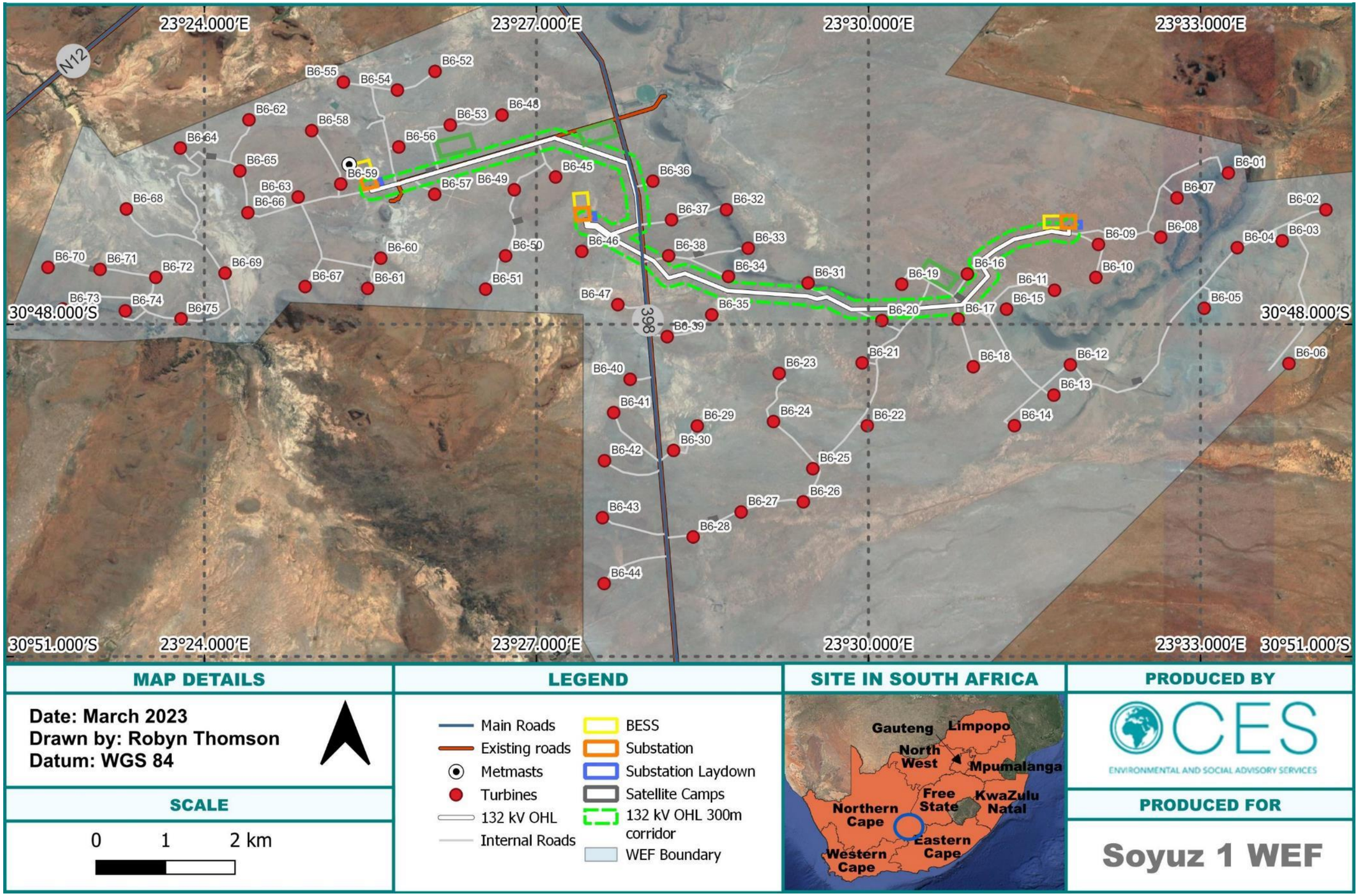
SOYUZ 1 WEF DESIGN SPECIFICATIONS	
Access road length	New roads up to 75 km Existing road upgrades up to 20 km
BESS Technology	Solid State (Li-Ion) footprint up to 5 ha
On-site substations	Up to 6 ha
Main Construction Camp Areas	Up 36.75 ha (combined) during construction. To be fully rehabilitated.
Satellite Laydown Areas	Up to 6 ha (combined) during construction. To be fully rehabilitated.
Substation Laydown Areas	Combined footprint of up to 2.4 ha
Concrete Batching Plants	To be located at the construction camp area and the satellite laydown areas.
Operation and Maintenance buildings	Combined footprint of up to 6 ha
Overhead Powerline	OHL length of approximately 14.5 km. Servitude width of up to 31 m. Pylon spacing between 100m - 300m.

SOYUZ 1 WEF LOCALITY MAP



MAP DETAILS	LEGEND	SITE IN SOUTH AFRICA	PRODUCED BY
Date: July 2022 Drawn by: Robyn Thomson Datum: WGS 84	Towns Roads Wards 2021 WEF Boundary Soyuz WEF cluster **Local Municipalities** Emthanjeni Kareeberg Thembelihle Ubuntu	Gauteng, Limpopo, North West, Mpumalanga, Free State, KwaZulu Natal, Northern Cape, Eastern Cape, Western Cape	CES ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES **PRODUCED FOR** Soyuz 1 WEF
SCALE 0 10 20 km			

SOYUZ 1 WEF LAYOUT MAP



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1 INTRODUCTION

1.1 BACKGROUND INFORMATION

The Soyuz 1 Wind Energy Facility (WEF) is located approximately 22 km south of Britstown in the Northern Cape Province. The project site is situated in the Emthanjeni 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 Soyuz 1 (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 PURPOSE OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIR)

The objective of the EIA process, as set out by the 2014 EIA Regulations (as amended in 2017), is to, "*through a consultative process-*

(a) Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;

(b) Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;

(c) Identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) Determine the—

> *(i) Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and*
>
> *(ii) Degree to which these impacts—*
>
> > *(aa) Can be reversed;*
> >
> > *(bb) May cause irreplaceable loss of resources, and*
> >
> > *(cc) Can be avoided, managed or mitigated;*

(e) Identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;

(f) Identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;

(g) Identify suitable measures to avoid, manage or mitigate identified impacts; and

(h) Identify residual risks that need to be managed and monitored".

1.3 NATURE AND STRUCTURE OF THIS REPORT

The structure of this report is based on Appendix 3 of GN R. 982 (326), of the EIA Regulations (2014 and subsequent 2017 amendments), which clearly specifies the required content of an Environmental Impact Assessment Report (EIR).

This report is the second of a number of reports which will be produced during the EIA Process. The Scoping Report, which was part of phase 1 of this process, has been completed and accepted by the department. The EIA phase (phase 2) includes an EIR (prepared in accordance with Appendix 3 of GN R. 982), specialist reports (prepared in accordance with Appendix 6 of GN R. 982) and an Environmental Management Programme (EMPr) (prepared in accordance with Appendix 4 of GN R. 982). This phase must also undergo Public Participation Process in accordance with Chapter 6 of GN R. 982.

1.3.1 STRUCTURE

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

Table 1-2: Structure of the EIR

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

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

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 EIR 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 30 years. He is a registered professional with the South African Council for Natural Scientific Professionals (SACNASP) and through Environmental Assessment Practitioners Association of South Africa (EAPASA). Alan has been the lead and EAP for over 20 windfarm EIAs over the past 10 years.

1.4.2 Ms Robyn Thomson (Project Manager & Lead Author)

Robyn is a Principal Environmental Consultant with more than 16 years' experience and she is based in the East London branch. She holds a BSc (Environmental Science) degree with majors in Archaeology, Environmental and Geographical Science, as well as a BSc (Hons.) in Environmental Science, with coursework in Environmental Management, Environmental Impact Assessment, Environmental Risk Assessment, Environmental Contamination Rehabilitation, Geographic Information Systems, and fundamentals in Statistics. The Honours programme also entailed a research project, which looked at the effectiveness of the community awareness programme conducted by the Asbestos Interest Group (AIG) on the effects of and attitudes towards asbestos contamination in two rural communities, Heuningvlei and Ga-Mopedi respectively, in the Northern Cape Province. The research project formed part of a larger project quantifying the extent of secondary environmental asbestos contamination in South Africa. Robyn obtained her undergraduate degree at the University of Cape Town, and her Honours degree at Rhodes University. Robyn's experience and expertise includes Basic Assessments, Environmental Impact Assessments, Environmental Monitoring, Environmental Management Plans, Water Use Licencing, public participation, GIS and project coordination. Robyn has particularly strong experience in infrastructure projects for various municipal, provincial, and national organisations.

1.4.3 Ms Sage Wansell (Public Participation Support)

Ms Sage Wansell Sage holds a Master of Science degree in Botany and has gained experience in field and laboratory work by researching invasive aquatic species in South Africa during that time. Her research focused on the ecology, spread and management strategies of an invasive wetland species. Apart from invasion biology research, Sage has a BSc Honours degree in Biotechnology. Her biotechnology, botany and microbiology background provide an understanding of environmental management, indigenous biodiversity and water quality. Sage is registered as a Candidate Botanical Natural Scientist: South African Council for Natural Scientific Professionals (SACNASP) and is a member of the Member of the International Association for Impact Assessment South Africa (IAIAsa).

PLEASE FIND THE *CURRICULUM VITAE* ATTACHED AS APPENDIX B

2 PROJECT DESCRIPTION

2.1 PROPOSED ACTIVITY

The applicant Soyuz 1 (Pty) Ltd is proposing the development of a commercial Wind Energy Facility (WEF) and associated infrastructure on a site located approximately 22 km South of Britstown within the Emthanjeni Local Municipality and the Pixley ka Seme District Municipality in the Northern Cape Province.

Five additional WEF's are concurrently being considered on the surrounding properties and are assessed by way of separate impact assessment processes contained in the 2014 Environmental Impact Assessment Regulations (GN No. R982, as amended) for listed activities contained in Listing Notices 1, 2 and 3 (GN R983, R984 and R985, as amended). These projects are known as Soyuz 2 WEF, Soyuz 3 WEF, Soyuz 4 WEF, Soyuz 5 WEF and Soyuz 6 WEF.

A preferred project site with an extent of approximately 125 000 ha has been identified as a technically suitable area for the development of the six WEF projects. It is proposed that each WEF will comprise up to 75 turbines with a contracted capacity of up to 480 MW. It is anticipated that each WEF will have an actual (permanent) footprint of up to 150 ha.

The Soyuz 1 WEF project site covers approximately 16 200 ha and comprises the following farm portions:

- Remaining Extent (Portion 0) of the Farm Perdepoort No. 169;
- Portion 1 of the Farm Perdepoort No. 169;
- Portion 11 (a portion of portion 2) of the Farm Nieuwejaarsfontein No. 147;
- Portion 9 (a portion of portion 1) of the Farm Nieuwejaarsfontein No. 147;
- Portion 1 of Farm Nieuwejaarsfontein No. 147;
- Remaining Extent (Portion 0) of Farm No. 145; and
- Portion 0 of Farm 144.

The Soyuz 1 WEF project site is proposed to accommodate the following infrastructure, which will enable the WEF to supply a contracted capacity of up to 480 MW:

- Up to 75 wind turbines with a maximum hub height of up to 160 m and a rotor diameter of up to 200 m;
- A transformer at the base of each turbine;
- Concrete turbine foundations of up to 1024 m^2 each;
- Permanent Crane hardstand / blade and tower laydown area / crane boom erection area with a combined maximum footprint 5000 m^2 at each WTG;
- Temporary concrete batch plants to be located at the construction camp area and the satellite laydown areas;
- Battery Energy Storage System (with a footprint of up to 5 ha);
- Internal up to 132 kV overhead lines between substations. A 300m wide corridor (150m on either side of the proposed route) has been considered to allow for any technical and environmental sensitivity constraints identified during micro-siting prior to layout finalisation. Permanent service roads will be required for the construction and maintenance of the overhead lines. In areas where these overhead lines do not follow an existing or proposed road, additional roads of up to 3m in width will be required. Temporary construction areas beneath each overhead line tower position will also be required;

- Medium voltage (33 kV) cables/powerlines running from wind turbines to the facility substations. The routing will follow existing/proposed access roads and will be buried where possible. If the use of overhead lines is required, the Avifaunal Specialist will be consulted timeously to ensure that a raptor friendly pole design are used, and that appropriate mitigation is implemented pro-actively.
- Up to six permanent met masts;
- Three substations and operation and maintenance facilities (up to 4 ha each) as well as a laydown area (8 000 m^2) at each substation for the electrical contractor. Operation and maintenance facilities include a gate house, security building, control centre, offices, warehouses and workshops.
- Three temporary main construction camp areas (up to 12.25 ha each);
- Twelve temporary satellite laydown areas (5 000 m^2 each).
- Access roads to the site and between project components inclusive of stormwater infrastructure. A 200 m road corridor is being applied for to allow for slight realignments pending technical and environmental sensitivity constraints identified during micro-siting prior to layout finalisation. The final road will have maximum width of 12 m (within the 200 m corridor).

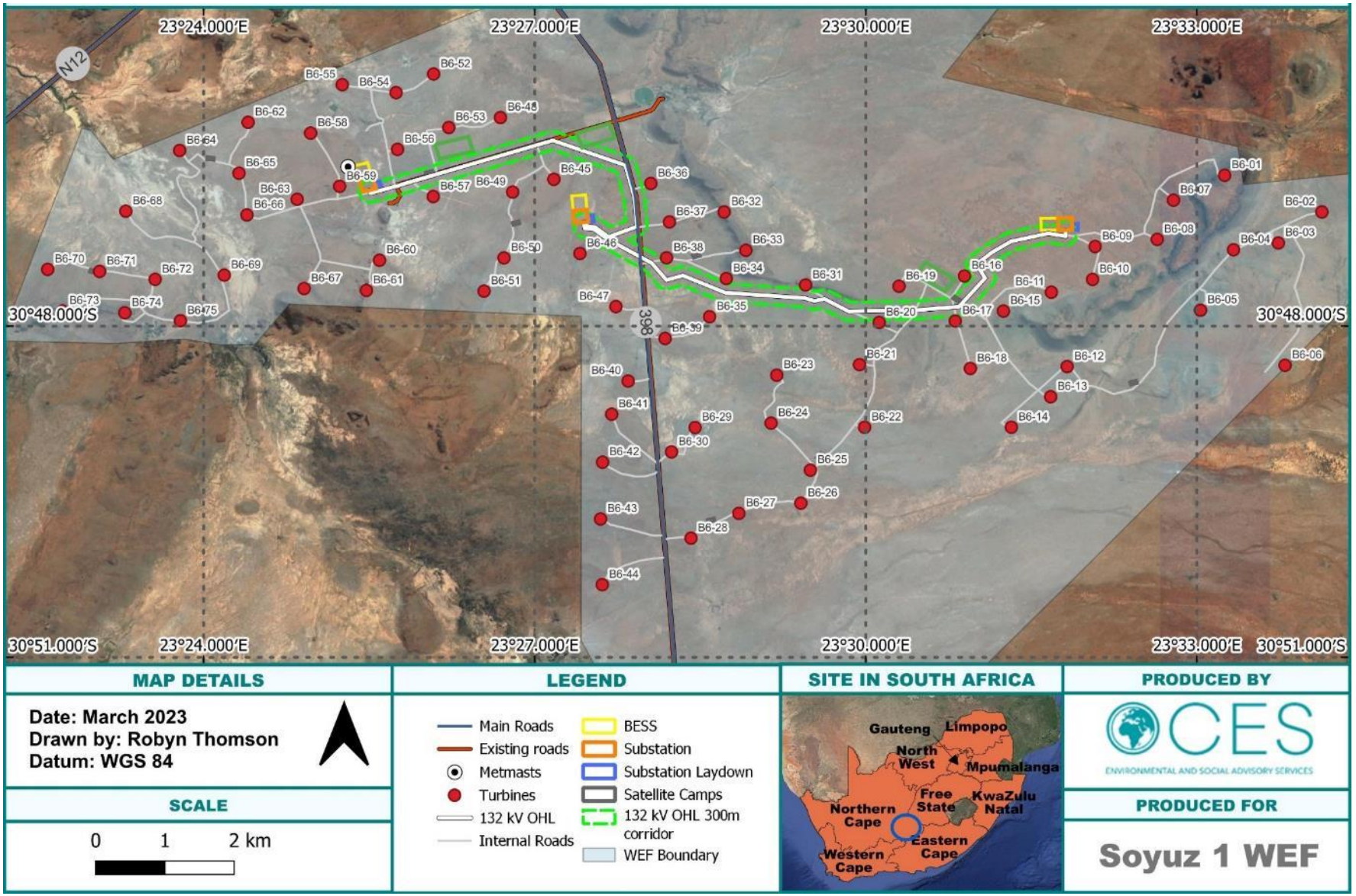


Figure 2-1: Soyuz 1 WEF Layout Map.

The preliminary footprint of the facility is shown in Table 2-1 below. The footprint extent may change slightly during this EIR phase and will be refined based on the results of the detailed specialist studies.

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

FACILITY COMPONENT	CONSTRUCTION FOOTPRINT	FINAL FOOTPRINT AFTER REHABILITATION
Turbine Foundations	TOTAL Up to 1024 m^2 x 75 turbines = 76 800 m^2 which equates to **7.68 ha**	TOTAL Up to 1024 m^2 x 75 turbines = 76 800 m^2 which equates to **7.68 ha**
Turbine, Crane and Blade Hardstands	TOTAL Up to 5000 m^2 x 75 turbines = 375 000 m^2 which equates to **37.5 ha**	TOTAL Up to 5000 m^2 x 75 turbines = 375 000 m^2 which equates to **37.5 ha**
Main Construction Camp Areas	TOTAL Up to 122 500 m^2 x 3 = 367 500 m^2 which equates to **36.75 ha**	None
Satellite Laydown Areas	TOTAL Up to 5000 m^2 x 12 = 60 000 m^2 which equates to **6 ha**	None
Internal and Access Roads	Access roads to the site and between project components inclusive of stormwater infrastructure will be up to 12m in width. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well as for the construction of the bell mouth road junction, turning circles and temporary passing lanes. New Roads required: Up to 75 km. Existing Roads which may need to be upgraded (inclusive of access roads): Up to 20 km.	Permanent roads will be up to 12 m wide inclusive of stormwater infrastructure and underground cabling. Roads will be wider where bell mouth junctions and turning circles are required. The WEF will have a total road network (inclusive of access roads) of about 95 km.
WEF Substations	Substations – Up to 6 ha	Substations – Up to 6 ha
Substation Laydown Areas	Substation laydown areas for the electrical contractor up to 2.4 ha	None
BESS	Up to 5 ha	Up to 5 ha
Operational & Maintenance Buildings	Includes Control Centre, Offices, Warehouses, Workshop, Canteen, Staff Lockers, Gate House and Security etc. with a footprint of up to 6 ha	Includes Control Centre, Offices, Warehouses, Workshop, Canteen, Staff Lockers, Gate House and Security etc. with a footprint of up to 6 ha
Concrete Batching Plants	Concrete batch plants to be located at the construction camp area and the satellite laydown areas.	None
Overhead Powerline	OHL length of approximately 14.5 km. Servitude width of up to 31 m. Pylon spacing between 100m - 300m.	OHL length of approximately 14.5 km. Servitude width of up to 31 m. Pylon spacing between 100m - 300m.
TOTAL FOOTPRINT:	**Up to 215 ha** ***of clearing needed for the construction phase of the development of the proposed Soyuz 1 WEF***	**Up to 150 ha** ***of clearing remaining during the post-construction operational phase (after rehabilitation) of the proposed Soyuz 1 WEF***

2.2 PROJECT LOCALITY

The project area is potentially up to 16 200 hectares (ha) in extent, with a total development footprint of up to 215 ha (pre-rehabilitation) and up to 150 ha (post-rehabilitation) depending on the final layout design. It is located in the Emthanjeni LM and it is situated approximately 22 km south of Britstown. The N12 and R398 roads connect the WEF to Britstown directly to the North and Richmond to the Southeast, respectively. The direction and distance from the project area the nearest towns are indicated in Table 2-2 below:

Table 2-2: Towns in the vicinity of the Soyuz 1 WEF.

TOWN NAME	APPROXIMATE DISTANCE	DIRECTION
Britstown	22 km	South
Victoria West	80 km	Northeast
De Aar	60 km	West
Richmond	85 km	Northeast
Vosburg	85 km	East

Table 2-3 indicates the property portions and farm names associated with the Soyuz 1 WEF project area. The proposed project is situated on approximately 16 200 ha, consisting of eight (8) farm portions.

Table 2-3: Soyuz 1 WEF Properties.

SOYUZ 1 WEF		
SG DIGIT NUMBER	FARM NUMBER/PORTION	AREA (HA)
N073C01200000000144000000	0/144	979
N073C01200000000145000001	RE/145	807
N073C01200000000147000010	1/147	255
N073C01200000000147000060	6/147	1 629
N073C01200000000147000090	9/147	926
N073C01200000000147000110	11/147	3 647
N073C01200000000169000010	1/169	4 893
N073C01200000000169000001	RE/169	3 107
	TOTAL	16243

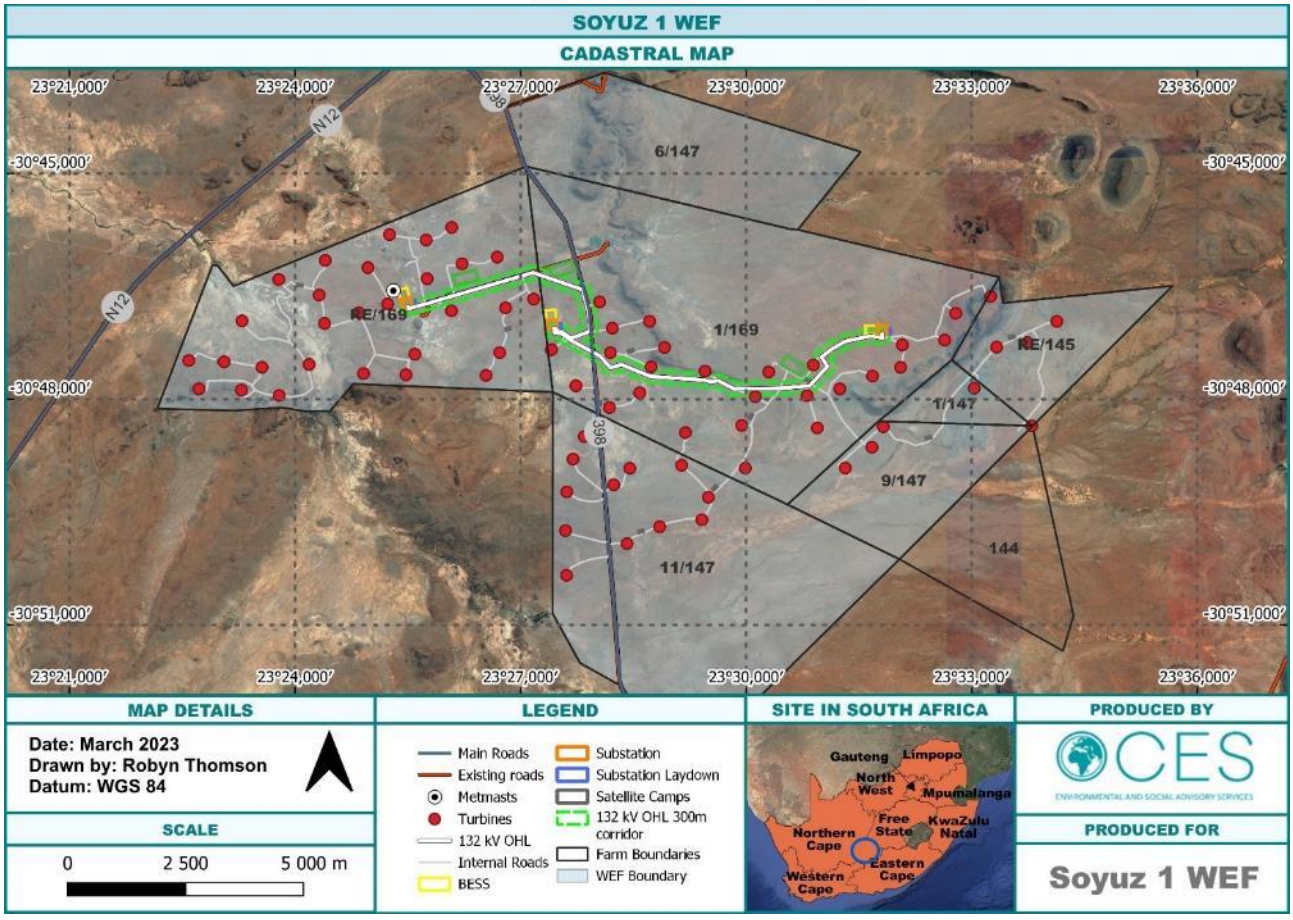


Figure 2-2: Cadastral Map of the Affected Properties within the Proposed Site.

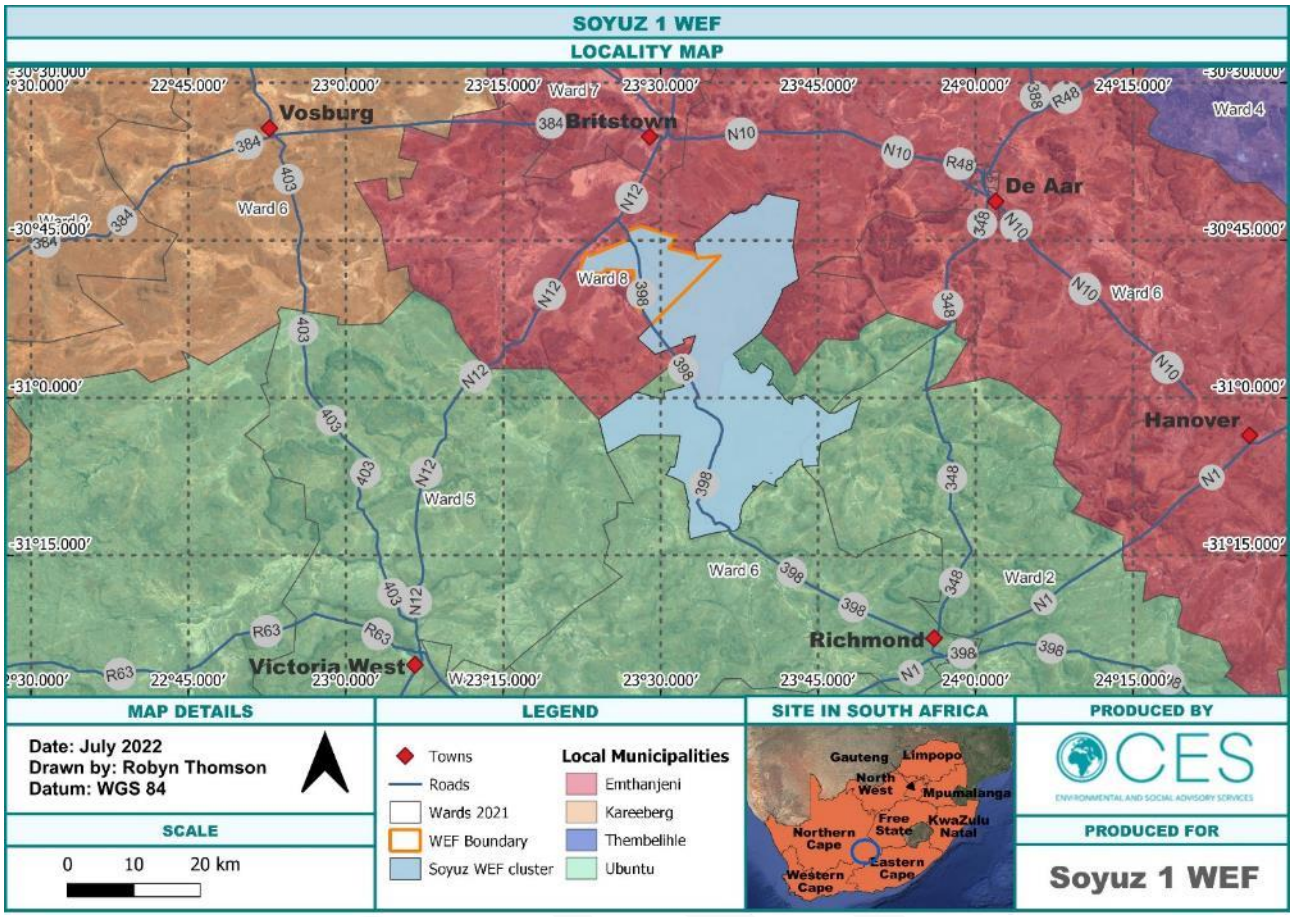


Figure 2-3: Locality Map of the Proposed Soyuz 1 WEF Site.

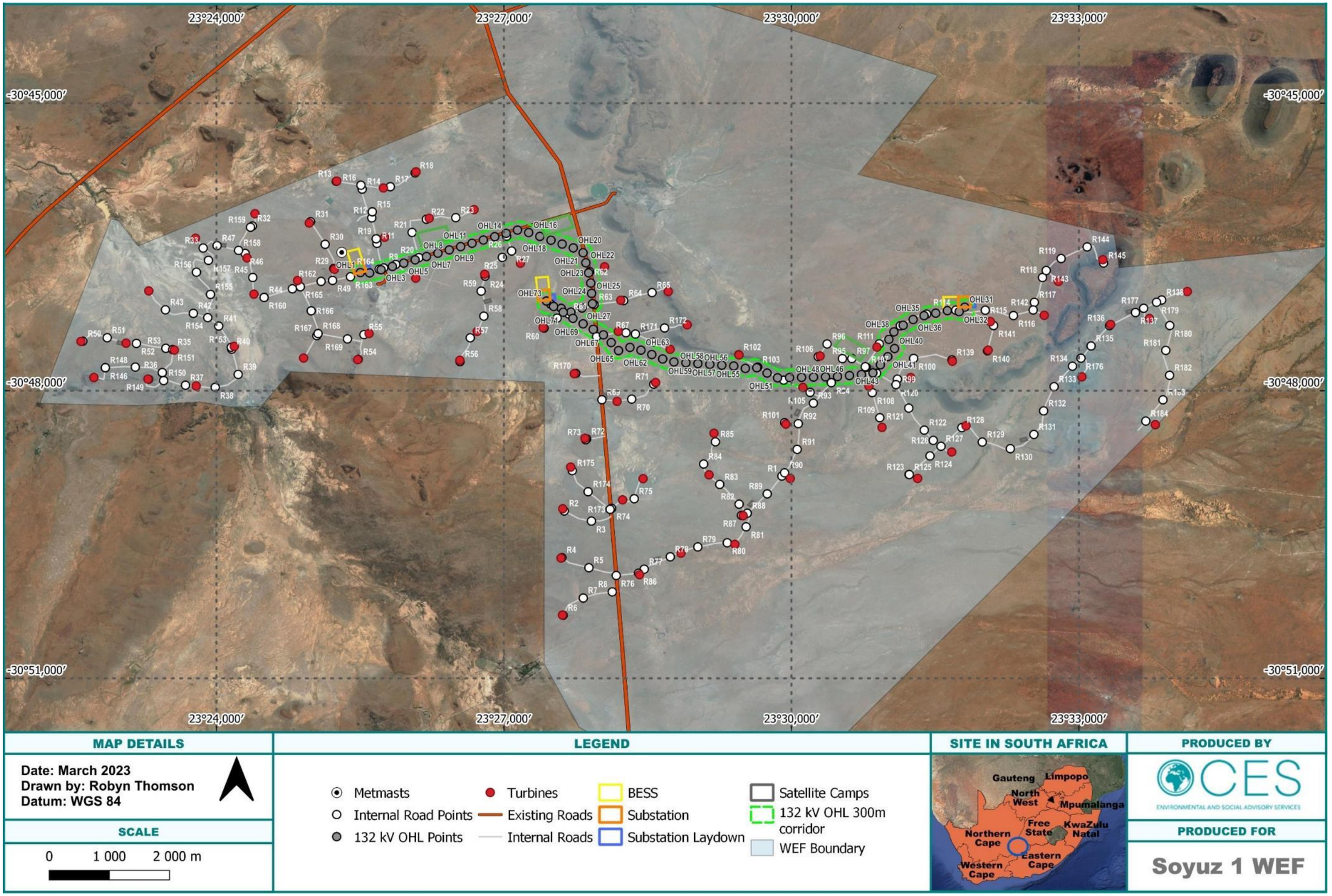


Figure 2-4: Map showing coordinates of the Proposed Soyuz 1 WEF Site.

Table 2-4: List of road coordinates.

SOYUZ 1 WEF ROAD POINTS		
NAME	LATITUDE	LONGITUDE
R1	30°48'53"S	23°29'54"E
R2	30°49'15"S	23°27'38"E
R3	30°49'22"S	23°27'55"E
R4	30°49'45"S	23°27'36"E
R5	30°49'51"S	23°27'53"E
R6	30°50'21"S	23°27'37"E
R7	30°50'10"S	23°27'50"E
R8	30°50'6"S	23°28'8"E
R9	30°46'41"S	23°25'52"E
R10	30°46'43"S	23°25'45"E
R11	30°46'28"S	23°25'41"E
R12	30°46'12"S	23°25'37"E
R13	30°45'49"S	23°25'15"E
R14	30°45'54"S	23°25'31"E
R15	30°46'8"S	23°25'38"E
R16	30°45'51"S	23°25'30"E
R17	30°45'52"S	23°25'49"E
R18	30°45'44"S	23°26'4"E
R19	30°46'25"S	23°25'40"E
R20	30°46'37"S	23°26'7"E
R21	30°46'21"S	23°26'2"E
R22	30°46'13"S	23°26'11"E
R23	30°46'12"S	23°26'30"E
R24	30°46'48"S	23°26'48"E
R25	30°46'37"S	23°26'59"E
R26	30°46'23"S	23°27'2"E
R27	30°46'33"S	23°27'5"E
R29	30°46'44"S	23°25'13"E
R30	30°46'28"S	23°25'8"E
R31	30°46'14"S	23°24'59"E
R32	30°46'17"S	23°24'23"E
R33	30°46'31"S	23°23'52"E
R35	30°47'34"S	23°23'33"E
R36	30°47'49"S	23°23'26"E
R37	30°47'57"S	23°23'41"E
R38	30°47'58"S	23°23'59"E
R39	30°47'50"S	23°24'14"E
R40	30°47'34"S	23°24'10"E
R41	30°47'20"S	23°24'1"E
R42	30°47'12"S	23°23'46"E
R43	30°47'9"S	23°23'28"E
R44	30°47'2"S	23°24'30"E
R45	30°46'49"S	23°24'23"E
R46	30°46'34"S	23°24'18"E
R47	30°46'29"S	23°24'0"E
R48	30°46'55"S	23°24'52"E
R49	30°46'51"S	23°25'13"E

SOYUZ 1 WEF ROAD POINTS		
NAME	LATITUDE	LONGITUDE
R50	30°47'29"S	23°22'36"E
R51	30°47'27"S	23°22'52"E
R52	30°47'30"S	23°23'10"E
R53	30°47'33"S	23°23'28"E
R54	30°47'40"S	23°25'29"E
R55	30°47'25"S	23°25'32"E
R56	30°47'42"S	23°26'33"E
R57	30°47'27"S	23°26'39"E
R58	30°47'13"S	23°26'47"E
R59	30°46'58"S	23°26'46"E
R60	30°47'21"S	23°27'25"E
R61	30°47'12"S	23°27'41"E
R62	30°46'46"S	23°27'54"E
R63	30°47'6"S	23°27'56"E
R64	30°47'4"S	23°28'15"E
R65	30°46'59"S	23°28'33"E
R66	30°47'26"S	23°27'58"E
R67	30°47'24"S	23°28'16"E
R68	30°47'30"S	23°28'34"E
R69	30°48'6"S	23°28'1"E
R70	30°48'5"S	23°28'20"E
R71	30°47'56"S	23°28'34"E
R72	30°48'30"S	23°27'52"E
R73	30°48'31"S	23°27'51"E
R74	30°49'14"S	23°28'7"E
R75	30°49'8"S	23°28'22"E
R76	30°49'56"S	23°28'10"E
R77	30°49'52"S	23°28'28"E
R78	30°49'44"S	23°28'44"E
R79	30°49'38"S	23°29'1"E
R80	30°49'35"S	23°29'20"E
R81	30°49'25"S	23°29'32"E
R82	30°49'11"S	23°29'27"E
R83	30°48'59"S	23°29'15"E
R84	30°48'46"S	23°29'5"E
R85	30°48'32"S	23°29'12"E
R86	30°49'54"S	23°28'24"E
R87	30°49'18"S	23°29'29"E
R88	30°49'17"S	23°29'32"E
R89	30°49'5"S	23°29'45"E
R90	30°48'51"S	23°29'56"E
R91	30°48'37"S	23°30'4"E
R92	30°48'21"S	23°30'4"E
R93	30°48'8"S	23°30'14"E
R94	30°47'55"S	23°30'25"E
R95	30°47'40"S	23°30'32"E
R96	30°47'31"S	23°30'22"E

SOYUZ 1 WEF ROAD POINTS		
NAME	LATITUDE	LONGITUDE
R97	30°47'40"S	23°30'38"E
R98	30°47'49"S	23°30'53"E
R99	30°47'53"S	23°31'6"E
R100	30°47'40"S	23°31'17"E
R101	30°48'20"S	23°29'56"E
R102	30°47'38"S	23°29'27"E
R103	30°47'45"S	23°29'39"E
R104	30°47'53"S	23°29'55"E
R105	30°48'1"S	23°30'12"E
R106	30°47'39"S	23°30'17"E
R107	30°47'45"S	23°30'47"E
R108	30°48'1"S	23°30'51"E
R109	30°48'17"S	23°30'55"E
R110	30°47'45"S	23°30'46"E
R111	30°47'31"S	23°30'55"E
R112	30°47'19"S	23°31'8"E
R113	30°47'12"S	23°31'25"E
R114	30°47'10"S	23°31'43"E
R115	30°47'10"S	23°32'1"E
R116	30°47'13"S	23°32'19"E
R117	30°47'5"S	23°32'32"E
R118	30°46'49"S	23°32'37"E
R119	30°46'37"S	23°32'49"E
R120	30°47'56"S	23°31'6"E
R121	30°48'11"S	23°31'14"E
R122	30°48'25"S	23°31'23"E
R123	30°48'52"S	23°31'14"E
R124	30°48'41"S	23°31'27"E
R125	30°48'53"S	23°31'14"E
R126	30°48'31"S	23°31'29"E
R127	30°48'35"S	23°31'34"E
R128	30°48'23"S	23°31'47"E
R129	30°48'32"S	23°32'0"E
R130	30°48'36"S	23°32'17"E
R131	30°48'27"S	23°32'32"E
R132	30°48'13"S	23°32'38"E
R133	30°47'58"S	23°32'45"E
R134	30°47'45"S	23°32'56"E
R135	30°47'32"S	23°33'8"E
R136	30°47'19"S	23°33'19"E
R137	30°47'11"S	23°33'36"E
R138	30°47'3"S	23°33'52"E
R139	30°47'41"S	23°31'41"E
R140	30°47'35"S	23°32'3"E

SOYUZ 1 WEF ROAD POINTS		
NAME	LATITUDE	LONGITUDE
R141	30°47'19"S	23°32'7"E
R142	30°47'10"S	23°32'31"E
R143	30°46'45"S	23°32'40"E
R144	30°46'30"S	23°33'5"E
R145	30°46'40"S	23°33'16"E
R146	30°47'46"S	23°22'50"E
R147	30°47'45"S	23°23'9"E
R148	30°47'46"S	23°22'50"E
R149	30°47'53"S	23°23'17"E
R150	30°47'54"S	23°23'27"E
R151	30°47'34"S	23°23'33"E
R152	30°47'49"S	23°23'26"E
R153	30°47'33"S	23°24'9"E
R154	30°47'14"S	23°23'55"E
R155	30°47'0"S	23°23'56"E
R156	30°46'46"S	23°23'47"E
R157	30°46'38"S	23°23'55"E
R158	30°46'32"S	23°24'14"E
R159	30°46'18"S	23°24'21"E
R160	30°47'2"S	23°24'30"E
R161	30°46'56"S	23°24'48"E
R162	30°46'52"S	23°25'6"E
R163	30°46'49"S	23°25'24"E
R164	30°46'44"S	23°25'42"E
R165	30°46'55"S	23°24'53"E
R166	30°47'10"S	23°24'59"E
R167	30°47'26"S	23°25'3"E
R168	30°47'24"S	23°25'4"E
R169	30°47'28"S	23°25'22"E
R170	30°47'49"S	23°27'45"E
R171	30°47'25"S	23°28'22"E
R172	30°47'21"S	23°28'41"E
R173	30°49'14"S	23°28'6"E
R174	30°49'3"S	23°27'53"E
R175	30°48'50"S	23°27'43"E
R176	30°47'40"S	23°33'1"E
R177	30°47'8"S	23°33'41"E
R178	30°47'15"S	23°27'33"E
R179	30°47'5"S	23°33'49"E
R180	30°47'19"S	23°33'57"E
R181	30°47'35"S	23°33'54"E
R182	30°47'50"S	23°33'57"E
R183	30°48'6"S	23°33'53"E
R184	30°48'19"S	23°33'42"E

Table 2-5: List of OHL coordinates.

SOYUZ 1 WEF OHL POINTS		
NAME	LATITUDE	LONGITUDE
OHL1	30°46'46"S	23°25'30"E
OHL2	30°46'46"S	23°25'36"E
OHL3	30°46'44"S	23°25'43"E
OHL4	30°46'42"S	23°25'50"E
OHL5	30°46'40"S	23°25'57"E
OHL6	30°46'38"S	23°26'4"E
OHL7	30°46'36"S	23°26'12"E
OHL8	30°46'34"S	23°26'19"E
OHL9	30°46'32"S	23°26'26"E
OHL10	30°46'30"S	23°26'33"E
OHL11	30°46'28"S	23°26'40"E
OHL12	30°46'26"S	23°26'47"E
OHL13	30°46'24"S	23°26'54"E
OHL14	30°46'22"S	23°27'1"E
OHL15	30°46'19"S	23°27'9"E
OHL16	30°46'21"S	23°27'16"E
OHL17	30°46'23"S	23°27'22"E
OHL18	30°46'26"S	23°27'29"E
OHL19	30°46'28"S	23°27'36"E
OHL20	30°46'31"S	23°27'43"E
OHL21	30°46'34"S	23°27'50"E
OHL22	30°46'40"S	23°27'51"E
OHL23	30°46'46"S	23°27'53"E
OHL24	30°46'53"S	23°27'54"E
OHL25	30°46'59"S	23°27'55"E
OHL26	30°47'6"S	23°27'55"E
OHL27	30°47'8"S	23°27'49"E
OHL28	30°47'11"S	23°27'42"E
OHL29	30°47'8"S	23°27'36"E
OHL30	30°47'6"S	23°27'29"E
OHL31	30°47'8"S	23°31'49"E
OHL32	30°47'11"S	23°31'45"E
OHL33	30°47'10"S	23°31'38"E
OHL34	30°47'11"S	23°31'30"E
OHL35	30°47'13"S	23°31'23"E
OHL36	30°47'15"S	23°31'16"E
OHL37	30°47'19"S	23°31'10"E

SOYUZ 1 WEF OHL POINTS		
NAME	LATITUDE	LONGITUDE
OHL38	30°47'23"S	23°31'4"E
OHL39	30°47'28"S	23°31'1"E
OHL40	30°47'34"S	23°31'5"E
OHL41	30°47'39"S	23°31'0"E
OHL42	30°47'44"S	23°30'56"E
OHL43	30°47'49"S	23°30'51"E
OHL44	30°47'50"S	23°30'44"E
OHL45	30°47'51"S	23°30'36"E
OHL46	30°47'51"S	23°30'29"E
OHL47	30°47'51"S	23°30'21"E
OHL48	30°47'52"S	23°30'14"E
OHL49	30°47'52"S	23°30'6"E
OHL50	30°47'52"S	23°29'59"E
OHL51	30°47'52"S	23°29'51"E
OHL52	30°47'49"S	23°29'45"E
OHL53	30°47'46"S	23°29'38"E
OHL54	30°47'46"S	23°29'31"E
OHL55	30°47'45"S	23°29'24"E
OHL56	30°47'44"S	23°29'16"E
OHL57	30°47'44"S	23°29'9"E
OHL58	30°47'43"S	23°29'1"E
OHL59	30°47'43"S	23°28'54"E
OHL60	30°47'42"S	23°28'46"E
OHL61	30°47'40"S	23°28'39"E
OHL62	30°47'37"S	23°28'33"E
OHL63	30°47'35"S	23°28'26"E
OHL64	30°47'33"S	23°28'19"E
OHL65	30°47'35"S	23°28'12"E
OHL66	30°47'30"S	23°28'7"E
OHL67	30°47'25"S	23°28'2"E
OHL68	30°47'22"S	23°27'56"E
OHL69	30°47'18"S	23°27'50"E
OHL70	30°47'15"S	23°27'43"E
OHL71	30°47'11"S	23°27'37"E
OHL72	30°47'7"S	23°27'31"E
OHL73	30°47'4"S	23°27'27"E

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 Soyuz 1 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 2-5 below.

Table 2-6: Listed activities triggered by the proposed Soyuz 1 WEF

LISTING NOTICE		ACTIVITY DESCRIPTION
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.**	The project will require the construction and operation of an on-site 33kV/132kV facility substation to facilitate the connection of the wind farm to the national grid. Medium voltage underground (where possible) electrical cables will be laid to transmit electricity generated by the wind turbines to the onsite facility substations.
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 cabling routes, internal roads, substations, laydown areas, construction compound area, and operation and maintenance buildings which may be constructed within 32m of watercourse.
19	**The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;**	This relates specifically to road and cable crossings that may be required during internal road construction and cable installation connecting the turbines as well as access road installation and upgrading for the WEF.
24	**The development of a road–** **A road with a reserve wider the 13.5 metres, or where no reserve exists where the road is wider than 8 metres.**	The road network will need to be developed and upgraded (using all technically feasible existing 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. A 12 m road corridor will be impacted upon during the construction phase.
28	**Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for**	The total area of land to be developed for the Soyuz 1 wind farm is larger than 1

LISTING NOTICE		ACTIVITY DESCRIPTION
	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.**	hectare and the land is currently used for agriculture. The total footprint of the proposed WEF will be approximately up to 150 ha in extent (post-construction rehabilitation).
48	**The expansion of-** **(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; where such expansion occurs—** **(a) within a watercourse; or** **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse**	The road network will need to be 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.
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. This will include the widening of a road by more than 6m and the lengthening of some roads by more than 1 km.
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	**The development of a road wider than 4 metres with a reserve less than 13,5 metres.** **g. Northern Cape** **Outside urban areas:** **(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;**	The WEF is traversed by an Ecological Support Area as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016). 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. The roads will be wider than 4 meters and will need to cross the Ecological Support Area.
12	**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 is traversed by an Ecological Support Area as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016).

LISTING NOTICE		ACTIVITY DESCRIPTION
14	The development of— **i. infrastructure or structures with a physical footprint of 10 square metres or more;** where such development occurs— **(a) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;** **a. Northern Cape** i. Outside urban areas: **(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;**	This relates to the proposed cabling routes and internal roads which may be constructed within a watercourse. The combined physical footprint at the various water course crossings exceeds 10 square metres. The WEF is traversed by an Ecological Support Area as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016).
18	**The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.** **a. Northern Cape** **i. 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**	Existing roads will need to be widened by more than 4m in certain areas. The WEF is traversed by an Ecological Support Area as defined in the Northern Cape Critical Biodiversity Areas Technical Report (2016) and is within 100m from the edge of a watercourse.
23	**The expansion of –** **(ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs –** **(a) within a watercourse;** **(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;** **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 total area of land to be developed for the Soyuz 1 WEF is larger than 10 square metres on land containing watercourses within a Biodiversity Area (CBA).
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 75 turbines with a maximum output capacity of up to 480MW. This wind energy facility is classified as a renewable energy facility.
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 up to 150ha in extent (post-mitigation).

The Applicant, or the EAP on behalf of the Applicant, is initially required to submit a report detailing the Scoping Phase 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 application relates to the generation of electricity using wind energy, as identified in the Integrated Resources Plan (IRP) 2010 – 2030. Published under GNR 779 of 01 July 2016, the Minister of Environmental Affairs has, in terms of section 24C(1), 24C(2)(a)(i) and 24D of the NEMA, identified the Minister as the competent authority in respect of any activities pertaining to the IRP 2010–2030 that require an environmental authorisation in terms of the NEMA. Therefore, the competent authority for this project is the National Department of Forestry, Fisheries and the Environment (DFFE).

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 Soyuz 1 WEF will consist of up to 75 wind turbines, for a total combined maximum output capacity of up to 480 MW.

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 2-5 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 can 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 Soyuz 1 WEF turbines is up to 200 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, on which a wind turbine is mounted is not only a support structure, but also raises the wind turbine so that the blades safely clear the ground and reach the stronger winds at higher elevations. The tower must also be strong enough to support the wind turbine

and to sustain vibration, wind loading, and the overall weather elements for the lifetime of the turbine. The maximum hub height of the Soyuz 1 WEF turbines is up to 160 m.

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

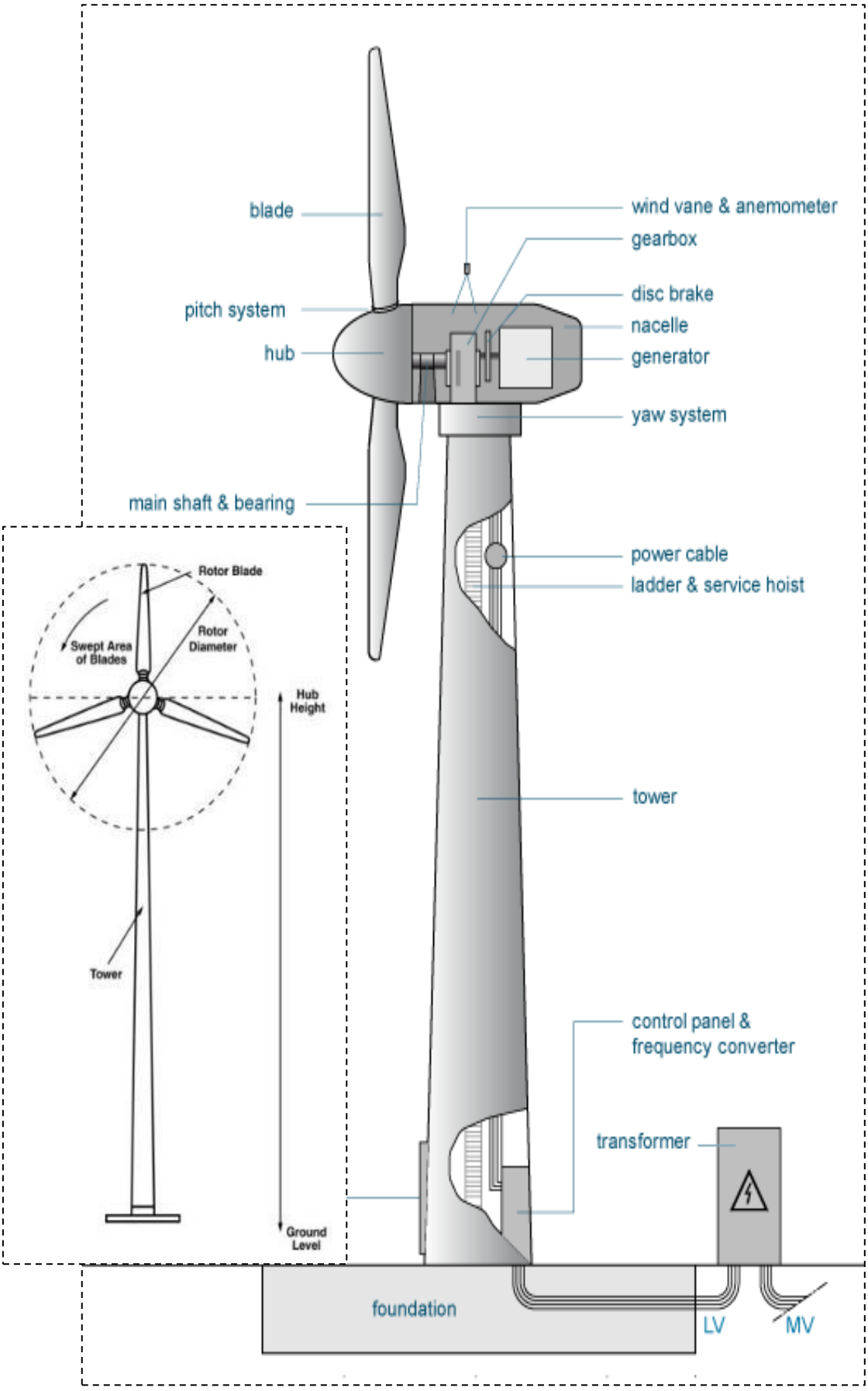


Figure 2-5: Illustrations of the main components of a typical wind turbine. *Note that the transformer would typically be inside the tower (likely at the base). Sources: www.newen.ca and www.soleai.com.

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.

These platforms will be connected by access roads with the following requirements:

- Minimum of 12 m width (9 m running width and 1.5 m verge either side) on straight sections with widening required on corners;
- Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well as for the construction of the bell mouth road junction, turning circles and temporary passing lanes
- Should a "crawler" type crane be used, then road widths of up to 12 m on straight sections may be required, of which 6 m would be retained for the life of the wind farm;
- Typical 300 mm deep road section;
- Maximum 10% vertical gradient on gravel roads;
- Turning heads provided within 200 m of each crane pad; and
- Passing places of c. 50 m length and 5 m width located approximately every 1 km.

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

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.

(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.

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.

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.

The DMRE launched the Request for Proposals (RFP) for the Sixth (6th) Bid Window under the REIPPPP in May 2022.

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 5 200 MW, including 3 200 MW from onshore wind energy and 2 000 MW from Solar Photovoltaic (Solar PV) power plants.

The Sixth (6th) Bid Window, under the REIPPPP, was concluded in December 2022. Eskom listed grid constraints as a limiting factor to certain areas within South Africa and as such no wind energy was awarded preferred bidder status during Round 6.

3.4 SOCIAL AND ECONOMIC DEVELOPMENT

Soyuz 1 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 Soyuz 1 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 SOYUZ 1 WEF

The UNFCCC is relevant in that the proposed Soyuz 1 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 SOYUZ 1 WEF

The Kyoto Protocol is relevant in that the proposed Soyuz 1 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 SOYUZ 1 WEF

The proposed Soyuz 1 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 SOYUZ 1 WEF

The proposed Soyuz 1 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 SOYUZ 1 WEF

The proposed Soyuz 1 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 SOYUZ 1 WEF

The Soyuz 1 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 SOYUZ 1 WEF

The Soyuz 1 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 SOYUZ 1 WEF

The proposed Soyuz 1 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 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.

Table 3-1 below summarises the REIPPPP bidding windows which have already been completed.

Table 3-1: REIPPPP bidding windows

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

The Sixth (6th) Bid Window, under the REIPPPP, was concluded in December 2022. Eskom listed grid constraints as a limiting factor to certain areas within South Africa and as such only five solar projects (no wind energy) were awarded preferred bidder status during Round 6.

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 5 200 MW, including 3 200 MW from onshore wind energy and 2 000 MW from Solar Photovoltaic (Solar PV) power plants.

This 6th Bid Window was designed to contribute towards socio-economic and environmentally sustainable growth, to continue the successes of the REIPPPP since its inception, and to further stimulate increased local participation and economic empowerment in the South African Renewable Energy industry.

Given the energy challenges the country is facing the qualification criteria has been developed to promote the participation of projects that are fully developed and will be able to be constructed and connected to the national grid as soon as possible, but not later than 24 months post Commercial Close.

RELEVANCE TO THE PROPOSED SOYUZ 1 WEF

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

3.6.8 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 SOYUZ 1 WEF

The proposed Soyuz 1 WEF will contribute towards an overall reduction in emissions and aligns with the world stance on efforts towards the mitigation of climate change.

3.6.9 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 SOYUZ 1 WEF

The proposed Soyuz 1 WEF will contribute towards an overall reduction in emissions, and it aligns with the world stance on efforts towards the mitigation of climate change.

3.6.10STRATEGIC 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 SOYUZ 1 WEF

The Soyuz 1 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 SOYUZ 1 WEF

The proposed Soyuz 1 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 480 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 SOYUZ 1 WEF

The proposed Soyuz 1 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 Emthanjeni Local Municipality Integrated Development Plan

The Emthanjeni IDP (2021/2022) states that the municipality is becoming a centre for renewable energy developments, although the sector has not yet had a sustainable impact on projects and job creation. Renewable energy projects, together with Manufacturing and Warehousing, is seen as one of the key investment sectors in the municipality that can contribute to significant economic growth.

RELEVANCE TO THE PROPOSED SOYUZ 1 WEF

The proposed Soyuz 1 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 will be used to finalise the positions of the wind turbines. The masts were marked as per the requirements of the Civil Aviation Authority (CAA).

3.9 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 then 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 Soyuz 1 WEF falls approximately 86 km to the North of the Beaufort West REDZ. The site does however fall within the Central Power Corridor.

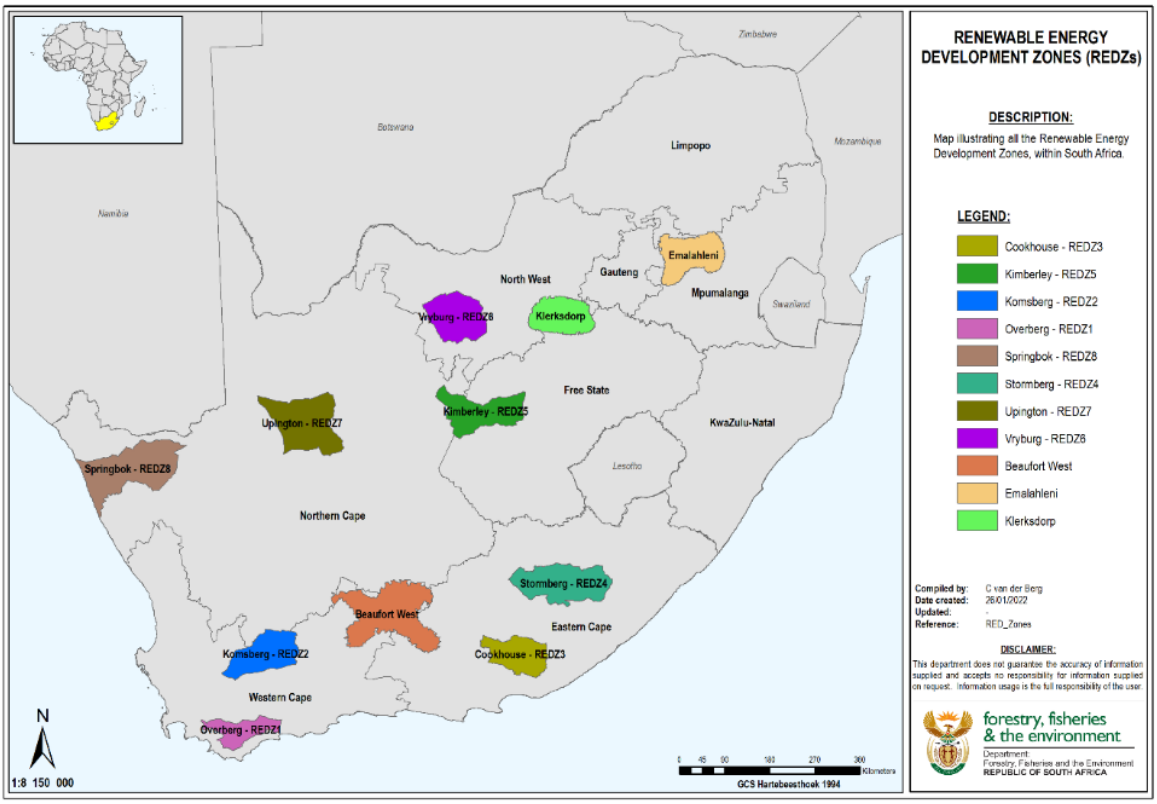


Figure 3-1: DFFE Renewable Energy Development Zones (REDZ).

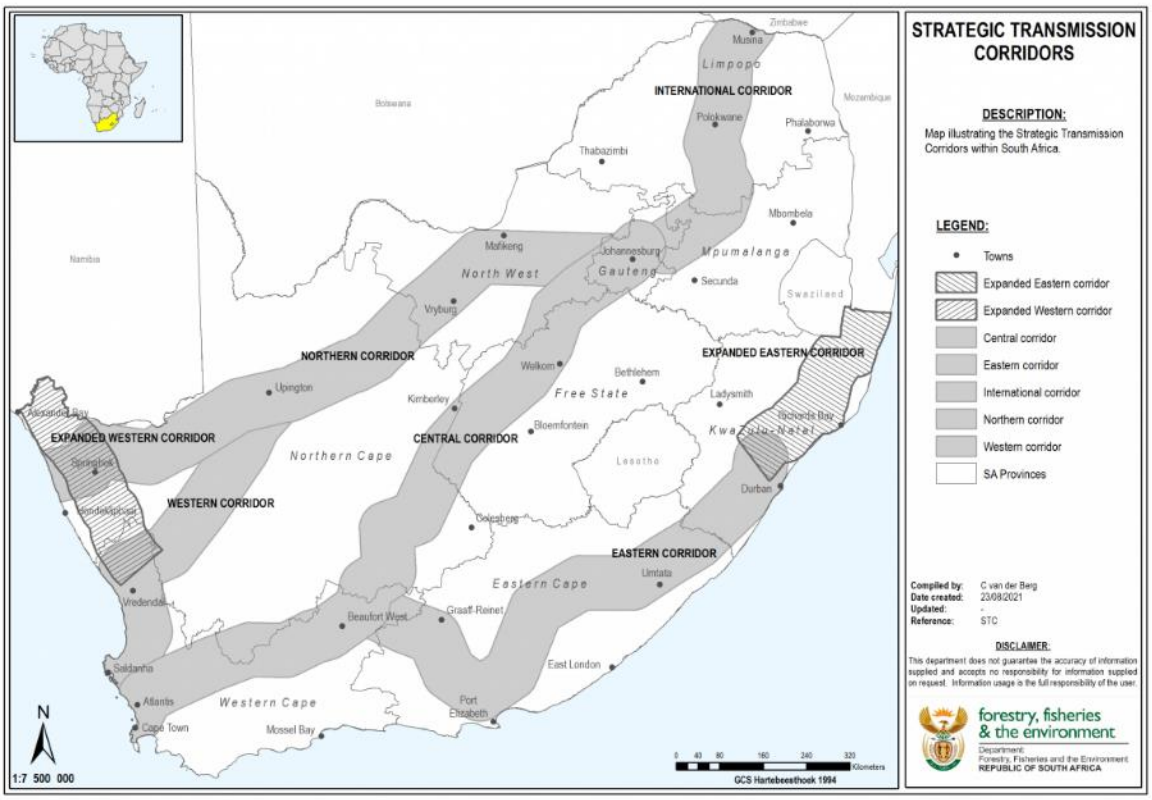


Figure 3-2: DFFE Strategic Transmission Corridors (the site is situated in the central transmission corridor).

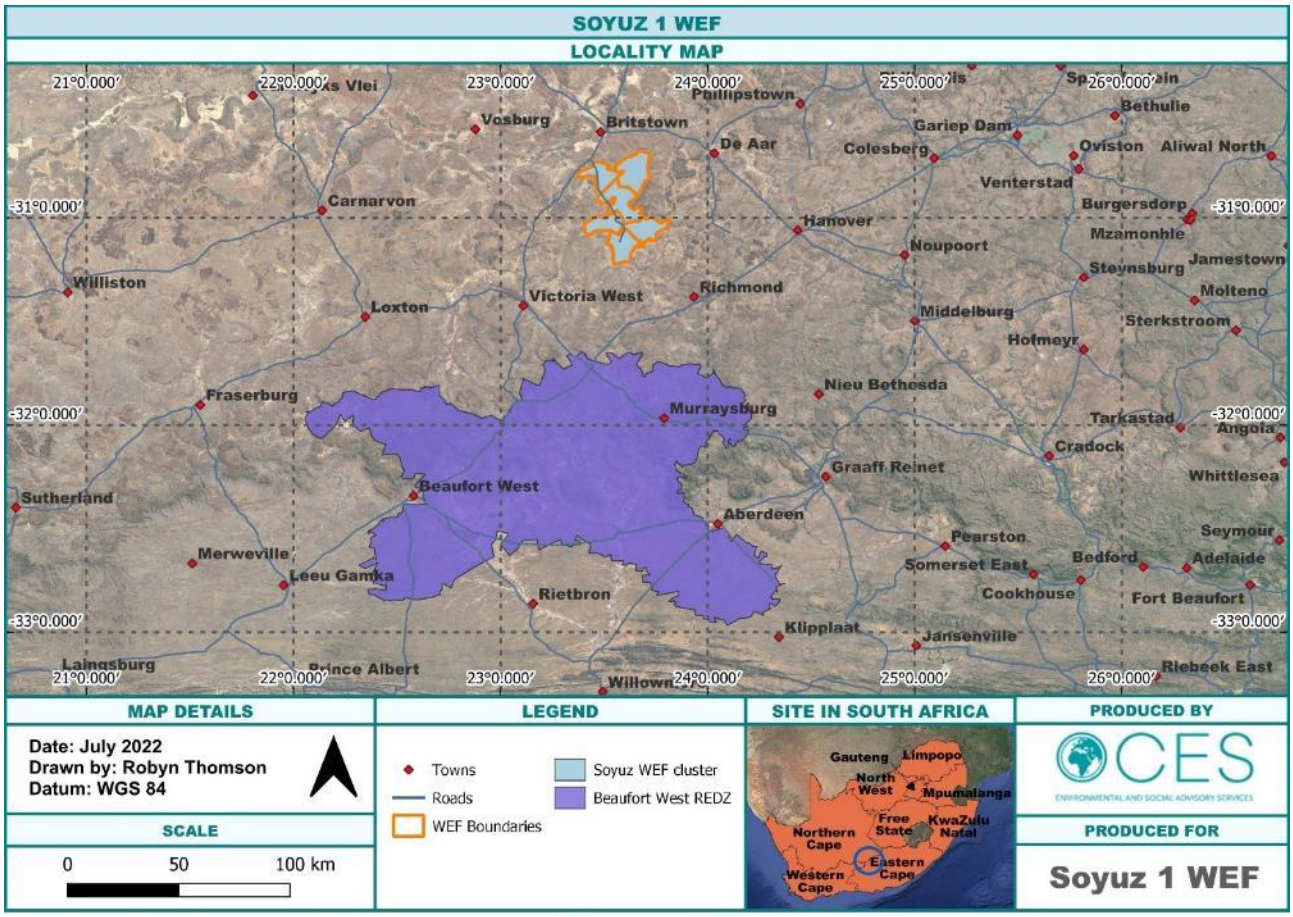


Figure 3-3: Proposed WEF locations in relation to the closest REDZ (Beaufort West).

RELEVANCE TO THE PROPOSED SOYUZ 1 WEF

Although the proposed Soyuz 1 WEF does not occur within a REDZ area, it is situated within the central transmission corridor.

3.10 BIODIVERSITY CONSERVATION PROGRAMMES

The proposed Soyuz 1 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 EIR, according to SANBI's National Vegetation Map (2018), the proposed WEF occurs within two (2) vegetation types, namely Eastern Upper Karoo (least concern) and Upper Karoo Hardeveld (least concern) (Figure 3-4).

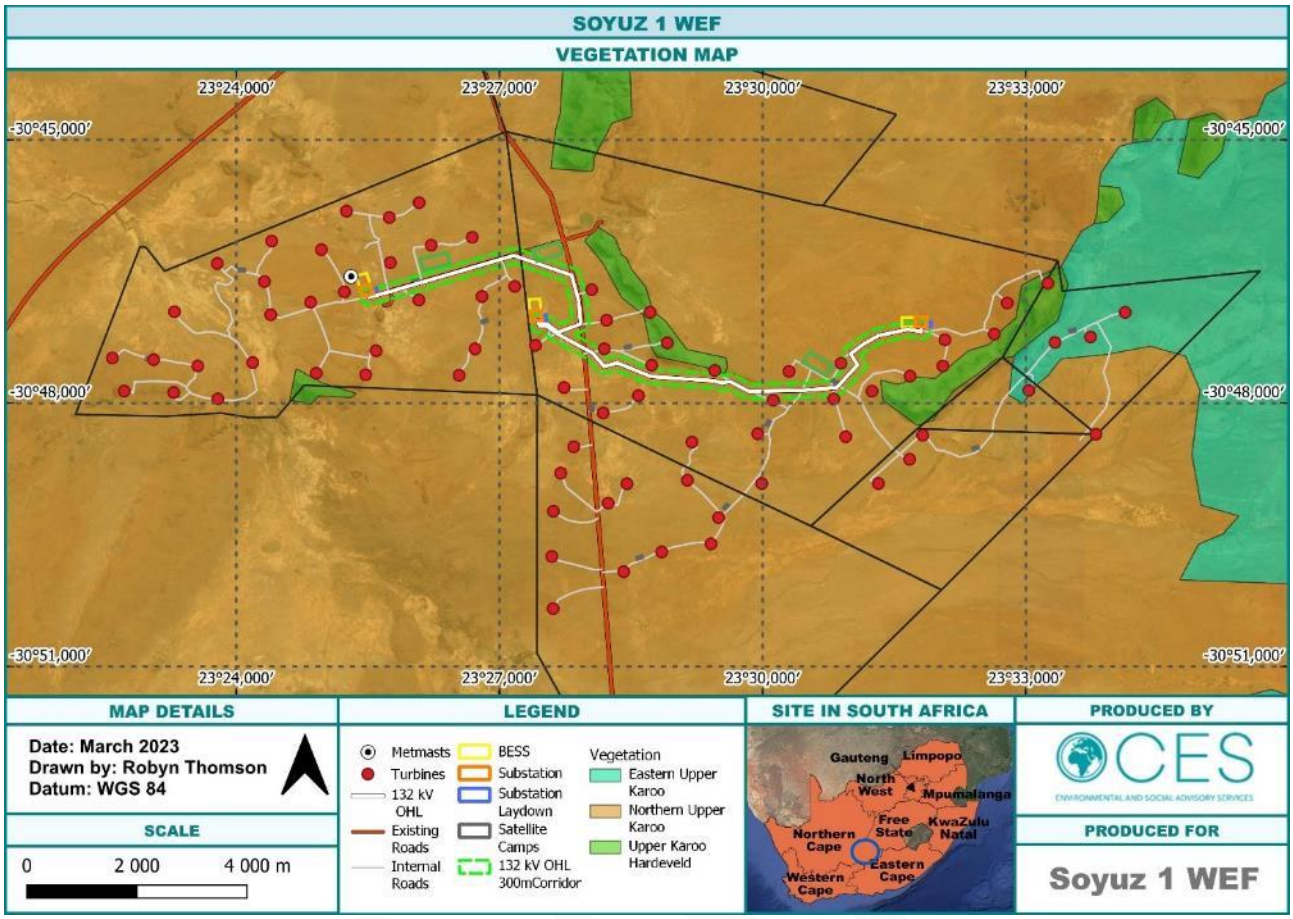


Figure 3-4: National Vegetation Map for the proposed Soyuz 1 WEF site area.

3.10.2 Critical Biodiversity Areas

No CBAs occur on the site; however, an ESA corridor traverses the western section of the WEF. It is likely that development within the ESA cannot be avoided.

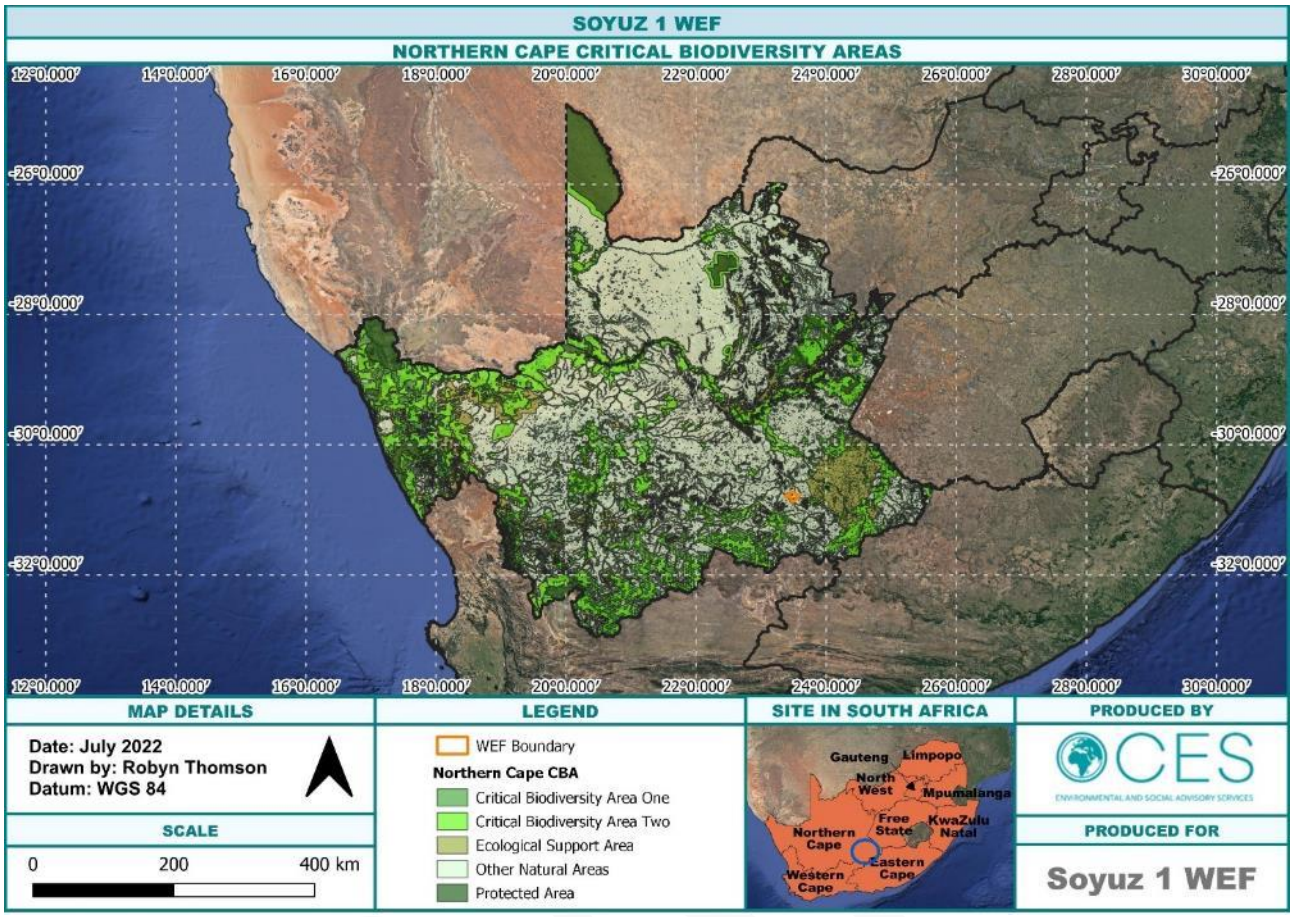


Figure 3-5: Northern Cape Critical Biodiversity Areas.

3.10.3 PROTECTED AREAS

No protected areas are located on the proposed WEF site (Figure 3-6, Figure 3-7, and Figure 3-8). The closest protected area is the National Mountain Zebra/ Camdeboo Environment, located approximately 100 km to the southeast. The Meerkat National Park is located 150 km to the west of the WEF. Several areas surrounding the WEF, approximately 70 km north and east and 100 km south of the WEF, have been identified by the NCPAES as a Primary Focus areas.

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

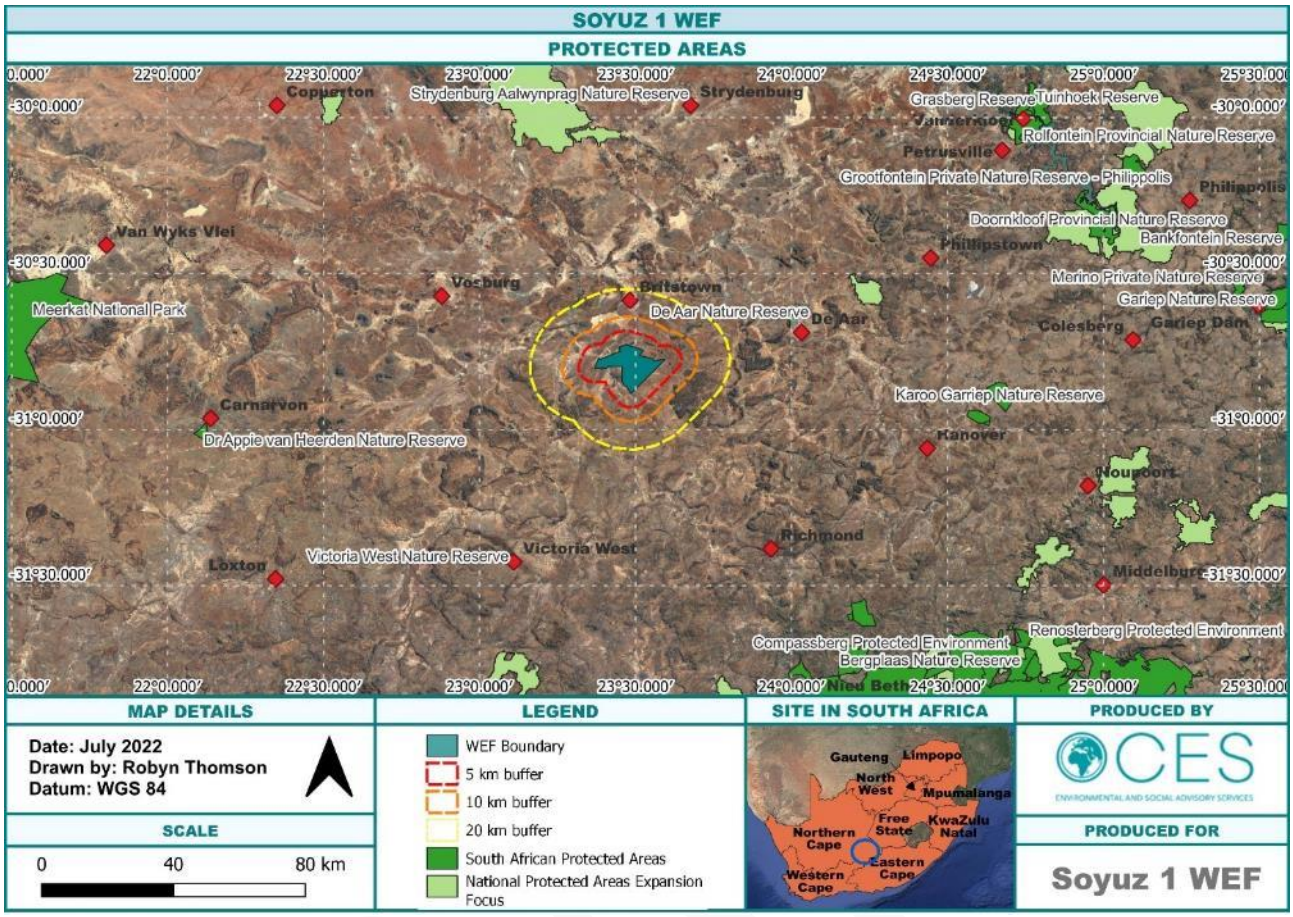


Figure 3-6: Legislated Protected Areas in or around the proposed WEF site.

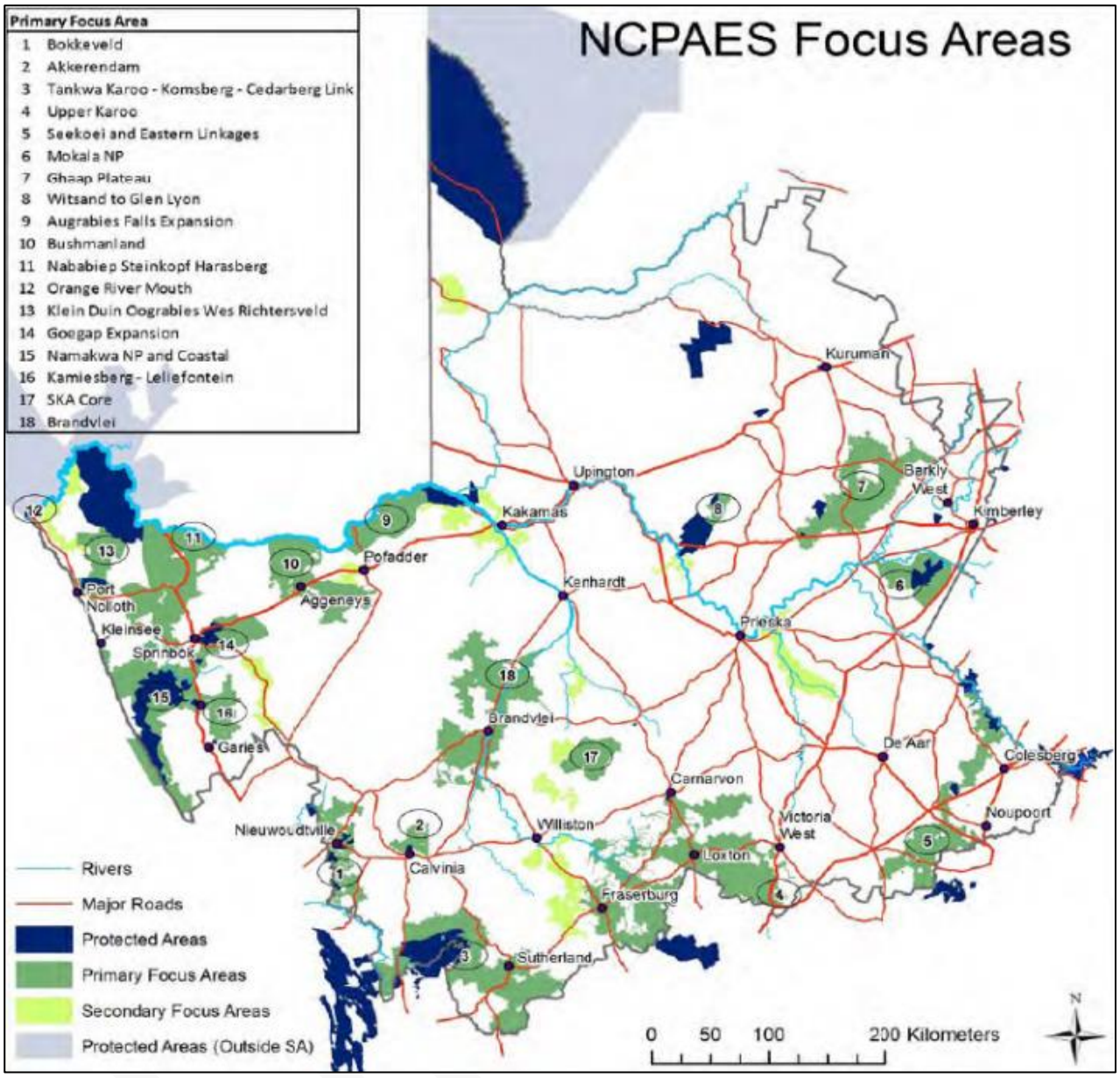


Figure 3-7: NCPAES Focus Areas (Oosthuysen et al. 2017).

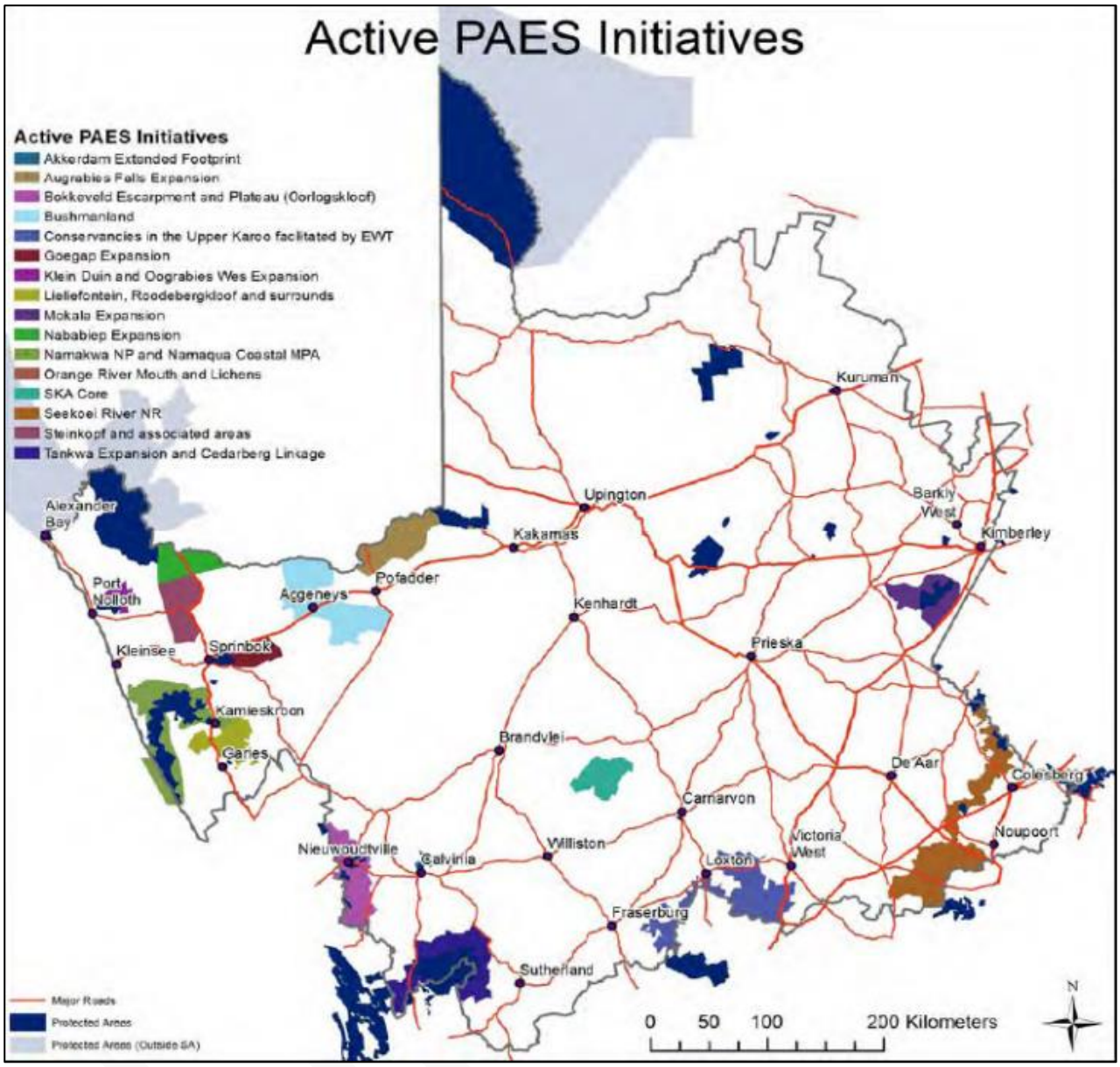


Figure 3-8: Active PAES Initiatives (Oosthuysen et al. 2017).

3.11 CONCLUDING REMARKS

The Northern Cape is the largest Province in South Africa 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 IPPPP).

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. REIPPPP 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 are being thoroughly investigated in the EIR phase (this report) of the EIA process.

4 RELEVANT LEGISLATION

The development of the proposed Soyuz 1 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 SOYUZ 1 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 (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

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;

NEMA ENVIRONMENTAL MANAGEMENT PRINCIPLES	
	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 SOYUZ 1 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 SOYUZ 1 WEF

The Soyuz 1 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 SOYUZ 1 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 SOYUZ 1 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 SOYUZ 1 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 SOYUZ 1 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 SOYUZ 1 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 SOYUZ 1 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 Soyuz 1 WEF. These cover, among other issues, noise and lighting.

RELEVANCE TO THE PROPOSED SOYUZ 1 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 Soyuz 1 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 SOYUZ 1 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.

RELEVANCE TO THE PROPOSED SOYUZ 1 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 SOYUZ 1 WEF

The proposed Soyuz 1 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 SOYUZ 1 WEF

Approval will be required from the DALRRD for any proposed rezoning, long-term lease, 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 Table 4-2below, these categories are linked to the size of the proposed operation and the proposed operational period.

Table 4-2 DMRE mining permitting and licence requirements

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 SOYUZ 1 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 Soyuz 1 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 SOYUZ 1 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 Soyuz 1 WEF development the following requirements of the Act need to be considered:

RELEVANT SECTION OF THE ACT	RELEVANT TO THE PROPOSED SOYUZ 1 WEF:
Section 3: Fire Protection Associations.	The proposed Soyuz 1 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 Soyuz 1 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 Soyuz 1 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 Soyuz 1 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.
- National Energy Regulator of South Africa (NERSA): Generation License.
- Eskom: Connection agreement and Power Purchase Agreement (PPA).
- Emthanjeni Local Municipality Spatial Development Framework (SDF), Integrated Development Plan (IDP) and municipal by-laws.
- Pixley Ka Seme District Municipality SDF and IDP.

5 DESCRIPTION OF THE ENVIRONMENT: BIOPHYSICAL

The following chapter outlines the biophysical features of the property portions on which the proposed Soyuz 1 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 south of Britstown within the Emthanjeni 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 1000-1700 masl.

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.

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.

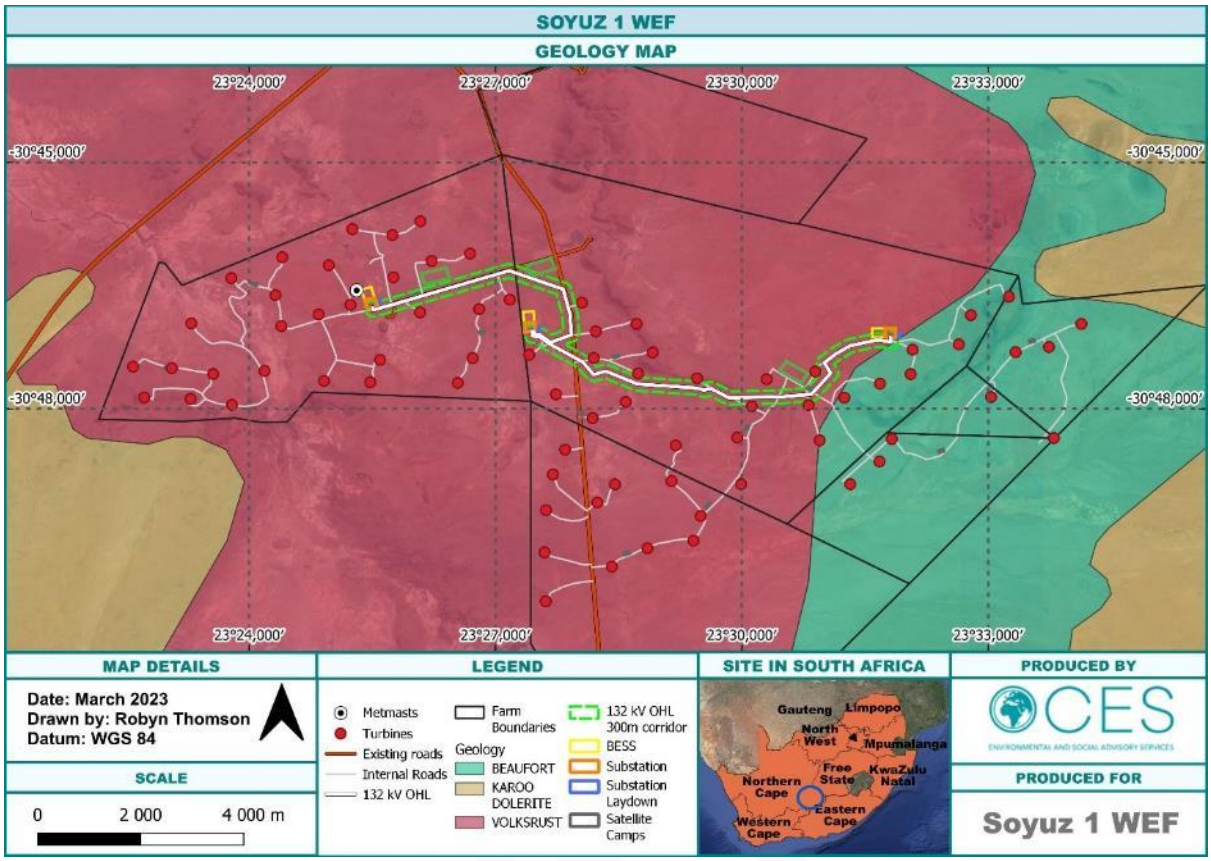


Figure 5-1: Geology Map of the Soyuz 1 WEF site.

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 Britstown 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 Britstown 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: Soyuz 1 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 AGRICULTURAL ENVIRONMENT

5.5.1 SOIL PROPERTIES

The soil profiles classified within the Soyuz 1 WEF project site consist of the Augrabies, Coega, Mispah, Nkonkoni, Prieska, Swartland and Glenrosa soil form. The positions of the soil form are depicted in Figure 5-2 and a description of each soil form is provided below.

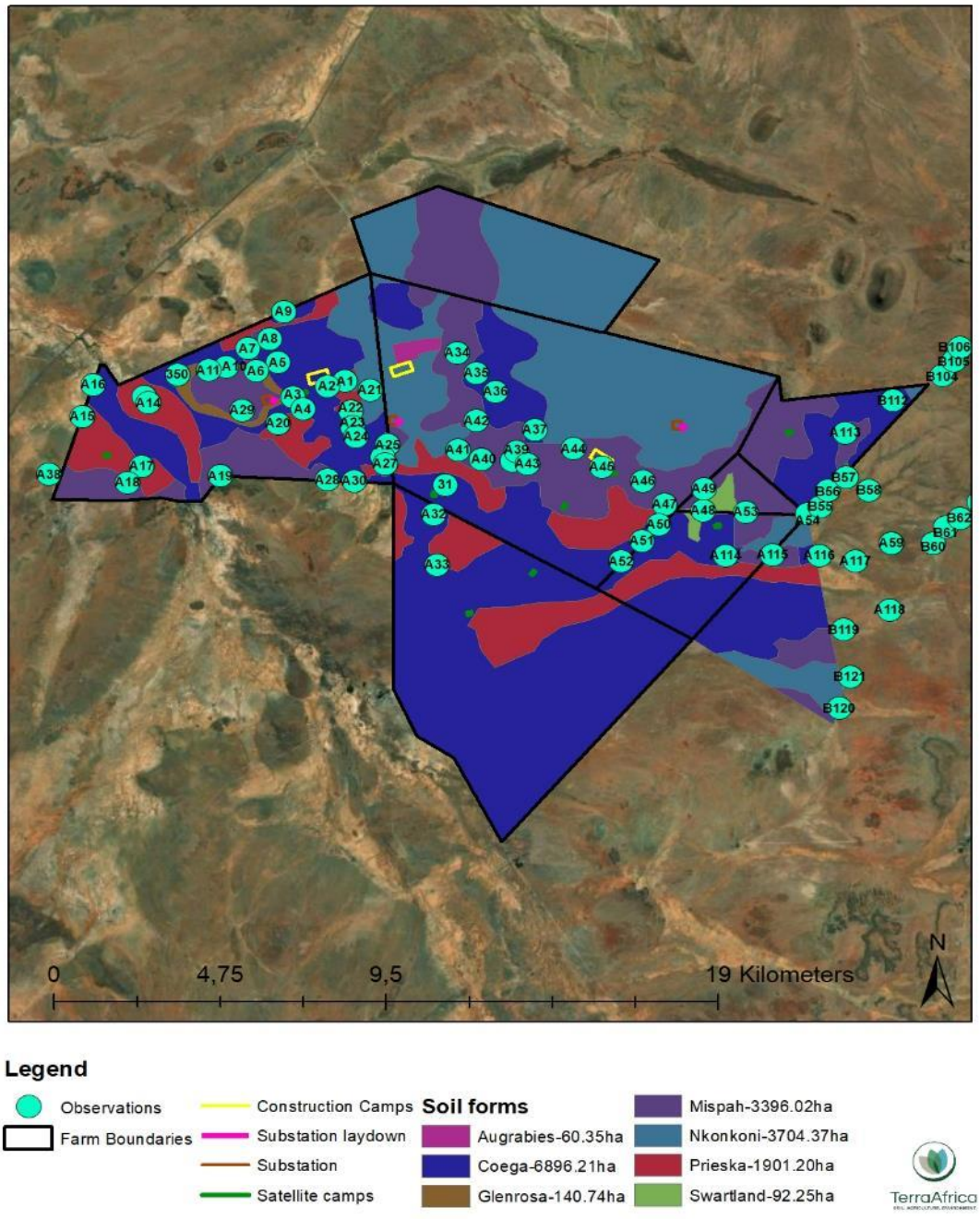


Figure 5-2: Soil classification map of Soyuz 1 WEF.

a) Augrabies

The Augrabies soil forms is the soil form least found in the study area and is only found on cultivated areas. The Augrabies covers approximately 60.35ha and has depths of 1.4 m. The Augrabies soil form

consists of an orthic A overlying a neocarbonate horizon. Soft carbonate modules are clearly visible within the neocarbonate horizon. The neocarbonate is weakly structured and thus infiltration will be adequate to sustain agricultural land.

a) Glenrosa

The Glenrosa soil form is found at the bottom parts of the Mispah/Rocky outcrops and covered 140.74ha. The Glenrosa consists of an orthic A, overlying a lithic horizon. The lithic was saprolithic. Saprolithic is defined as a lithic horizon recognized by its soft to friable consistence and remnant crystalline structure due to advanced weathering of underlying parent rock material. Most of the area consist of rock of the Volksrust Fm, Waterford Fm of the Ecca Grp which are Siliciclastic rocks and the Karro Dolerite Sui consisting of Fine-grained felsic rocks. The Glenrosa is shallow with depths of 0.2m.

a) Mispah and Coega

The Mispah (3396.02ha) and Coega (6896.21ha) soils have shallow soil depths ranging from 0.1-0.4m and covered most of the study area. The effective soil depth of the Mispah and Coega soils is restricted by solid and fractured rock and hard carbonate. The Mispah soil form is found mainly in the northern side of the project site, while the Coega is found in the southern side. The Mispah and Coega do not have a High or Medium agricultural sensitivity due to very shallow depth and restrictive layer. Thus, the soil forms has a low agricultural sensitivity.

a) Prieska

The Prieska soil form is found in the western and southeastern parts of the study area and covered approximately 1901.19ha. The Prieska soil form consists of an orthic A overlying a neocarbonate with hard carbonate underneath. The neocarbonate had a depth of 0.6m whereafter the hard carbonate horizon is found. The Prieska soil form is not preferred for agricultural cultivation due to the shallow soil depth and limiting hard carbonate layer.

a) Swartland

The Swartland soil forms is found in one area of the study area (eastern side) and covered approximately 92.25ha. The Swartland soil form consist of an orthic horizon overlying a pedocutanic horizon with lithic material underneath. Cutans were clearly present within the pedocutanic horizon. The lithic horizon was also saprolthic as defined for the Glenrosa. The depth of the pedocutanic is 0.5m whereafter the lithic horizon is found.

a) Nkonkoni

The Nkonkoni soil form covered the second most of the study area and is found in the northern side, and a small part in the eastern side of the project site. The Nkonkoni consists of an orthic A, overlying a red apedal with a lithic underneath). The Nkonkoni had a moderate depth ranging from 0.5-0.8m and thus classified as a medium agricultural sensitive soil. The lithic horizon was also saprolthic (as defined for the Glenrosa) as most of the area consist of rock of the Volksrust Fm, Waterford Fm of the Ecca Grp which are Siliciclastic rocks and the Karro Dolerite Sui consisting of Fine-grained felsic rocks.

5.5.2 LAND CAPABILITY

Following the classification of the soil, the consideration of other factors that influence rainfed crop production, and the capabilities of the climate (40%), Terrain (30%) and Soil (30%) of the project site, the land capability of the project site was determined. The land capability of the area is depicted in Figure 5-3.

The largest part of the Soyuz 1 WEF has Very low (Class 02) and Low-Very low (Class 03) Land capability (total-10292.23ha) and included the Mispah and Coega soil form. Low-Moderate (Class 07) classes

were assigned to the Nkonkoni soil form and had a lower land capability due the absence of field crops, irrigated land, or old fields. The Augrabies soil form has a Moderate-High (Class 09) land capability due to presence of cultivated fields. The Mispah soil forms, has Very low (Class 02) Land capability due to the shallow depth and presence of rocky outcrops (Figure 5-3:). The Glenrosa, Swartland and Prieska soil forms has Low (Class 05) land capability.

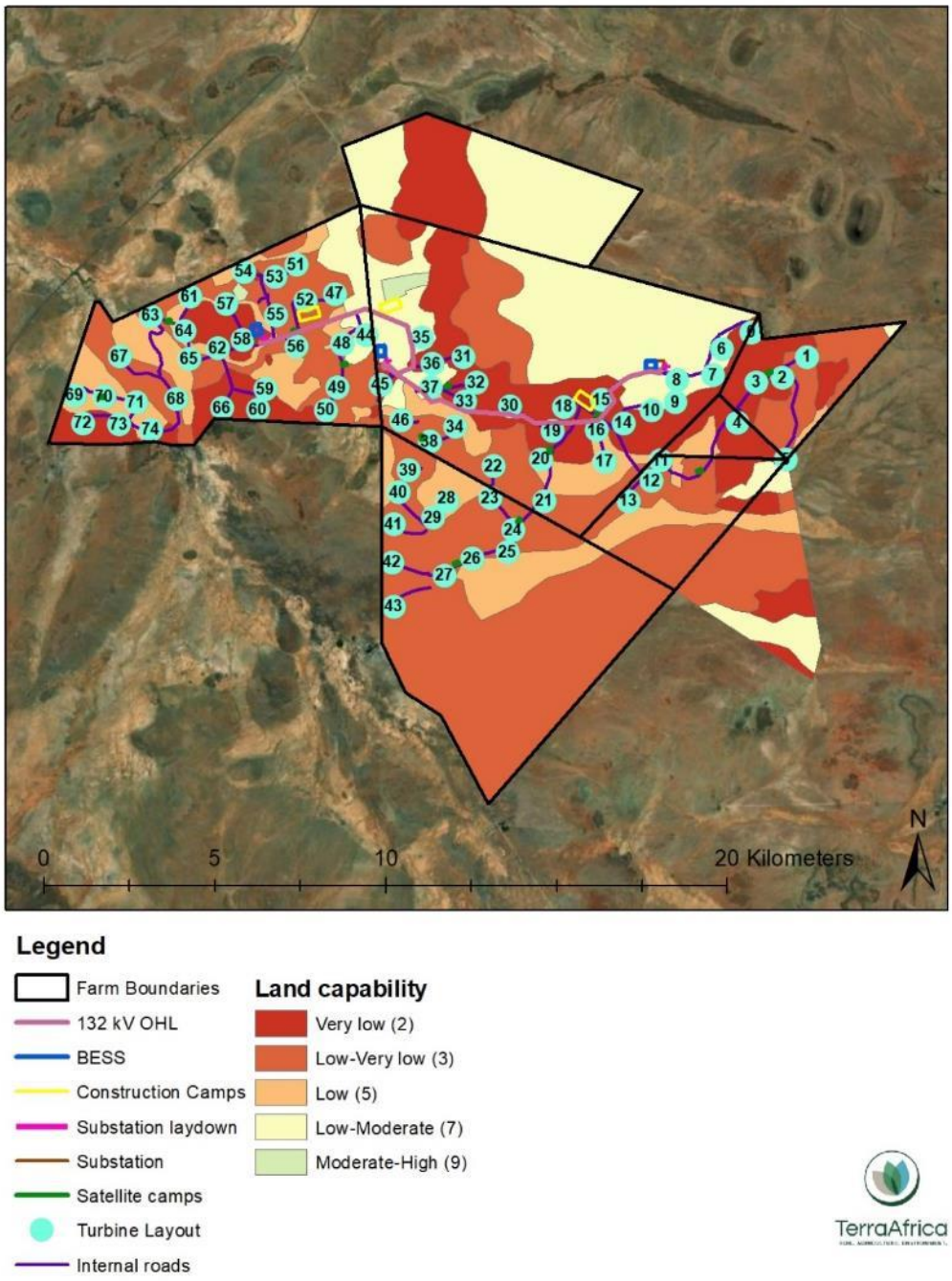


Figure 5-3: Land capability of the project site.

The long-term grazing capacity of the area is 24 ha/LSU (DALRRD, 2018).

5.5.3 LAND USE AND AGRICULTURAL ACTIVITIES

The Soyuz 1 WEF is mainly used for small stock farming (sheep) while two fields with rainfed lucerne (*Medicago sativa*) are also present within the project site. One centre pivot irrigated crop field is located 400m east of the R398, on the property where Rietpoort guest house is located.

The long-term grazing capacity of the area is 24 ha/LSU (DALRRD, 2018).

The ideal grazing capacity is an indication of the long-term production potential of the vegetation layer growing in an area. More specifically, it relates to its ability to maintain an animal with an average weight of 450 kg (defined as 1 Large Stock Unit (LSU)), with an average feed intake of 10 kg dry mass per day over the period of approximately a year. This definition includes the condition that this feed consumption should also prevent the degradation of the soil and the vegetation. The grazing capacity is therefore expressed in a number of hectares per LSU (ha/LSU) (DALRRD, 2018).

Since the livestock farmed with at the project site is sheep, the grazing capacity was converted to Small Stock Units (SSU). One LSU equates to about 4 SSUs. The grazing capacity of the project site is therefore 6 ha/SSU. The entire development footprint of the Soyuz 1 WEF infrastructure will not exceed 150 ha, therefore the number of SSUs that will be lost from the farming potential of the entire project site, is the forage of 25 sheep.

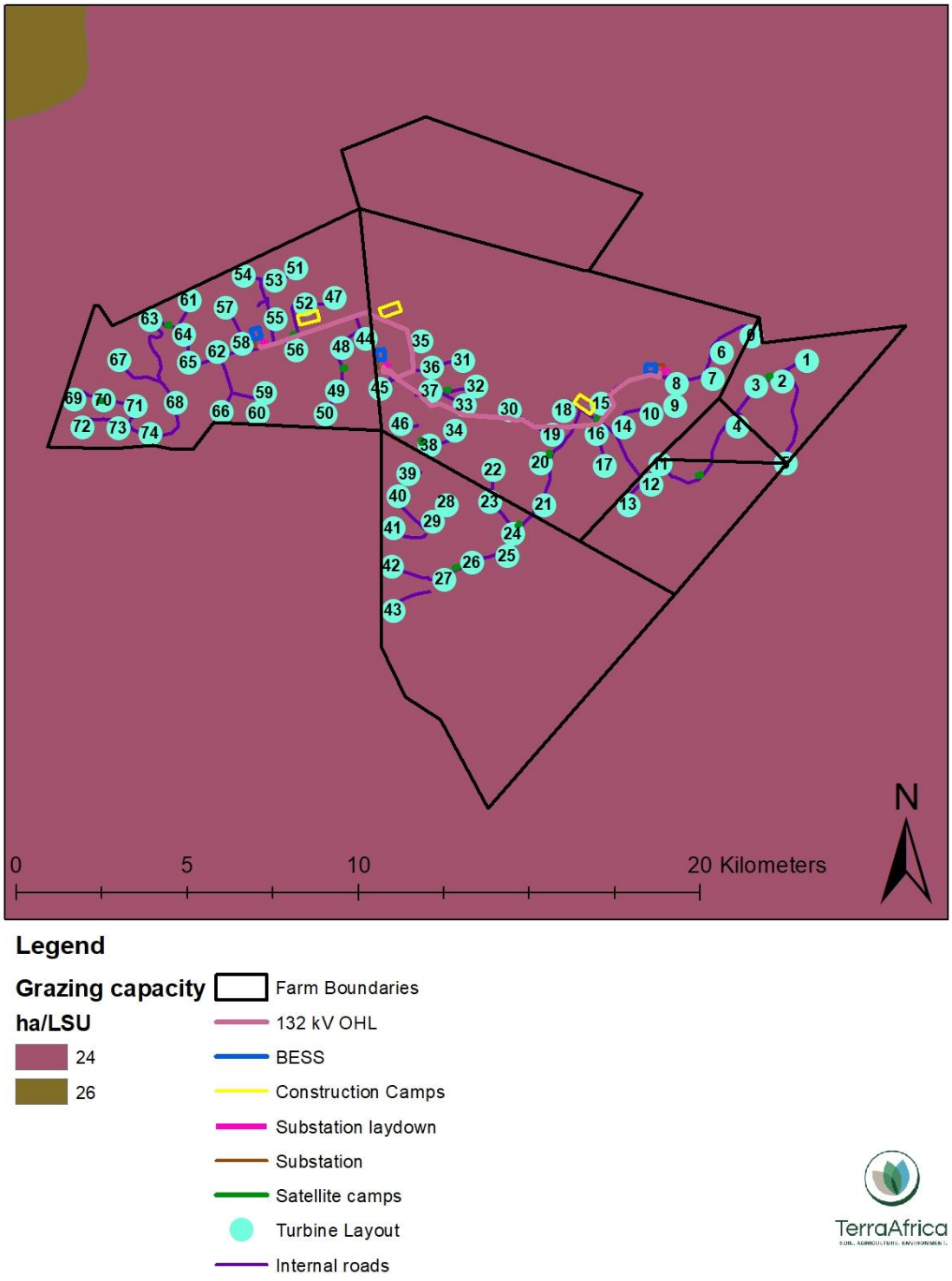


Figure 5-4: Long-term grazing capacity of the project site.

5.6 HERITAGE FEATURES

5.6.1 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.

5.6.2 Historical/Colonial Period

The first "Trekboers" moved through the landscape during the early 19th century but it was only in 1876 that Britstown was established as a Dutch Reformed Church parish. The town 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 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 sheperds. 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 De Aar and Britstown. A good example is the remains of the Imperial Yeomanry Hospital, the Yeomanry Hotel and war burial ground at Deelfontein along the southern periphery of the project area. Historical / Colonial Period remnants are generally viewed to have a medium to high significance on a regional level.

5.6.3 Graves/Cemeteries

Apart from the formal cemeteries that occur in municipal areas (e.g. in Britstown), 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.

5.7 Palaeontological Context of the Area

The **project area** is underlain by the Quaternary alluvium (Qs, yellow single bird figure), Jurassic dolerite (Jd, red), as well as the Abrahamskraal Formation (Pa- light green) (Beaufort Group, Karoo Supergroup. This part of the basin is extensively intruded by dolerite (Jd, red) dykes and sills and the surrounding Beaufort Group sediments have been baked thus compromising the fossil heritage of the area through thermal metamorphism. According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Quaternary superficial deposits is Moderate while that of the Adelaide Subgroup is Very High (Almond *et al*, 2013; SAHRIS website).

The **Cenozoic superficial** deposits are the youngest geological deposits formed during the most recent geological period (approximately 2.6 million years ago to present). Most of the superficial deposits are unconsolidated sediments and consist of clay, gravel, sand, silt, that form relatively thin, discontinuous patches of sediments. These sediments comprise of channel, floodplain, and stream deposits.

The Cenozoic deposits are very important because palaeoclimatic changes are reflected in the different geological formations (Hunter *et al*., 2006). During the climate fluctuations in the Cenozoic Era most geomorphologic features in southern Africa where formed (Maud, 2012). Barnosky (2005) indicated that various warming and cooling events occurred in the Cenozoic but states that climatic changes during the Quaternary Period, specifically the last 1.8 Ma, were the most drastic climate changes relative to all climate variations in the past. Climate variations that occurred in the Quaternary Period were both drier and wetter than the present and resulted in changes in river flow patterns, sedimentation processes and vegetation variation (Tooth *et al*., 2004).

Cenozoic fossil assemblages are generally rare and low in diversity and occur over a wide-ranging geographic area. These fossil assemblages may in some cases occur in extensive alluvial and colluvial deposits. In the past palaeontologists did not focus on Caenozoic superficial deposits although they

sometimes comprise of significant fossil deposits. These fossil assemblages resemble modern animals and may comprise of mammalian teeth, bones and horn corns, reptile skeletons and fragments of ostrich eggs. Microfossils, non-marine mollusc shells are also known from Quaternary deposits. Plant material such as foliage, wood, pollens, and peats are recovered as well as trace fossils like vertebrate tracks, burrows, termitaria (termite heaps/ mounds) and rhizoliths (root casts).

A few dolerite dykes and sills are present in the development footprint while the area north and west of the development is extensively intruded by dolerite dikes and sills (Jd, red) of the Karoo Igneous Province. These dolerite intrusions have baked the surrounding potentially fossiliferous bedrock through thermal metamorphism thus influencing the quality of fossil preservation. The Karoo Igneous Province in southern Africa is a classic continental flood basalt province that was formed during the Early Jurassic Period. This province occurs over a comprehensive area in southern Africa and comprises a widespread system well developed igneous bodies (dykes, sills) that invaded the sediments of the Main Karoo Basin. Flood basalts do not typically form any visible volcanic structures, but with a series of outbursts form a suite of fissures of sub-horizontal lava flows that may vary in thickness. The Karoo is an old flood basalt province and is preserved today as erosional remnants of a more extensive lava cap that covered much of southern Africa in the geological past. This Suite is entirely unfossiliferous.

The flood plains of the Beaufort Group (Karoo Supergroup) are internationally renowned for the early diversification of land vertebrates and provide the worlds' most complete transition from early "reptiles" to mammals. The Beaufort Group is subdivided into a series of biostratigraphic units based on its faunal content (Kitching 1977; Keyser *et al*, 1977; Rubidge 1995; Smith *et al*, 2020; Viglietti 2020).

The Soyuz 1 WEF is underlain by Quaternary alluvium, Tertiary to Quaternary calcrete, Jurassic dolerite, and the Tierberg Formation (Ecca Group, Karoo Supergroup). According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Quaternary alluvium, Tertiary to Quaternary calcrete is Moderate, while that of the Tierberg Formation (Ecca Group, Karoo Supergroup) is High. The Palaeontological Sensitivity of the Jurassic dolerite is Zero as it is igneous in origin (Almond and Pether, 2009; Almond et al., 2013).

The *Tapinocephalus* AZ is characterised by the tapinocephalid dinocephalian species *Tapinocephalus atherstonei* and *Moschops capensis*, the dicynodont *Eosimops newtoni*, and *Robertia broomiana* and the pareiasaur *Bradysaurus baini*. The *Tapinocephalus* AZ is a rich tetrapod assemblage zone that consists of basal members of therapsid clades Biarmosuchia, Anomodontia, Dicynodontia, Therocephalia, and Gorgonopsia; basal members of the parareptilian clade Pareiasauria; and rare varanopids as well as derived members of the therapsid clade Dinocephalia.

This AZ includes dinocephalians (*Moschops capensis*), basal pareiasaurs (*Bradysaurus*) that co-occur with pylaecephalid dicynodonts *Eosimops*. and *Robertia*. This AZ has a maximum thickness of about 1500 m. The Assemblage Zone can be subdivided into two subzones based on the absence of the dicynodont Diictodon feliceps: in the lower Eosimops - Glanosuchus Subzone and the presence of Diictodon in the upper Diictodon Eosimops - Glanosuchus Subzone. The contact between these subzones is the first appearance of *Diictodon felips* at the base of the Moordenaars Member. The upper part of the biozone reflects the Capitanian mass extinction and the low diversity post extinction. The first appearance of *Endothiodon bathystoma* terminates the zone.

5.8 LANDCOVER

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

Figure5-4 illustrates the landcover of the Soyuz 1 WEF site and surrounding areas (Northern Cape Land Use Data, AGIS).

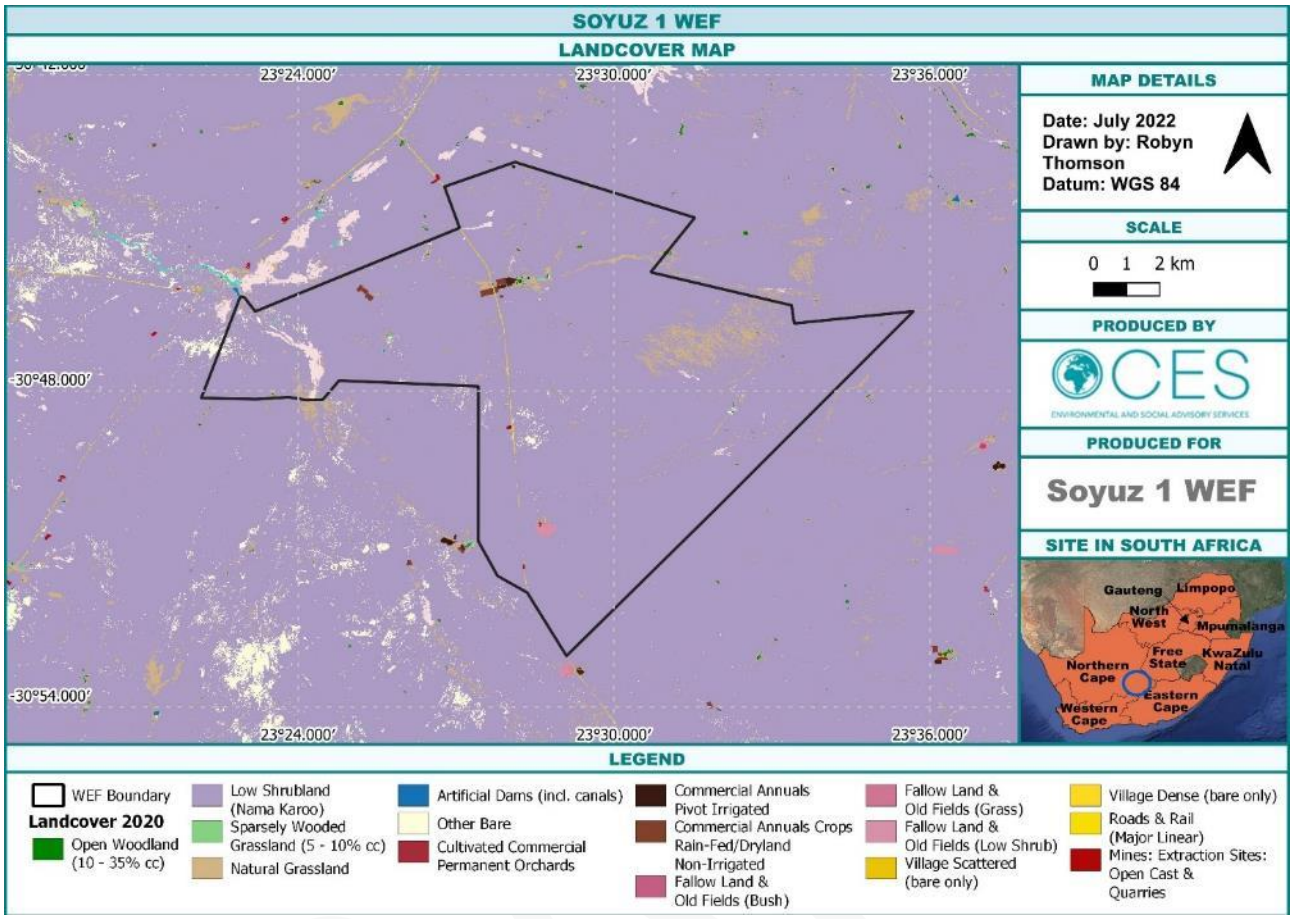


Figure 5-5: Landcover Map of the Soyuz 1 WEF site and surrounding areas.

5.9 VEGETATION & FLORISTICS

5.9.1 EASTERN UPPER KAROO

The Eastern Upper Karoo vegetation type is the dominant vegetation type within the project site. It is relatively widespread occurring in the Northern Cape, Eastern Cape and Western Cape Provinces between Carnarvon, Loxton, De Aar, Petrusville and Venterstad in the north, Burgersdorp, Hofmeyer and Cradock in the east and the Great Escarpment in the south (Mucina *et al.,* 2011).

It occurs on gently sloping plains that are typically interspersed with rocky areas of Upper Karoo Hardeveld in the west, Besemkaree Koppies Shrubland in the northeast and Tarkastad Montane shrubland in the southeast. This vegetation type is characterised by dwarf microphyllous shrubs interspersed with grasses such as *Aristida and Eragrostis.*

Eastern Upper Karoo occurs within the flat to gently sloping areas of the site and is broken up by high lying ridges of Upper Karoo Hardeveld. Although the vegetation present is near natural, it does show evidence of disturbance from grazing.

Within the project site there were distinct differences in species assemblages within this vegetation type. Areas characterised by shallow calcrete soils were dominated by dwarf karoo scrub with a low grass cover. Species assemblages included *Eriocephalus ericoides, Chrysocoma ciliata, Pentzia incana, Ruschia intricata, Aptosimum spinescens* and *Asparagus exvuvialis. Chrysocoma ciliata* typically colonises over-grazed areas characterised by disturbance and as such indicates that areas where it is abundant are considered degraded (Fitchett *et al., 2017)*.

Species assemblages within washes were similar to those observed within the shallow calcrete soils and were dominated by dwarf karoo scrub dominated by *Chrysocoma ciliata*. Grass cover in these areas was sparse.

Deeper soils typically had a higher grass cover and fewer shrubs. Species assemblages included *Chloris virgata, Aristida congesta, Aristida diffusa, Eriocephalus ericoides, Eragrostis lehmanniana, Stipagrostis ciliata* and *Pentzia incana*.

Eastern Upper Karoo is listed as Least Concern with a conservation target of 21%. Although listed as poorly protected, current data indicates that 97% of this vegetation type remains intact (RLE, 2021).

5.9.2 Northern Upper Karoo

The Northern Upper Karoo occurs in the Northern Cape and Free State Provinces and is described as a shrubland dominated by dwarf karoo shrubs, grasses and *Senegalia mellifera subsp. Detinens* (Mucina *et al.,* 2011).

This vegetation type is listed as Least Concern with a conservation target of 21%. Although listed as not protected, current data indicates that 94% of this vegetation type remains intact (RLE, 2021).

This vegetation type was not recorded on site.

5.9.3 Upper Karoo Hardeveld

This vegetation type is relatively widespread occurring in the Northern Cape, Eastern Cape and Western Cape Provinces between Middelpos, Strydenberg, Richmond and Nieu-Bethesda. It is associated with steep slopes and ridges including dolerite dykes and sills that form mesas, buttes and koppies, as well as parts of the Great Escarpment. These areas are typically covered by large boulders and rocks and support dwarf karoo scrub and grasses belonging to the genera *Aristida, Eragrostis and Stipagrostis* (Mucina *et al.,* 2011).

Upper Karoo Hardeveld occurred on the slopes and plateaus of the mesas and dykes present within the site (Figure 3.5). These areas are typically more diverse than the Eastern Upper Karoo and includes species such as *Searsia burchelli, Euclea coriacea, Lycium cinereum, Lycium horridus, Diospyros lycioides, Boophone disticha, Aloe claviflora, Hermannia cf. vestita, Cheilanthes eckloniana, Themeda triandra* as well as on occasion succulents such as *Stomatium mustellinum* and *Curio radicans.*

Upper Karoo Hardeveld is listed as Least Concern and has a conservation target of 21%. Although listed as poorly protected, it is estimated that 100% of the natural remaining extent is intact.

5.9.4 Floristics

A total of 81 species from 35 families were recorded within the project site. The Asteraceae family had the highest number of species (13 species) followed by Poaceae (ten species), Amaranthaceae and Scrophulariaceae (both had four species) and then Aizoaceae, Anacardiaceae, Asparagaceae, Ebenaceae, Malvaceae and Solanaceae (all with three species). Of the 81 recorded species, 75 species are listed as least concern and six are listed as Not Evaluated. No Species of Conservation Concern (SCC) were recorded on site and no SCC were identified in the Plants of Southern Africa (POSA) database for the general area.

Although no SCC were recorded, one species is listed as Schedule 1 and fourteen as Schedule 2 species on the Northern Cape Nature Conservation Act (2009). These species will require permits for their removal/destruction if impacted by project infrastructure.

The DFFE screening report for the project site lists one SCC (*Tridentea virescens*) that could occur within the site. Properties further south also list *Hereroa concava* as possibly occurring within the area and as such the likelihood of occurrence for both species was assessed.

Hereoa concava was determined to have a moderate likelihood of occurrence on shale plateaus and outcrops and *Tridentea virescens* was determined to have a high likelihood of occurrence within the washes present on site. Since these two species are associated with specific niche habitats, project infrastructure can be placed to avoid impacting these populations should they be found on site. 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.

5.9.5 Alien Species

Six exotic species were recorded within the project site (Table 3.3) and were typically found within disturbed sites such as along road verges. Of these six species, only one (*Opuntia ficus-indica*) is a listed (Category 1b) alien invasive species. The spread of a category 1b species is prohibited and as such an alien invasive management plan for the removal of this species must be included in the EMPr.

5.10 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.

As evident in Figure 5-6 below, no CBA areas are affected by the Soyuz 1 WEF.

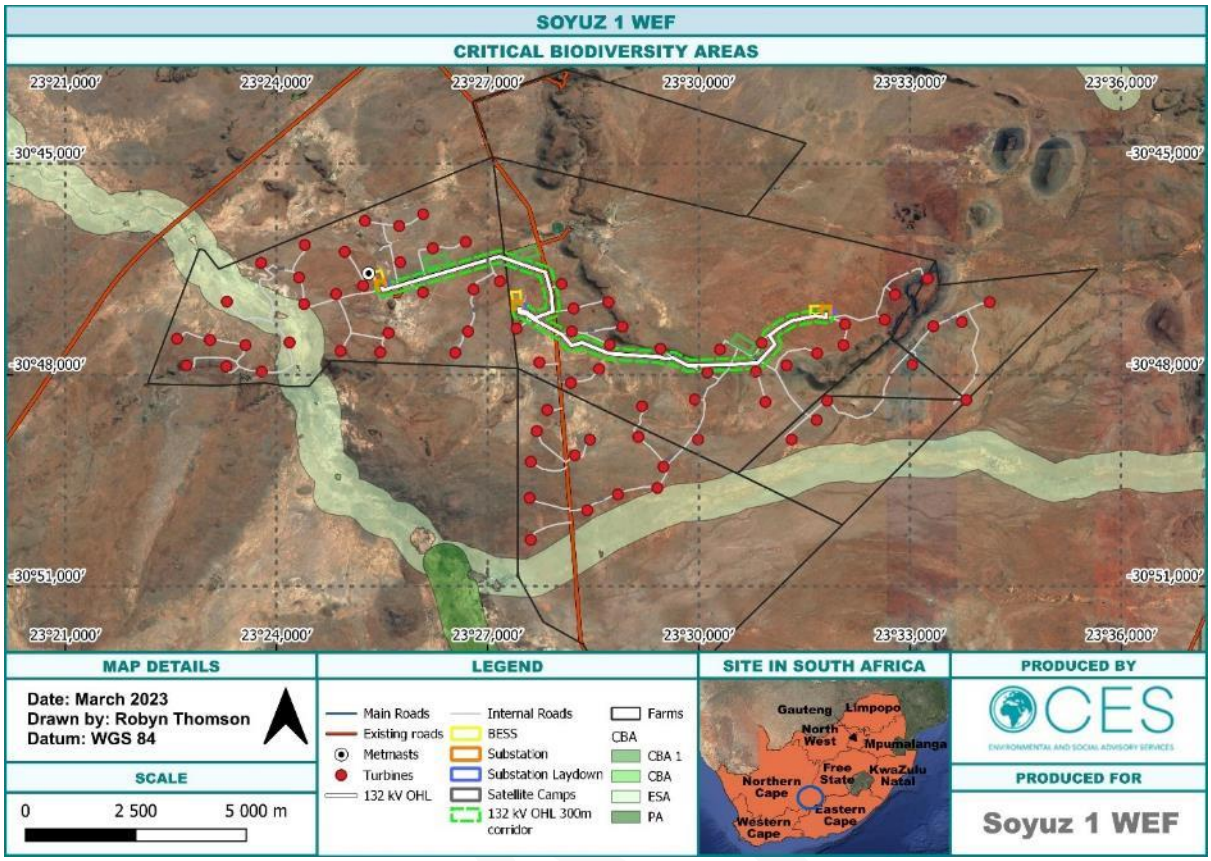


Figure 5-6: CBA Map of the proposed Soyuz 1 WEF site and surrounding areas.

5.11 NORTHERN CAPE PROTECTED AREA EXPANSION STRATEGY

No protected areas are located on the proposed WEF site (Figure 3-6). The closest protected area is the National Mountain Zebra/ Camdeboo Environment, located approximately 100 km to the southeast. The Meerkat National Park is located 150 km to the west of the WEF. Several areas surrounding the WEF, approximately 70 km north and east and 100 km south of the WEF, have been identified by the NCPAES as a Primary Focus area.

5.12 FAUNAL HABITATS

Habitats are defined in this study as the natural environment or place where faunal species live, breed and/or forage. Each habitat type has different environmental conditions and structure which influences a species distribution range. Five faunal habitats were identified in the study area, namely:

1. Grassland (subset of Eastern Upper Karoo).
2. Wash and Dwarf Succulent Karoo Shrubland (subset of Eastern Upper Karoo).
3. Rocky slopes and plateaus (subset of Upper Karoo Hardeveld).
4. Rivers (annual and perennial), wetlands and incidental pools.
5. Manmade.

5.12.1 GRASSLAND

The grassland was present in the flat, low-lying plains of the project area. This habitat typically has a canopy cover of 75-90% in the summer months during which it is dominated by grasses but this decreases during the dry winter months to <50%, leaving the scattered dwarf shrubs visible. Vegetation structure was approximately 0.5m and uniform throughout the site. These areas typically had termite mounds and burrows, including confirmed burrows for bat-eared foxes.

5.12.2 Wash and Dwarf Succulent Karoo Shrubland

The washes typically had a higher moisture content but were structurally similar to the dwarf succulent karoo which occurred on shallow calcrete soils. Canopy cover was 50-75% and plant height were less than 0.5m. There were occasional larger shrubs of 1-1.5 m in height scattered throughout this habitat.

5.12.3 Rocky Habitat (Slopes, Plateaus and slabs)

Plant cover on the rocky slopes was 25-50% and was interspersed between the rocks and boulders present. Structurally, the vegetation was more diverse with larger shrubs and small trees of 2-2.5 m interspersed between grassland, herbs and succulent shrubs. Additionally, the rocky outcrops and ledges provided crevices for faunal species to hide. The rocky habitats present differently on the mesas, buttes and plateaus and dolerite sills and dykes.

5.12.4 Rivers, wetlands and incidental pools

The study area landscape offers a number of aquatic related habitat, including riverine systems, large bodies of water, saturated depressions creating temporary pools and vleis, wetlands or inundated grasslands. Each present a different structure for fauna to inhabit, wetlands provide vegetation for cover whereas incidental pools provide temporary access to water.

5.12.5 Manmade

Built structures such as houses and sheds etc. offer faunal species shelter, some small faunal species often take refuge in the eaves of roofs and crevices in walls.

5.13 Faunal Species

All species have a unique geographic range which describes the spatial area where a species is found. This is a species distribution. Some species have a range which covers most of the earth, this is known as a cosmopolitan distribution and others a very limited geographic area known as an endemic distribution. However, just because an area may be within a species distribution the species may no longer inhabit the area or may not inhabit it permanently. For example, large carnivores such as lion have a distribution which include the project area, but these animals no longer occur outside of reserves and private game farms. Further, a species may occur in the broader area (QDS/Pentad) where habitat is available and if its preferred habitat is not present onsite it is unlikely to occur. Therefore, the number of species that could occur in the PAOI and in the project area is often far fewer than species distributions.

The Nama Karoo Biome hosts approximately 50 frog species, 221 reptile species and 177 mammal species (CSIR, 2019). The Britstown project area is within the distribution range of 13 amphibian, 48 reptile species and 64 mammal species (FitzPatrick, 2022; IUCN, 2022; iNat, 2022.

5.13.1 Amphibians

Of the 13 amphibian species with a distribution that includes the project area nine species have been confirmed within the study area (FitzPatrick, 2022; iNat, 2022). The field survey recorded three of these amphibian species, namely, the Tandy's Sand Frog (*Tomopterna tandyi*) was recorded from two drift fence funnel traps in the north of the study area, puddles in the road and from small pools in wash in the central east of the study area. Boettger's Caco (*Cacosternum boettgeri*) recorded from the northeastern drift fence funnel trap and storage dam in the north. The Giant African Bullfrog (*Pyxicephalus adspersus*) was recorded from the wash in the west of the study area.

Microhabitats important to amphibian species include terrestrial and aquatic habitats i.e., not all amphibians require permanent access to water, some species only require access to water for

breeding and egg/tadpole development and some species do not require any water and are fully terrestrial.

5.13.2 Amphibian Species of Conservation Concern

None of the amphibian species that have a distribution which includes the project area are of conservation concern.

5.13.3 Reptiles

Of the 48 reptile species with a distribution that includes the project area 36 species have been confirmed within the study area (FitzPatrick, 2022; iNat, 2022). The field survey recorded three snake species, two tortoise, one terrapin and eight lizard species.

The Leopard Tortoise (*Stigmochelys pardalis*) was recorded from 14 locations across the study area with the majority see along the R398 road and in grassland habitats.

The Marsh Terrapin (*Pelomedusa galeata*) was recorded from a road puddle in the central east area of the study area.

The Cape Cobra (*Naja nivea*) was recorded from grassland habitat in the Soyuz 6 WEF to the south of the Soyuz 1 project site. Three of the drift fence funnel traps in the north of the study area trapped snakes including the Karoo Sand Snake (*Psammophis notostictus*), Spotted Skaapsteker (*Psammophylax rhombeatus*) and a juvenile Cape Cobra.

Rocky outcrops across the study site hosted lizards associated with the habitat including the Southern Rock Agama (*Agama atra*), Karoo Girdled Lizard (*Karusasaurus polyzonus*) and Western Rock Skink (*Trachylepis sulcate*). The Bibron's Gecko (*Chondrodactylus bibronii*) was also at rocky outcrops as well as at the buildings in the north of the study area capitalising on the insects attracted to the light. The Spotted Desert Lizard (*Meroles suborbitalis*), Spotted Sandveld Lizard (*Nucras intertexta*) and Karoo Sand Lizard (*Pedioplanis laticeps*) were recorded in the Grassland and Dwarf Succulent Karoo Shrubland habitats. The Common Ground Agama (*Agama aculeata*) and Variegated Skink (*Trachylepis variegate*) were common across the site with many *A. aculeata* sunning themselves on the roads.

5.13.4 Reptile Species of Conservation Concern

Two reptile species of conservation concern have a distribution which includes a portion of the study area. Namely, the Karoo Dwarf Tortoise (*Chersobius boulengeri*) listed as Endangered and the Tent Tortoise (*Psammobates tentorius*) listed as Near-Threatened (Hofmeyr, *et. al*., 2018; Hofmeyr, Leuteritz & Baard, 2018).

The Karoo Dwarf Tortoise (*Chersobius boulengeri*) has a distribution which includes the north-western portion of the study area. This species is endemic to South Africa and inhabits dwarf shrubland (800-1500m asl) in portions of the Succulent Karoo, Nama Karoo and Albany Thicket biome were dolerite ridges and rocky outcrops associated with succulent and grassy vegetation elements occur. It shelters under rocks in vegetated areas or in rock crevices (Hofmeyr, *et. al*., 2018). It has an EOO: 135,090km^2 and an AOO: 4 708 km^2. The nearest recent record is from near Loxton approximately 140km SW (iNat, 2022).

This species has a *high likelihood of occurrence* within the study area that contains rocky outcrop habitat. The actual footprint of all six wind energy facilities is estimated at 9km^2 (900ha), which is 0.007% of the species extent of occurrence. This species is considered to be well protected within south African conservation areas (Tolley, *et. al.,* 2019). Given the size of the proposed project in relation to the species area extent of occurrence and that it is considered well protected the project is unlikely to negatively influence the viability of this species. However, it is still an endangered species and mitigation measures must be implemented to prevent further loss of this species by this project.

The Tent Tortoise (*Psammobates tentorius)* is listed as Near-threatened and is restricted to South

Africa and Namibia to areas below 1500m asl (Hofmeyr, Leuteritz & Baard, 2018). Although widespread (EOO: 595,920km^2) the population density is generally low with 5-6 sub-populations representing three subspecies, namely, *Psammobates t. tentorius*; *Psammobates t. trimeni and Psammobates t. verroxii* (Hofmeyr, Leuteritz, & Baard, 2018). Subspecies distribution appears is linked to rainfall and elevation; however, all subspecies inhabit shrubland. P.t. *tentorius occurs in* scrubland with succulents, annuals, grasses and geophytes and *P.t. trimeni occurs in areas* dominated by dwarf succulent shrubs and annuals (Hofmeyr, Leuteritz, & Baard, 2018).

This species was *confirmed* within the study area, three individuals were recorded from the R398, the road bisecting the study area. This species is therefore highly likely to occur throughout the study area. Given the proposed project is 0.002% of this species EOO and that it is considered well protected, the project is unlikely to negatively influence the viability of this species. However, it is still an endangered species and mitigation measures must be implemented to prevent further loss of this species by this project.

5.13.5 Mammals

Of the 64 mammal species with a distribution that includes the project area, 36 species have been confirmed within the study area (FitzPatrick, 2022; iNat, 2022). The field survey recorded 20 mammal species.

The field survey recorded seven carnivore species. At the southern trap array a number of burrows were found in the grassland habitat and camera traps confirmed the presence of Bat-eared Fox (*Otocyon megalotis*) and five individuals were seen one morning investigating the trap array. Two individuals were also found dead on the R398. Other roadkill included the African Wildcat (*Felis silvestris*), the Southern Aardwolf (*Proteles cristatus*) and Yellow Mongoose (*Cynictis penicillata*). A live Aardwolf was recorded on a camera trap in the large wash habitat in the central east portion of the study area. The Yellow Mongoose (*Cynictis penicillata*) and Meerkat (*Suricata suricatta*) were the most prevalent diurnal carnivores recorded in the study area. In addition, the Slender Mongoose (*Herpestes sanguineus*) and Cape Grey Mongoose (*Herpestes pulverulentus*) was also recorded. Farmers in the area report the Black-backed Jackal (*Canis mesomela*) as a pest as they will prey on lambs.

Six rodents were recorded from the study area with the most conspicuous being the Ground Squirrel (*Xerus inauris*), this diurnal species lives in colonies of up to 30 individuals and their extensive burrow system is often within the road and road verges and was recorded as common across the study area. The Highveld Gerbil (*Gerbilliscus brantsii*), Pouched Mouse (*Saccostomus campestris*), Four-striped Grass Rat (*Rhabdomys pumilio*) and Pigmy Mouse (*Mus minutoides*) were captured in traps (Sherman or funnel). Evidence of the Cape Porcupine (*Hystrix africaeaustralis*) was found across the site e.g., quills, skat, burrows, and foraging sites.

The study area hosts both naturally occurring antelope and introduce game antelope. Introduced species include the Eland, Gemsbok, Sable and Kudu. Naturally occurring species include the Steenbok, Duiker, Grey Rhebok, Mountain Reedbuck, Blesbok and Springbok. Although some farms stock Springbok, vast herds of Springbok used to migrate through the region and small herds still occur naturally (CSIR, 2019). Five Antelope species were confirmed during the field survey including Steenbok, Mountain Reedbuck and Springbok were sited within the study area and the camera traps captured Steenbok, Springbok and Blesbok.

Other mammal species recorded in the study area include the Rock Sengi (*Elephantulus sp*.), recorded at three different rocky outcrops, an individual Vervet Monkey (*Chlorocebus pygerythrus*) recorded at an abandoned farmhouse in the central east of the study area, Rock Hyrax (*Procavia capensis*) recorded at multiple rocky outcrops across the study area and two Lagomorphs. A Rock Hare (*Pronolagus sp.)* was flushed on top of one of the meses and Scrub Hares (*Lepus sp.*) were seen at multiple sites across the study area while driving and walking.

5.13.6 Mammal Species of Conservation Concern

The study area intersects the distribution of seven mammal species of conservation concern, four threatened and three near-threatened species. Threatened species includes the Mountain Reedbuck (*Redunca fulvorufula*), Black-footed Cat (*Felis nigripes*), African White-tailed Mouse (*Mystromys albicaudatus*) and Leopard (*Panthera pardus*). Near-threatened species includes the Grey Rhebok (*Pelea capreolus*), Brown Hyaena (*Parahyaena brunnea*) and Cape Clawless Otter (*Aonyx capensis*). Two species, Black-footed Cat (Felis nigripes) and African White-tailed Mouse (*Mystromys albicaudatus*), have a high likelihood of occurrence in the study area and the Mountain Reedbuck (*Redunca fulvorufula*) was confirmed at two locations within the study area.

The Riverine Rabbit (*Bunolagus monticularis*) was flagged by the DFFE Screener as Medium sensitivity due to the proximity of the existing population and the potential for suitable habitat within the study area. Riverine Rabbit (*Bunolagus monticularis*) is listed as critically endangered and occurs mainly outside of formally protected areas. There are three known populations with 12 subpopulations (9 in the northern range and 3 southern range). It has an EOO of 54,227 km^2 and an AOO of 2,943 km^2. The Riverine Rabbit inhabits dense, discontinuous vegetation fringing the seasonal rivers and constructs burrows in soft and deep alluvial soils along the river courses for breeding. It is a browser strongly associated with selected plant species such as *Pteronia erythrochaetha, Kochia pubescens, Salsola glabrescens* and *Mesembryanthemaceae.* The Riverine Rabbit is considered a cryptic species, it is predominately solitary and nocturnal. The Riverine Rabbit distribution range is outside of the project footprint.

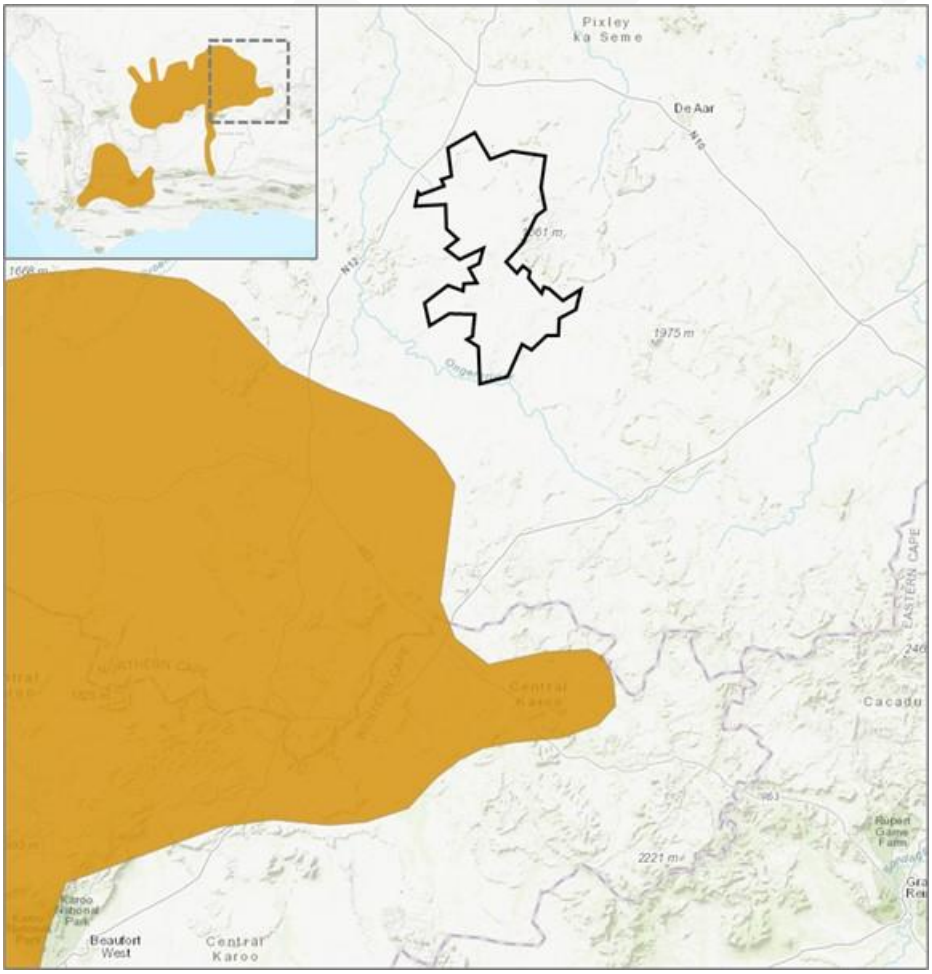


Figure 5-7: Riverine Rabbit (*Bunolagus monticularis*) northern subpopulation distribution in relation to the study area (black shape).

5.13.7 AVIFAUNA (BIRDS)

The second South African Bird Atlas Project (SABAP2 – www.sabap2.birdmap.africa) has recorded a combined total of 145 species. This included 19 Priority Species, 8 species classified as Endangered, Near Threatened or Vulnerable and 17 endemic or near-endemic species. Due to the relatively few full protocol surveys conducted in some of the pentads this list cannot be considered to be complete.

There are 10 Co-ordinated Avifaunal Roadcount (CAR) routes (NK033, NK201, NK202, NK203, NK321, NK322, NK323, NK451, NK452, and NK453) that run through the proposed development area. Blue Crane, Karoo Korhaan, Northern-black Korhaan, Ludwig's Bustard, and Secretarybird have been recorded along these routes. Four Co-ordinated Waterbird Counts Project (CWAC) sites (Nuwejaarsfontein Farm Dam, Nuwejaarsfontein House Dam, De Aar Sewage Works, and Wortelfontein Dam) are located near the proposed development area, between 22 and 31 km in an easterly direction. Priority Species that have been recorded at these sites include Black Stork, African Fish Eagle, Greater Flamingo and Maccoa Duck.

The proposed development area is located adjacent to the Platberg–Karoo Conservancy (SA037) Important Bird Area (IBA), with its closest point less than 2 km away. The IBA was established specifically due to the presence of several globally and regionally threatened species of large terrestrial birds and raptors, certain biome-restricted passerines, and congregatory species. Globally threatened bird species include Blue Crane, Ludwig's Bustard, Kori Bustard, Secretarybird, Martial Eagle, Blue Korhaan, Black Harrier and Denham's Bustard. Regionally threatened species include Black Stork, Lanner Falcon, Tawny Eagle, Karoo Korhaan and Verreaux's Eagle. Biome-restricted species include Karoo Lark, Karoo Longbilled Lark, Karoo Chat, Tractrac Chat, Sickle-winged Chat, Namaqua Warbler, Layard's Tit-Babbler, Pale-winged Starling, and Black-headed Canary. Besides the presence of large resident raptors, congregatory species such as Amur Falcon and Lesser Kestrel also occur here, with almost 10% of the global population of Lesser Kestrels roosting in this conservancy during summer. The IBA is also seasonally important for White Stork during insect outbreaks.

The Verreaux's Eagle Risk Assessment (VERA) tool identified several previously identified Verreaux's Eagle nest locations on the Kombuisfonteinberg and Waterval se Berge in the central-eastern portion of the site as well as on the dolerite intrusions on Perdepoort and Twyfelhoek. The output of the VERA tool was used in conjunction with the Verreaux's Eagle habitat suitability model to determine areas likely to be utilised by the species.

The species predicted to occur on the project site was determined by the desktop study results. The desktop study revealed 29 potential Priority or Avifaunal Species of Conservation Concern (SCC) that are known to occur in and around the study area, including the Endangered Ludwig's Bustard and Martial Eagle, as well as the Vulnerable Secretarybird and Verreaux's Eagle. In addition to these red-listed species, Priority Species such as Northern Black Korhaan, Blue Korhaan, and Jackal Buzzard have been recorded in the area and likely occur in the broader impact zone in good numbers. Long-term data on waterbird numbers reveal that most red-listed water-dependant species appear to occur infrequently at low densities in the area, but include the Vulnerable Black Stork, as well as the Near-Threatened Maccoa Duck and Greater Flamingo.

The shrubland plains habitat usually supports a relatively low diversity of bird species comprising both small passerines and non-passerines. The passerine species assemblage of the site is expected to be typical of similar areas in the Nama Karoo Biome, with the most commonly encountered species expected to be African Rock Pipit (Near-Threatened), Eastern Clapper Lark, Spike-heeled Lark, African Pipit, Rufous-eared Warbler, and Largebilled Lark. We therefore predict to find many endemic and near-endemic passerine species throughout the study site. Many of the red-listed non-passerines usually occur in shrubland plains and therefore it is highly likely for them to occur in the study site. It is also predicted that raptors use the ridges on a regular basis in addition to the plains.

5.13.8 Avifaunal Species of Conservation Concern

Regional Context

The proposed development site falls within the nama-Karoo biome in a transition zone between two broad vegetation types, where the southern extent of the Northern Upper Karoo meets the northern extent of the Eastern Upper Karoo. The proposed development site lies to the west of the Platberg-Karoo Conservancy Important Bird Area (IBA SA037). This is a large IBA that covers the entire districts of De Aar, Philipstown and Hanover, including suburban towns. The landscape consists of extensive flat to gently undulating plains that are broken by dolerite hills and flat-topped inselbergs. The land is used primarily for grazing and agriculture. Commercial livestock farming is mostly extensive wool and mutton production, with some cattle and game farming. This IBA contributes significantly to the conservation of large terrestrial birds and raptors. These include Blue Crane, Ludwig's Bustard, Kori Bustard, Blue Korhaan, Black Stork, Secretarybird, Martial Eagle, Verreaux's Eagle, and Tawny Eagle.

Local Context

The majority of the proposed development site comprises relatively flat shrubland plains, with higher elevation areas found along the eastern border of the site and scattered in the north (Figure B.1). These areas include Upper Karoo Hardeveld vegetation and provide higher levels of habitat complexity than the flatter areas below. The cliffs and outcrops associated with dolerite rings and intrusions are prominent features that potentially provide nesting and foraging habitat for Verreaux's Eagle while the flatter areas may support cranes, bustards, korhaans, Secretarybird and Martial Eagle. Flat areas experience sheet runoff and some areas are relatively barren or are 'washes' with low density vegetative cover. Only a few scattered areas are under cultivation. The water bodies noted within the broader area are mostly man-made dams and may support certain red-listed species such as flamingos, large numbers of congregatory species, and potentially provide nocturnal roosting sites for Blue Cranes.

5.13.9 Bats

Approximately nine species of bat can potentially occur at the proposed site (African Chiroptera Report 2018; Monadjem et al. 2010). It is possible that more (or fewer) species may be present because the distributions of some bat species in South Africa, particularly rarer species, are poorly known. Analysis of the acoustic monitoring data suggests that at least five species of bat are present. Recent taxonomic research suggests that the Egyptian free-tailed bat may be at least two separate species (D. Jacobs, pers. Comm, 2020) but is considered as one for the purposes of this report and until its taxonomic status is clarified further.

For foraging bats, one of the most important ecological constraints is clutter; objects (e.g. vegetation) that have to be detected and avoided by bats during flight (Schnitzler and Kalko 2001). Clutter presents perceptual and mechanical problems for bats. Perceptually, bats are constrained by their sensory capabilities to find prey amongst clutter (e.g. having an echolocation system adapted to find prey in dense vegetation versus in the open). Mechanically, bats are constrained by their flight ability (e.g. adaptations in wing morphology that enable flight in dense vegetation versus in the open). Habitats can therefore be defined according to clutter conditions. These include uncluttered space (open spaces, high above the ground and far from vegetation), background cluttered space (near the edges of vegetation, in vegetation gaps, and near the ground or water surfaces), and highly cluttered space (very close to surfaces such as leaves or the ground). Habitat complexity is therefore an important consideration for bats because areas that offer a variety of clutter conditions are more likely to support a greater diversity of bat species. The relative uniformity of the landscape, with a limited degree of clutter complexity, will reduce the diversity of species present on the site. Despite this, there is a range of suitable habitat for bats that can be used for roosting, foraging and commuting in the study area.

The availability of roosting space is a critical factor for bats (Kunz and Lumsden 2003) and a major determinant of whether bats will be present in a landscape, as well as the diversity of species that can be expected. There are no confirmed roosts in the study area. Based on unpublished data from the South African Bat Assessment Association, the nearest major bat roost is located ca. 93 km north of the site. There are however, several potential roosting features on site that may be used by bats. These include buildings and trees (which are mainly associated with the farmsteads) and rocky outcrops. A number of bat species can make use of rocky crevices (Monadjem et al. 2010) and others, such as the Cape serotine and Egyptian free-tailed bat, readily make use of buildings as roosts (Monadjem et al. 2010). There do not appear to be any large caves in the study area which suggests that there may not be large colonies of bats however several hundred bats may occupy building roosts in the study area. Investigations of rocky outcrops did not reveal any signs of roosting bats.

Water sources are important for bats as a direct resource for drinking and because these areas tend to attract insects and promote the growth of vegetation (e.g. riparian vegetation). Therefore, besides providing drinking water, bats can also be attracted to water sources as potential foraging and roosting sites (Greif and Siemers 2010; Sirami et al. 2013). There are numerous wetlands, reservoirs and farms dams in the study area that will be attractive to bats. Rivers, and drainage lines will be equally important for foraging and commuting. Some of these water resources are non-perennial because of the arid nature of the site, and therefore only available to bats during some parts of a year. This could then restrict potential impacts to bats to periods when key resources are available. Limited areas of cultivation areas are present near farmsteads which are important foraging areas as some species forage over agricultural fields to hunt insect pests (Noer et al. 2012; Taylor et al. 2011). Bats are known to use linear landscape features for commuting routes to get to and from foraging sites, roost sites and to access water sources. Linear landscape elements, such as tree lines and edge habitats, provide protection to bats from predators, shelter from wind, orientation cues as well as foraging habitat (Verboom and Huitema 1997; Verboom 1998). The primary linear landscape features are drainage lines which typically (but not always) are associated with vegetation, providing linear and edge habitats that bats can access. Rivers, tree lines, and other edge habitats might also be used as commuting routes or navigation cues.

5.13.10 BAT SPECIES OF CONSERVATION CONCERN

Table 5-2: Bat Species List for the Soyuz WEF Cluster and their Sensitivity

Species	Species Code	# Bat Passes	Conservation Status[1]		Likelihood of Risk
			National	International	
Egyptian free-tailed bat *Tadarida aegyptiaca*	TADAEG	273,803	Least Concern	Least Concern	**High**
Roberts's flat-headed bat *Sauromys petrophilus*	SAUPET	480	Least Concern	Least Concern	**High**
Cape serotine *Neoromicia capensis*	NEOCAP	44,807	Least Concern	Least Concern	**High**
Zulu Pipistrelle Bat *Neoromicia zuluensis*	NEOZUL	117	Least Concern	Least Concern	**High**
Straw-coloured Fruit Bat *Eidolon helvum*	EIDHEL	-	Least Concern	Near Threatened	**High**
Long-tailed serotine *Eptesicus hottentotus*	VES30	4,858	Least Concern	Least Concern	**Medium**

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

Species	Species Code	# Bat Passes	Conservation Status[1]		Likelihood of Risk
			National	International	
Yellow-bellied house bat *Scotophilus dinganii*			Least Concern	Least Concern	**Medium-High**
Lesueur's wing-gland bat** *Cistugo lesueuri*	CISLES	28	Least Concern	Least Concern	**Low**
Darling's horseshoe bat *Rhinolophus darlingi*	RHIDAR	-	Least Concern	Least Concern	**Low**
Geoffroy's horseshoe bat *Rhinolophus clivosus*	RHICLI	4	Least Concern	Least Concern	**Low**
Egyptian slit-faced bat *Nycteris thebaica*	NYCTHE	-	Least Concern	Least Concern	**Low**
Natal long-fingered bat *Miniopterus natalensis*	MINNAT	586	Least Concern	Least Concern	**High**

5.14 Rivers, Watercourses, and Drainage Lines

5.14.1NFEPA 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 5-8 for a map illustrating the NFEPA Wetlands and Rivers.

5.14.2Drainage and River Ecosystem Context

The proposed windfarm falls within quaternary catchment D61L, associated with the Graafwaterspruit, a tributary of the Ongers River, which falls within the Orange River Water Management Area (WMA). The Graafwaterspruit main channel flows in a westerly, then northerly direction through the WEF boundary. Numerous smaller drainage lines occur across the proposed development area.

According to the NBA (2018), the intersecting reach of the Graafwaterspruit on the western section of the site is classified as Endangered, with a Present Ecological State (PES) of "C: Fair". Endangered ecosystems are ecosystem types that are close to becoming Critically Endangered (Nel & Driver, 2021). Any further loss of natural habitat or deterioration of condition in these ecosystem types should be avoided, and the remaining healthy examples should be the focus of conservation action (Nel & Driver, 2021). The reaches of the Graafwaterspruit along the south of the site are considered to be Least Threatened, with a "Data Deficient" PES allocations. Much of the Karoo was largely under-sampled during the NBA (2018) assessment.

In terms of the National Freshwater Ecosystem Priority Areas (NFEPA) project (2014), sections of the Graafwaterspruit and Ongers are categorised as Upstream Management Areas. These are sub-

quaternary catchments in which human activities need to be managed to prevent degradation of downstream river FEPAs and Fish Support Areas.

5.14.3 Wetland Ecosystem Context

According to the National Wetland Map Version 5 (2018), 12 wetlands fall within the WEF boundary, all of which are valley-bottom associated with rivers, with an additional four rivers within 500 m of the boundary. All of these lack a threat status classification. There are also seven artificial wetlands within the WEF boundary and an additional five within 500 m of the boundary, all of which are classified as dams. Although no NFEPA wetland clusters fall within 500 m of the WEF boundary, several occur approximately 10-20 km to the north.

Table 5-3 : Generalised categorisation of assessment units

CATEGORY	SUBCATEGORY	DESCRIPTION
Washes	Longitudinal (A01-07)	Wash features derived from high order drainage, dominated by active transportation and deposition of sediment via sheet overland flow, i.e. without active channelling, or with only localised, discontinuous and weakly-defined channelling in their natural condition. Occurs along the valley floor. Evidence of longitudinal, down-valley sheet flow. May or may not include localised seepage areas, supporting limited hydric conditions. Common within the Soyuz 1 WEF and broader cluster study area. In their impacted state, these washes are characterised by networks of deeply-incised erosion gullies, resembling Badlands. According to a local farmer, much of this erosion occurred during the floods of 1988. More extensive gully networks have been targeted for erosion control, which includes a series of concrete weirs.
	Lateral (B01-04)	Wash features derived from lower order drainage, dominated by active transportation and deposition of sediment via sheet overland flow, i.e. without active channelling, or with only localised, discontinuous and weakly-defined channelling. Occurs along mesa foot slopes, often coalescing and joining longitudinal washes at or near the valley bottom, giving the appearance of fans. Evidence of lateral, down-slope sheet flow. May or may not include localised seepage areas, supporting limited hydric conditions. Few occurring along mesas within the Soyuz 1 WEF and broader cluster study area.
Flats	Lowland (C01-05) and Pans (C06)	Brackish flats, typically occurring within unchannelled lower order drainage areas. Bare or sparsely vegetated by salt tolerant species. Common within the Soyuz 1 WEF study area. Pans are a subtype of the lowland flats, sometimes occurring within the broader boundary of the flat. These are more-or less round flat basins, completely devoid of vegetation, typically fringed by sparse salt tolerant vegetation. Only a one lowland pan was noted within the Soyuz 1 WEF and few within the broader cluster study area.
	Mesa-top (D01-08)	Shallow soil flats occurring at the top of mesas, dominated by *Cyperus* sp. and short grass. Lacking hydric conditions. Notable disturbance of soils in some mesa-top flats, assumed to be caused by porcupines. Few occurring on mesas within the Soyuz 1 WEF and broader cluster study area.

CATEGORY	SUBCATEGORY	DESCRIPTION
Low-order drainage lines	Unchannelled (E01)	Gently-sloped, topographically-defined areas of ephemeral flow accumulation, rarely supporting any hydric conditions. Lacking a well-defined channel. Somewhat common within the Soyuz 1 WEF and broader cluster study area.
	Channelled (F01-14)	Steep- or moderately- sloped channelled ephemeral drainage lines, occasionally supporting localised hydric conditions. Occurs on steep upper slopes of mesas, characterised by cobble and boulder channel beds, or on more gradual mid-slopes where channels have become accentuated by livestock tracks. The more mesic conditions are associated with mesa runoff. These are also in the best condition, vegetated by *Heteropogon contortus* and *Themeda triandra.* Somewhat common within the Soyuz 1 WEF and broader cluster study area. Channelled drainage lines typically lose confinement near the base of the mesas. Depending on the shape of the receiving basin, sediment either converges or diverges, forming an alluvial fan of deposition. These alluvial fans often overlap with lateral washes.
Artificial wetlands	Dam	Dams, characterised by an earthen, typically vegetated, or concrete dam wall. Evidence of impounded water, including generally bare or sparsely vegetated areas, with either open water or cracked, moist or dry, clayey surfaces. Often accompanied by windmills, pumps and/or livestock water troughs. Some support hydric soils, as well as aquatic and/or wetland vegetation. Somewhat common within the Soyuz 1 WEF and broader cluster study area.
Perennial Rivers		Mixed alluvial and bedrock active perennial rivers, with gentle to moderate flow, seasonal pools and often algae, especially downstream of high grazing areas. The perennial rivers are presumably fed by natural springs. No perennial rivers were noted within the Soyuz 1 study area. However, a number of rivers were noted within the broader WEF cluster, particularly to the south.

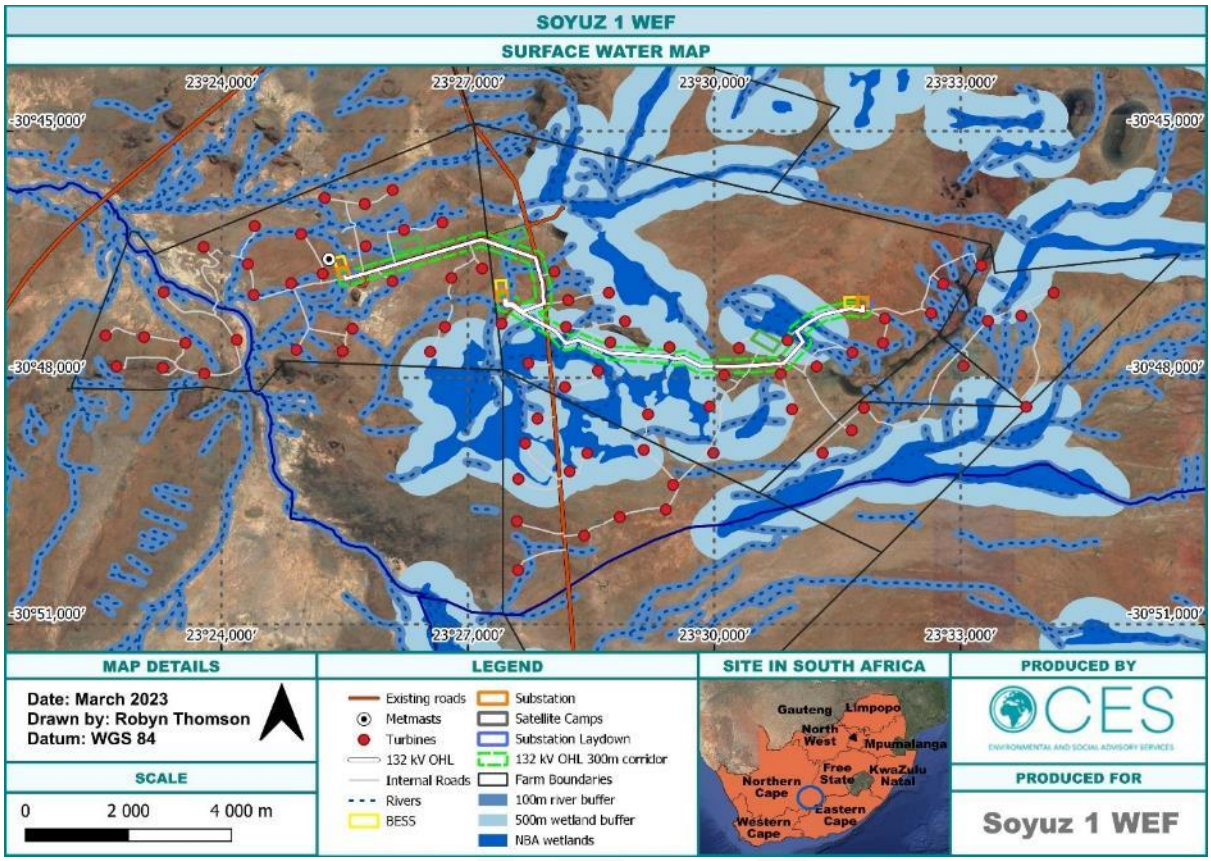


Figure 5-8: Surface Water Map of the Soyuz 1 WEF site and surrounding areas.

6 DESCRIPTION OF THE ENVIRONMENT: SOCIO-ECONOMIC

6.1 BACKGROUND INFORMATION: NORTHERN CAPE PROVINCE, EMTHANJENI LOCAL MUNICIPALITY, AND THE PROJECT SITE

The Northern Cape Province is the largest province in South Africa, covering approximately 372 889 m^2 and constituting about 30% of South Africa's land area. The province is also the most sparsely populated in the country, with its population constituting approximately 2.2% of South Africa's total population. It lies to the south of its most important asset, the Orange River, which provides the basis for a healthy agricultural industry. The province shares borders with four other provinces, namely the Free State, Northwest, Eastern Cape and Western Cape. It also shares borders with Namibia and Botswana to the north. The Atlantic Ocean forms the western boundary. The climate in the province is typically very warm in summer in most areas and very cold in winter. Unemployment has increased significantly between 1996 and 2011 (StatsSA, 2011 Provincial Profile – Northern Cape).

The key contributors to economic growth in the province are mining, construction, finance, utilities (including a growing renewable energy sector) and agriculture. The province contributes the least to the National GDP of all provinces (http://www.northern-cape.gov.za/).

The province is divided into five districts, namely Namakwa, Pixley ka Seme, Siyanda, Frances Baard, and John Taolo Gaetsewe. Emthanjeni LM, the local municipality within which the project site falls, is one of eight local municipalities in Pixley ka Seme District, and comprises the towns of Britstown, De Aar and Hanover, with the administrative seat being in De Aar.

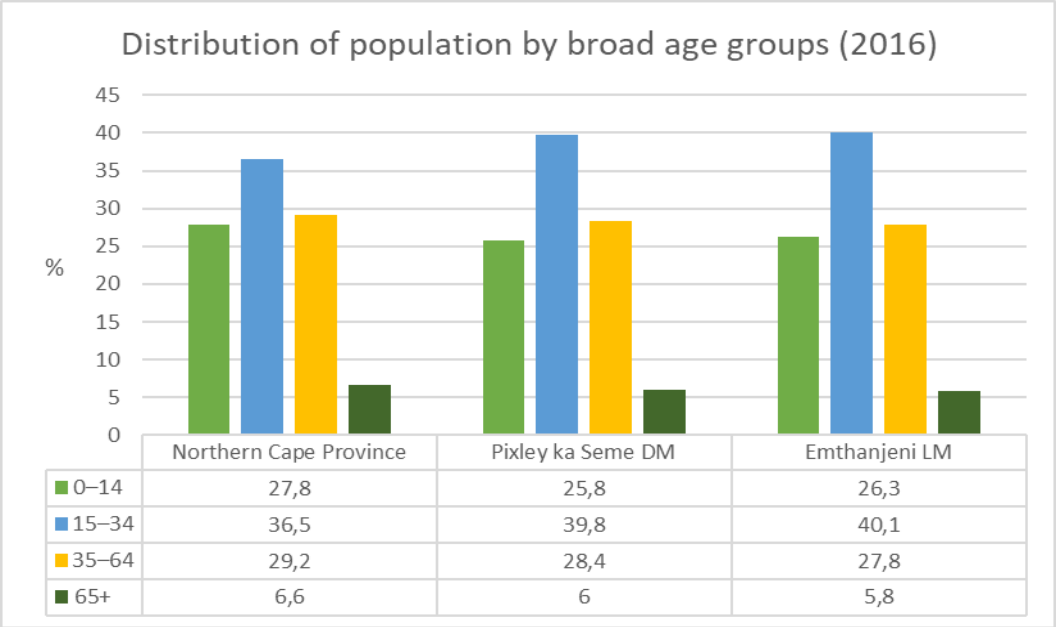
According to Emthanjeni LM's IDP 2021/2022, Agriculture forms the backbone of Emthanjeni's economy, and it is the largest contributor to labour/employment currently. Sheep (for wool and mutton), game, lucerne and wheat farming are the main farming activities in the area. The area is known for supplying Karoo mutton, with the largest abattoir in the southern hemisphere reportedly located in De Aar. The IDP also describes the municipality as being a potential industrial growth point, with investments in the form of renewable energy, manufacturing and warehousing projects. The Manufacturing sector shows potential of growth through the introduction of renewable energy projects in De Aar and surrounding areas. The Municipality is dependent upon the following economic activities: Services sector (government institutions, NGOs, banks), Manufacturing (stone crushers, brick manufacturing, renewable energy generation, meat processing), Retail (including various chain stores), Agriculture, Transport (rail and road infrastructure), and Tourism.

The project site is located south of Britstown and consist of various farms located outside the urban areas of the municipality. From aerial imagery it is not clear whether any homesteads will be affected by the proposed WEF; this will be determined during the field work in the EIA phase.

6.2 DEMOGRAPHICS

6.2.1 STRUCTURE OF THE POPULATION BY BROAD AGE GROUPS

The age profile for Emthanjeni LM is similar to that of Pixley ka Seme District and the Northern Cape Province, with the majority of residents falling in the age group 15–34 years, followed by 35–64 and 0–14 years. The smallest number of residents fall in the age group 65+ years.

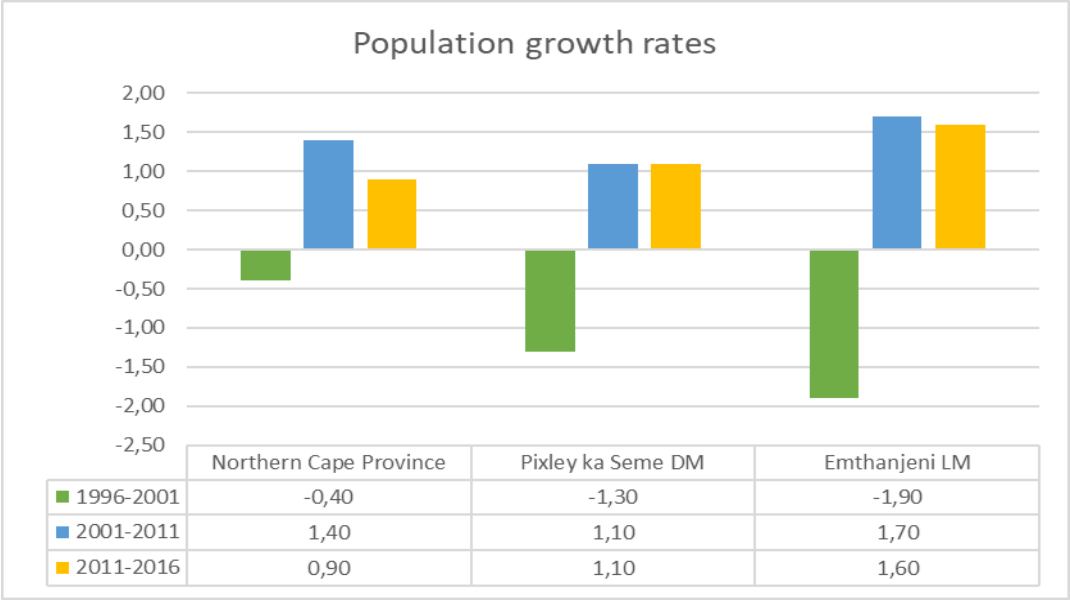


	Northern Cape Province	Pixley ka Seme DM	Emthanjeni LM
0–14	27,8	25,8	26,3
15–34	36,5	39,8	40,1
35–64	29,2	28,4	27,8
65+	6,6	6	5,8

Figure 6-1: Population broad age groups.

6.2.2 POPULATION GROWTH RATES

The Northern Cape Province, Pixley ka Seme District and Emthanjeni LM all had negative growth rates between the period 1996–2001. This changed after 2001, with positive growth rates being recorded for the province, district and municipality for the periods 2001–2011 and 2011–2016.



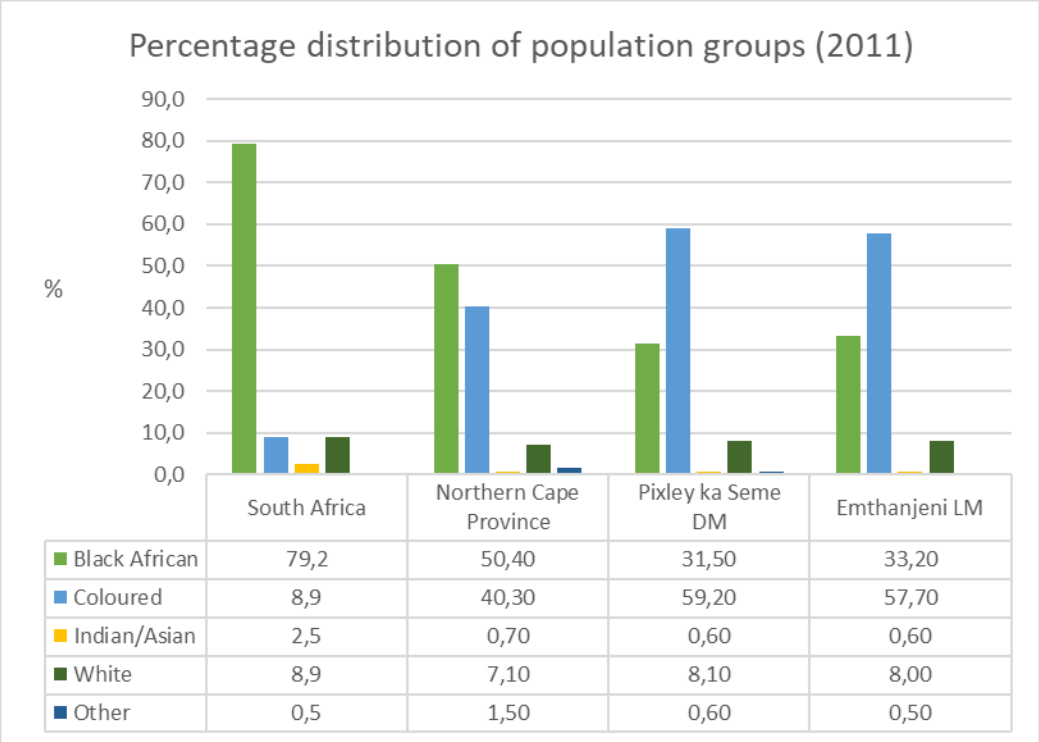
	Northern Cape Province	Pixley ka Seme DM	Emthanjeni LM
1996-2001	-0,40	-1,30	-1,90
2001-2011	1,40	1,10	1,70
2011-2016	0,90	1,10	1,60

Figure 6-2: Population growth rates.

According to the StatsSA 2016 Community Survey, the Northern Cape also has the smallest percentage of residents who were born outside South Africa, namely 1.1%, compared to 50.8% in Gauteng and 12.2% (the second highest percentage in the country) in the Western Cape. Of the residents of Pixley ka Seme DM who were born outside South Africa, 50.5% were born in one of the SADC countries, 10.5% were born elsewhere in Africa, 6.3% were born in Europe, 31.5% were born in Asia, 1.3% were born in North America, and none were born in the remaining continents.

6.2.3 POPULATION GROUPS

The population distribution for the district and local municipality differs from that of the country and the province—in South Africa and the Northern Cape Province, the dominant population group is Black African, whereas in Pixley ka Seme DM and Emthanjeni LM it is Coloured. The proportion Coloured residents in the province, however, does not reflect that of the country as a whole, with their distribution in the province being much higher in the province than in the country. On all levels (National, Provincial, District and Local), Whites are the third most prevalent, with the lowest number of residents on all levels being Indian/Asian.



	South Africa	Northern Cape Province	Pixley ka Seme DM	Emthanjeni LM
Black African	79,2	50,40	31,50	33,20
Coloured	8,9	40,30	59,20	57,70
Indian/Asian	2,5	0,70	0,60	0,60
White	8,9	7,10	8,10	8,00
Other	0,5	1,50	0,60	0,50

Figure 6-3: Percentage distribution of population groups (2011).

6.2.4 RELIGIOUS AFFILIATION

In terms of religious affiliation, the majority of residents (96%) of the Northern Cape Province are Christian, followed by no religious affiliation/belief (2%), Traditional African Religion (1%) and Muslims (1%).

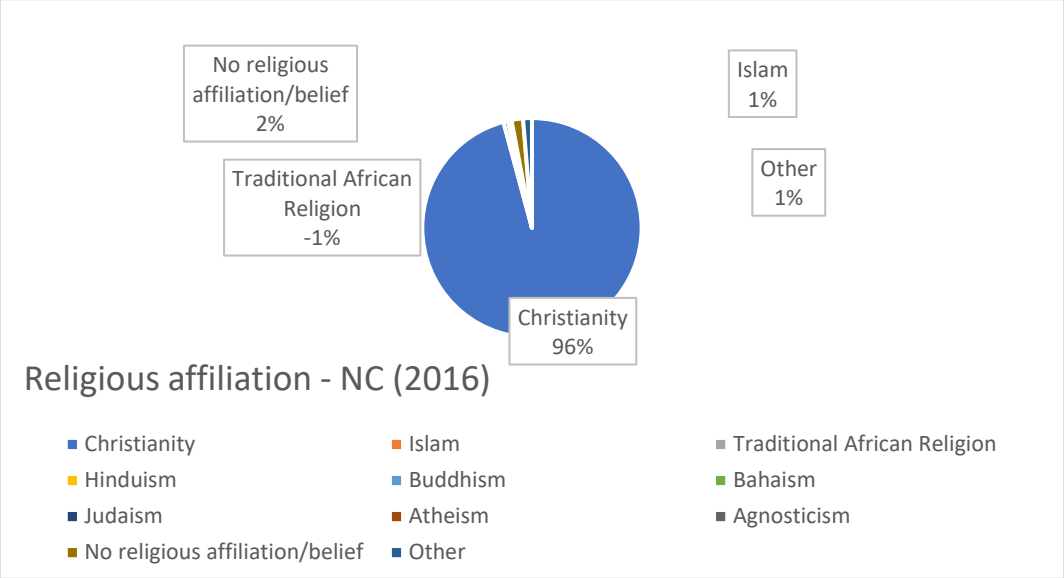


Figure 6-4: Percentage religious affiliation.

6.2.5 Occurrence of deaths in households

The occurrence of deaths in households was higher in Emthanjeni LM than in the District or Province, in the 12 months preceding the Community Survey that took place in 2016. 3.4% of households in the Northern Cape had deaths in their households during the 12-month period, while 4.7% of households in the Pixley ka Seme District and 5.1% of households in Emthanjeni LM had deaths in their households.

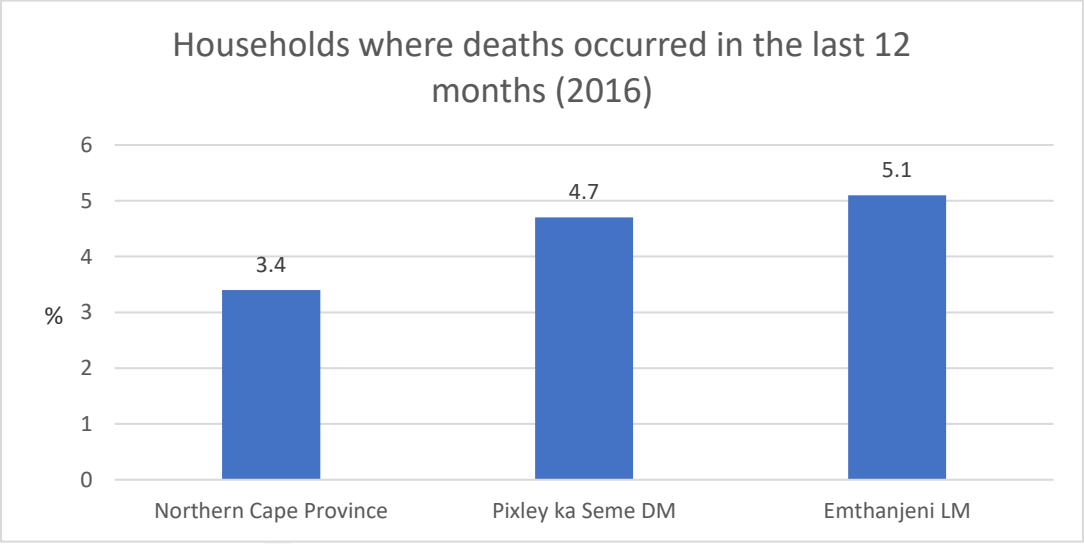
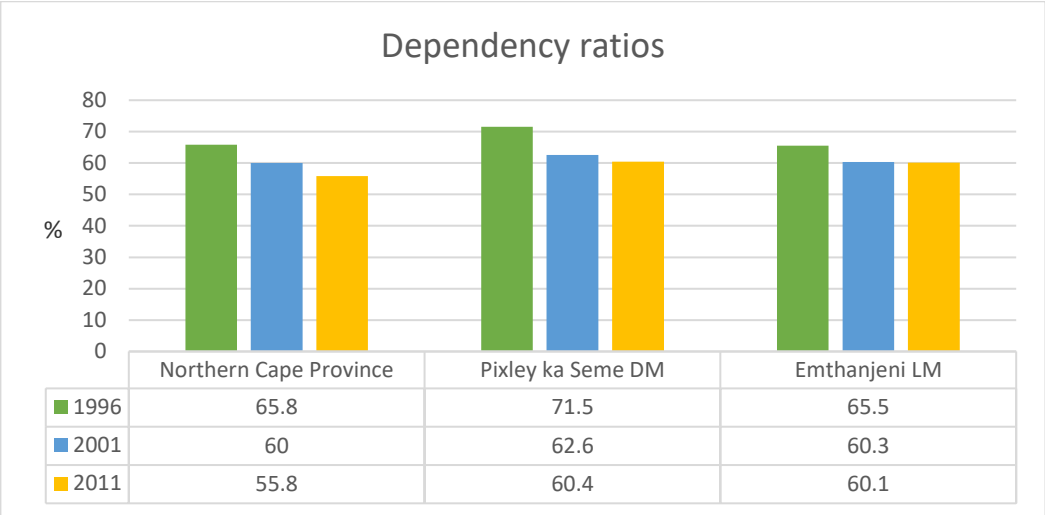


Figure 6-5: Household deaths over 12 months (2016).

6.2.6 Dependency ratios

Dependency ratios indicate to what extent the working age group (15–64 years) of a population has to support those aged 0–14 years and 65+ years.



	Northern Cape Province	Pixley ka Seme DM	Emthanjeni LM
1996	65.8	71.5	65.5
2001	60	62.6	60.3
2011	55.8	60.4	60.1

Figure 6-6: Dependency ratios.

Emthanjeni LM's dependency ratio decreased slightly between 2001 and 2011, with larger decreases seen in the province and district.

6.2.7 EDUCATION

The highest percentage of residents older than 20 years residing in Emthanjeni LM has completed some secondary education, followed by those who completed Grade 12/Std 10, some primary, no schooling, completed primary, and higher. This is similar to levels for the district and province, except that a larger percentage of residents in the province completed some primary education than those completing Grade 12/Std 10. There are only slight differences for highest level of education completed between males and females.

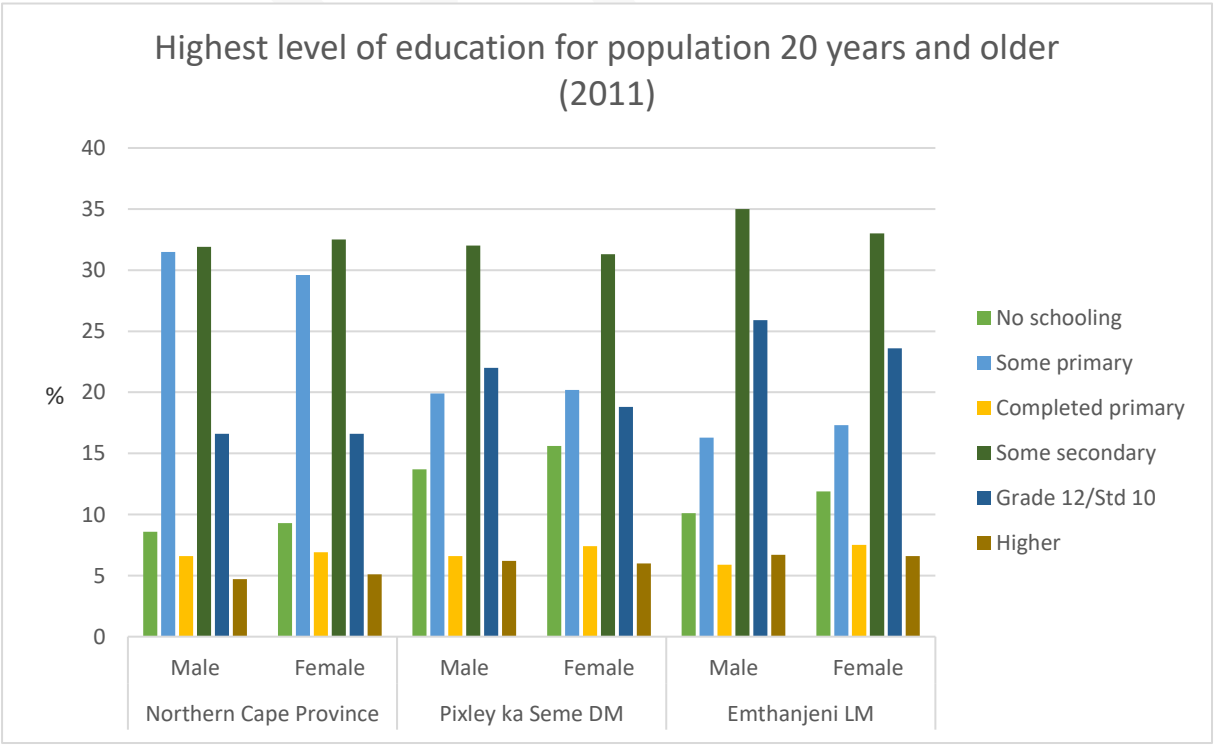
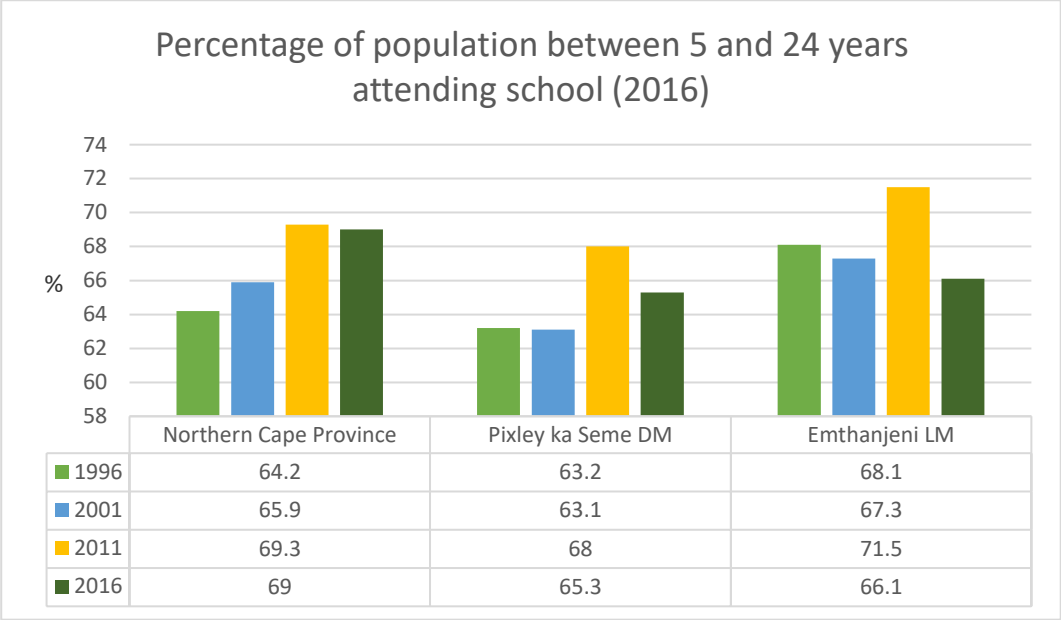


Figure 6-7: Highest level of education for population 20 years and older (2011).

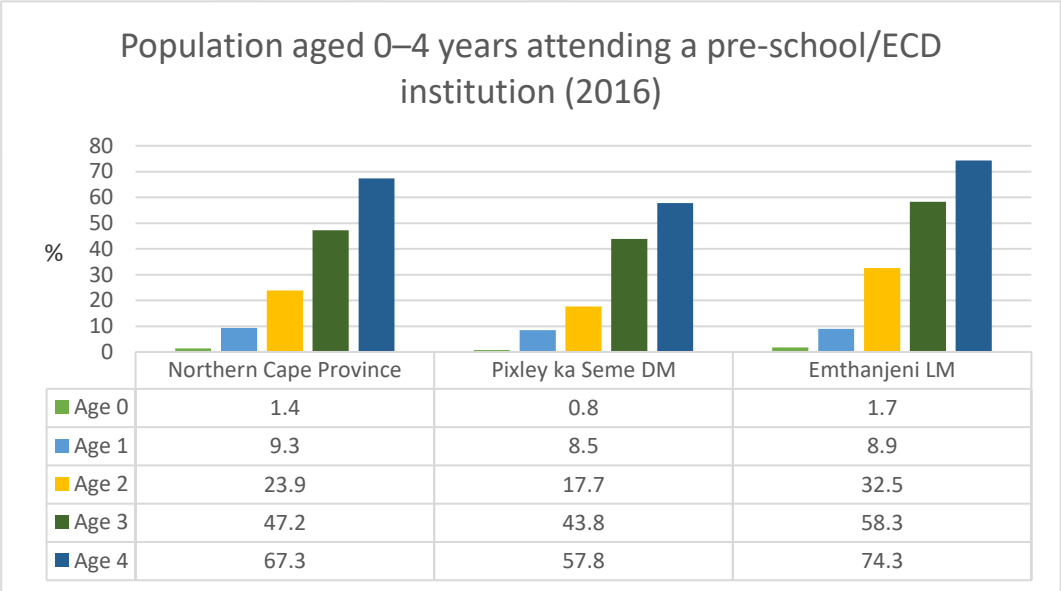
The percentage of the population between the ages of 5 and 24 years attending school has decreased between 2011 and 2016, after having shown an increase in the period 2001–2011. This was the case in the province, district and local municipality.



	Northern Cape Province	Pixley ka Seme DM	Emthanjeni LM
1996	64.2	63.2	68.1
2001	65.9	63.1	67.3
2011	69.3	68	71.5
2016	69	65.3	66.1

Figure 6-8: Percentage of population between 5 and 24 years attending school (2016).

Attendance of pre-school or Early Childhood Development (ECD) institutions increased with age in the province, district, and local municipality, with almost three quarters (74.3%) of children aged 4 attending in Emthanjeni LM.

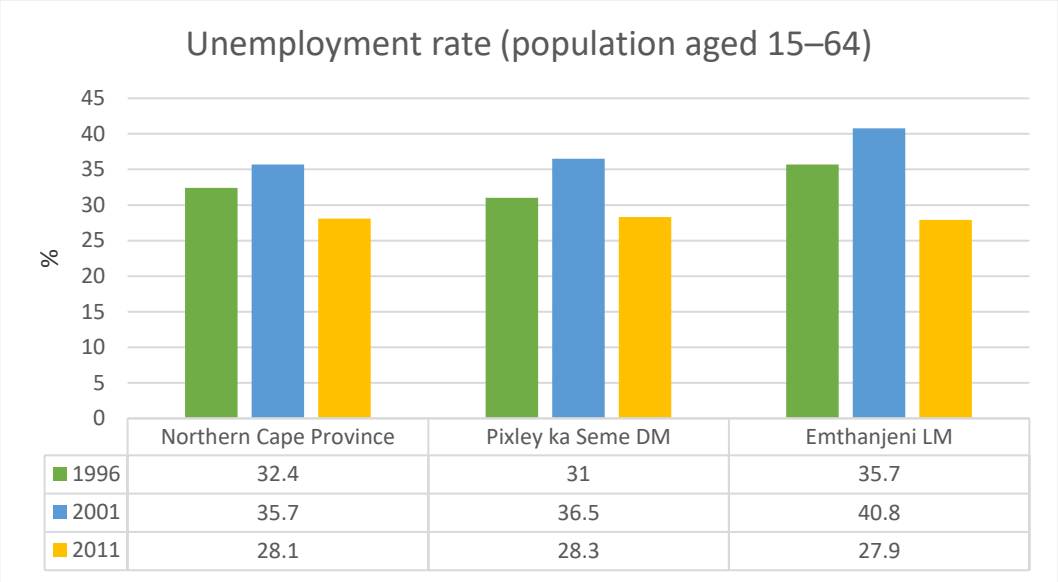


	Northern Cape Province	Pixley ka Seme DM	Emthanjeni LM
Age 0	1.4	0.8	1.7
Age 1	9.3	8.5	8.9
Age 2	23.9	17.7	32.5
Age 3	47.2	43.8	58.3
Age 4	67.3	57.8	74.3

Figure 6-9: Population aged 0–4 years attending a pre-school/ECD institution (2016).

6.2.8 LABOUR MARKET, INCOME, AND ABILITY TO BUY FOOD

The unemployment rate decreased in the province, district and local municipality between 2001 and 2011. However, these figures are dated and realistically speaking likely much higher, with a significant increase between 2011 and 2022 expected. The employment figures contained in the Emthanjeni Local Municipality IDP 2021/2022 is unfortunately also from the 2011 census. Figures in in the province and municipality will likely follow the same trajectory as national figures, which increased significantly from around 24% in 2011 to 35.3% in the fourth quarter of 2021. The increase in the unemployment rate from 2020 to 2021 was steeper than between 2011 and 2020, likely due to the impact of Covid-19 and accompanying lockdowns which resulted in businesses closing and employees losing their jobs.



	Northern Cape Province	Pixley ka Seme DM	Emthanjeni LM
1996	32.4	31	35.7
2001	35.7	36.5	40.8
2011	28.1	28.3	27.9

Figure 6-10: Unemployment rate (population aged 15–64).

The average yearly income in Emthanjeni LM was R88 244.00 (translating to R7 354.00 per month) in 2011—slightly higher than the provincial average and significantly higher than the district average, which was R75 237.00.

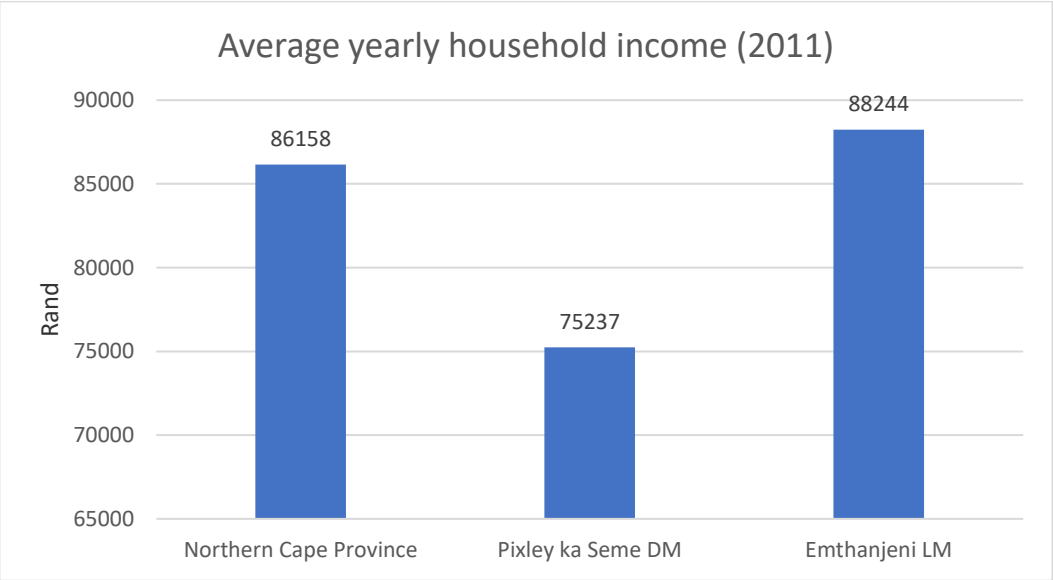


Figure 6-11: Average yearly household income (2011).

Almost a quarter of households (24.9%) in Emthanjeni LM ran out of money to buy food at some point during the 12 months preceding the Community Survey conducted by StatsSA in 2016. This was lower than the provincial and district figures, that were 27.6% and 28.7% respectively.

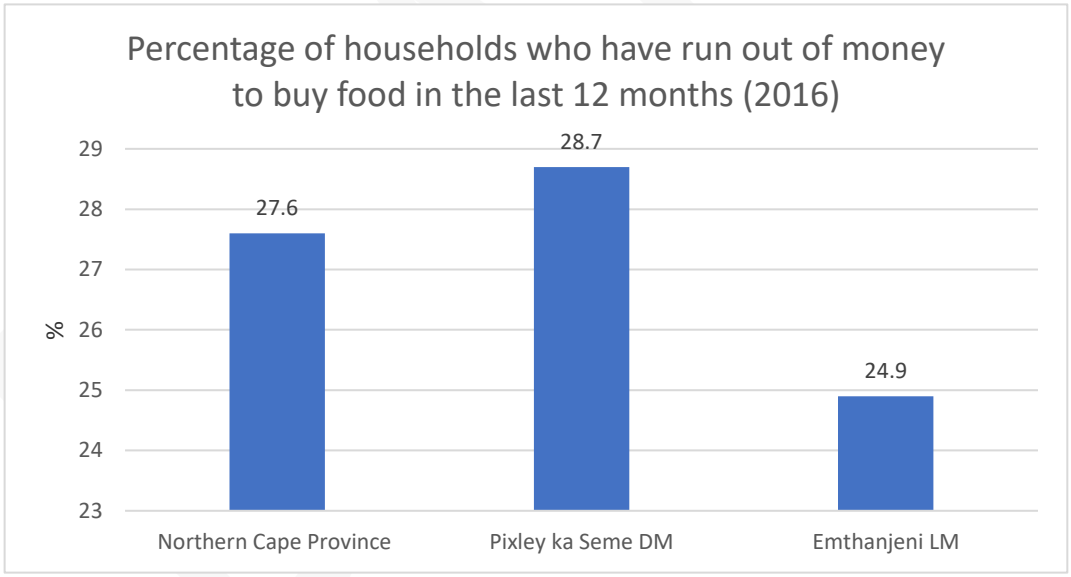


Figure 6-12: Average yearly household income (2011).

The percentage of households in the LM who skipped a meal in the 12 months preceding the 2016 Community Survey because they did not have enough food for the household, were also lower (13.4%) than the figures for the province (17.5%) and district (17.2%).

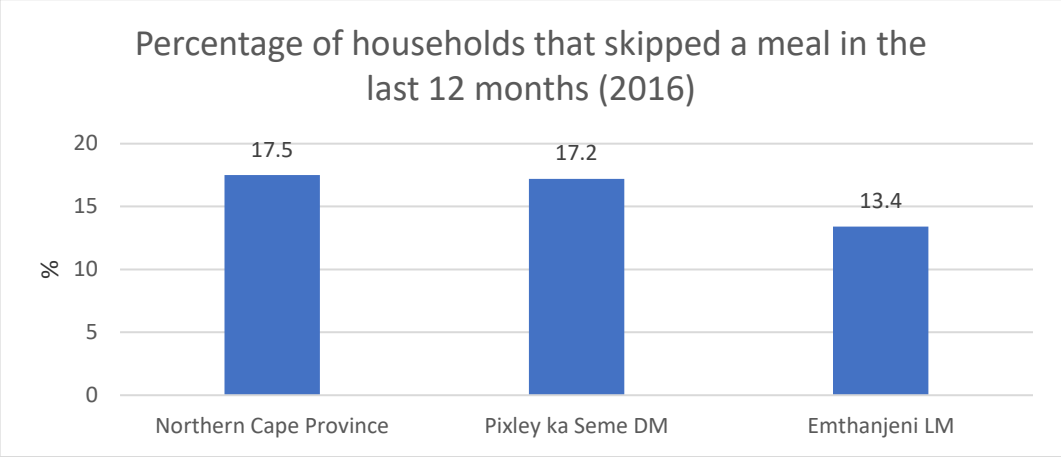
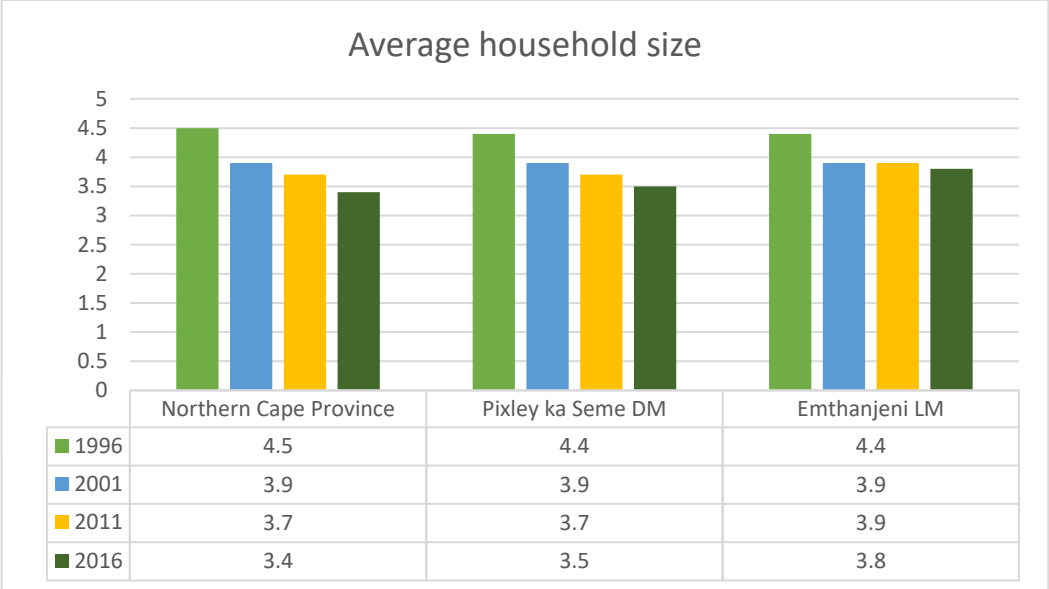


Figure 6-13: Percentage of households that skipped a meal in the last 12 months (2016).

6.2.9 HOUSING

The average household size has decreased slightly across the provincial, district and local municipal levels from 1996 to 2011. The average household size in Emthanjeni LM 3.8 in 2016, whereas it was 3.4 in the province and 3.5 in the district.



	Northern Cape Province	Pixley ka Seme DM	Emthanjeni LM
1996	4.5	4.4	4.4
2001	3.9	3.9	3.9
2011	3.7	3.7	3.9
2016	3.4	3.5	3.8

Figure 6-14: Average household size.

Most residents in the province, district and local municipality live in formal dwellings, with the percentage for Emthanjeni LM being 95.6% in 2016, compared to 83.5% in the province and 89% in the district. The percentage of residents living in informal dwellings was highest in the province (12.8%), followed by the district (9.9%) and the local municipality (4.2%).

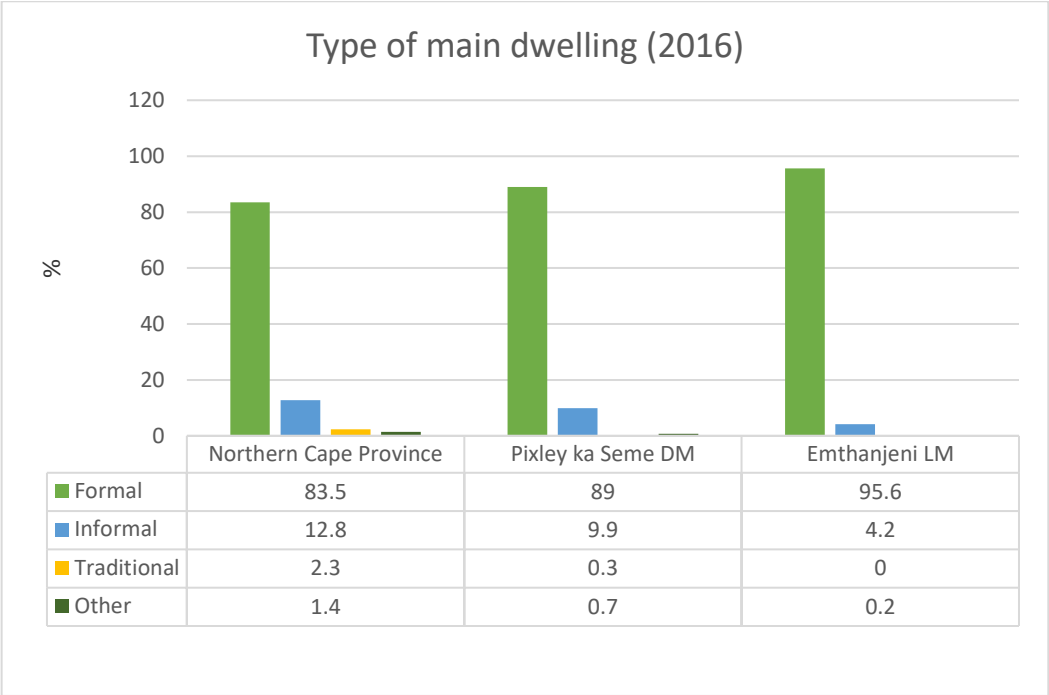


Figure 6-15: Type of main dwelling (2016).

The majority of residents in the province, district and local municipality indicated that their dwellings were owned by them and fully paid off (55.6%, 53.8% and 57.4%, respectively). Figures for dwellings that were occupied rent-free were not available for Emthanjeni LM, but 20.4% and 23.6% of residents in the province and district, respectively, indicated that they were occupying their dwellings rent-free.

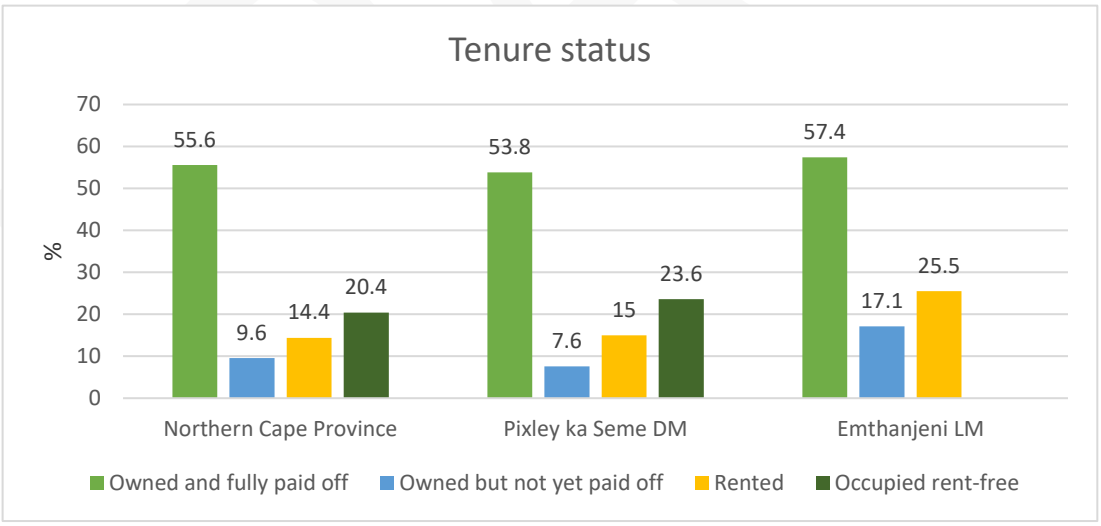


Figure 6-16: Type of main dwelling (2016).

According to the 2016 Community Survey, 43% of residents of Emthanjeni LM were living in RDP houses or other government-subsidised dwellings, followed by 41.4% in the district and 30.1% in the province.

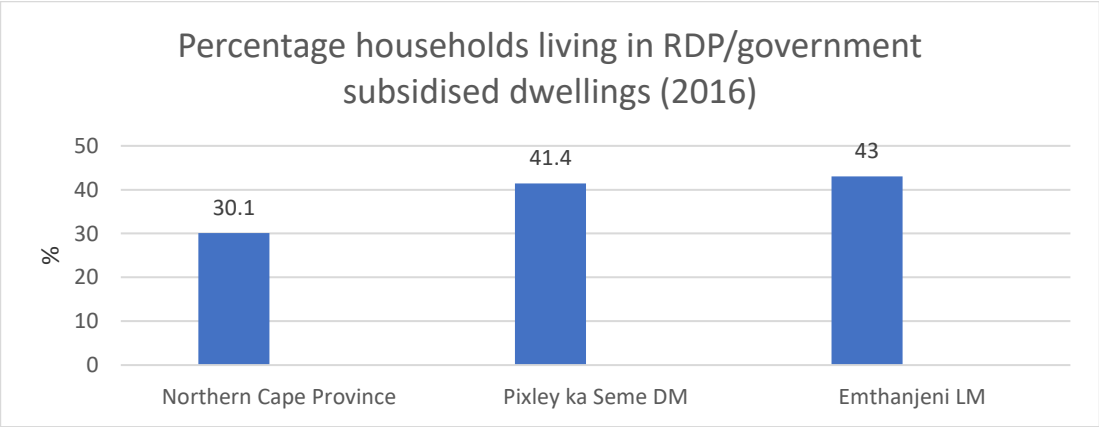


Figure 6-17: Percentage households living in RDP/government subsidised dwellings (2016).

6.2.10 ACCESS TO SERVICES

A majority (93.5%) of residents of Emthanjeni LM indicated in the 2016 Community Survey that they had access to safe drinking water, with 92.5% of residents of Pixley ka Seme District, and 88.5% of residents of the Northern Cape indicating that they did.

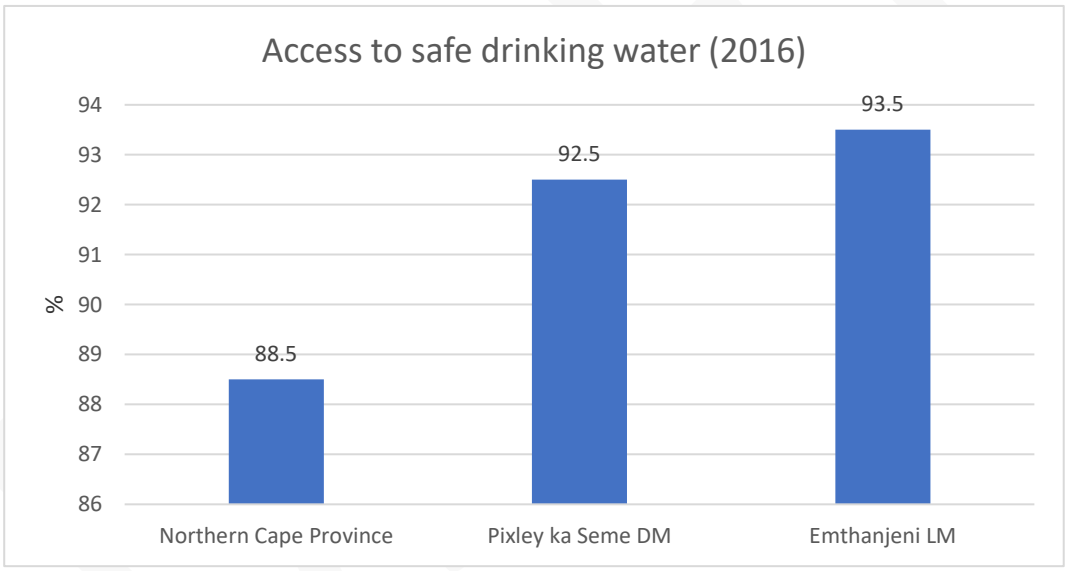


Figure 6-18: Access to safe drinking water (2016).

Almost all (95.6%) residents of Emthanjeni LM indicated in 2011 that they had piped (tap) water inside their dwelling or yard. This was significantly higher than the provincial figure of 79.7% in 2011. Only 0.7% in the LM indicated that they had no access to piped water.

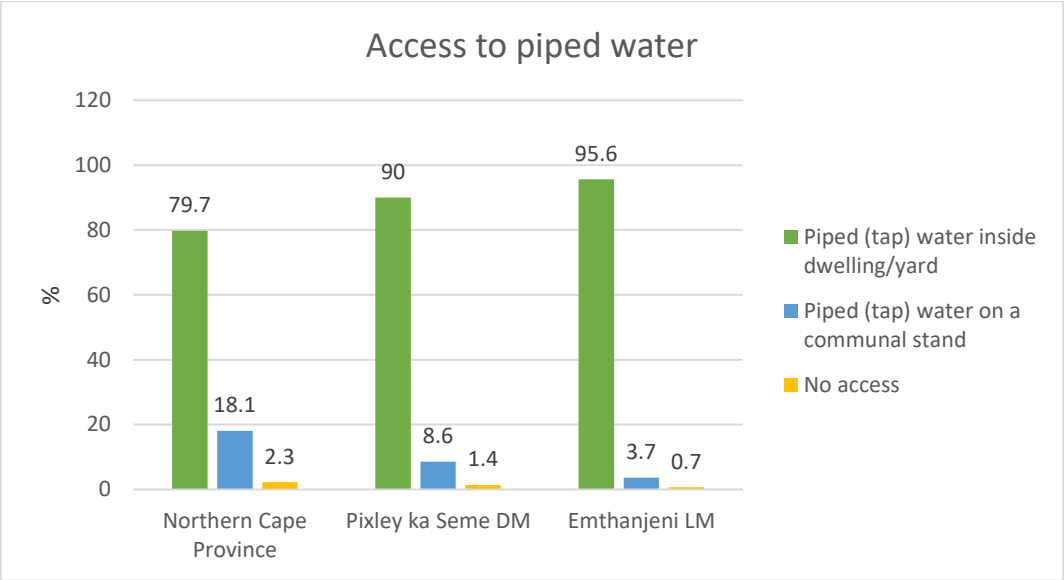


Figure 6-19: Access to piped water.

The majority of residents had access to flush/chemical toilet facilities (86.1% in Emthanjeni LM and 74.3% in Pixley ka Seme District) in 2011. 4.6% used pit latrines and 6.1% used bucket toilets in Emthanjeni LM, and 3.2% indicated that they had no access to any toilet facilities.

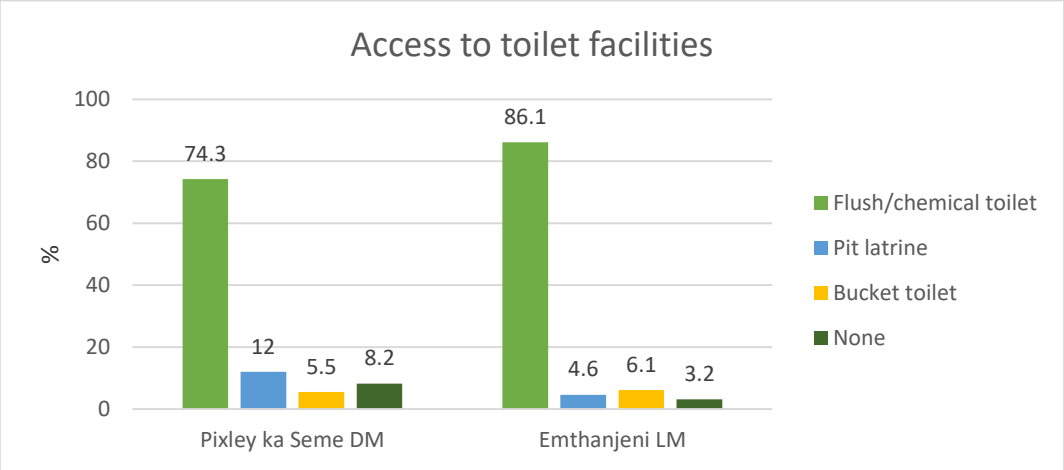


Figure 6-20: Access to toilet facilities.

The percentage of households that had no access to electricity in 2016 was lower in the local municipality (4.5%) than in the district (7.2%) and province (8.5%)

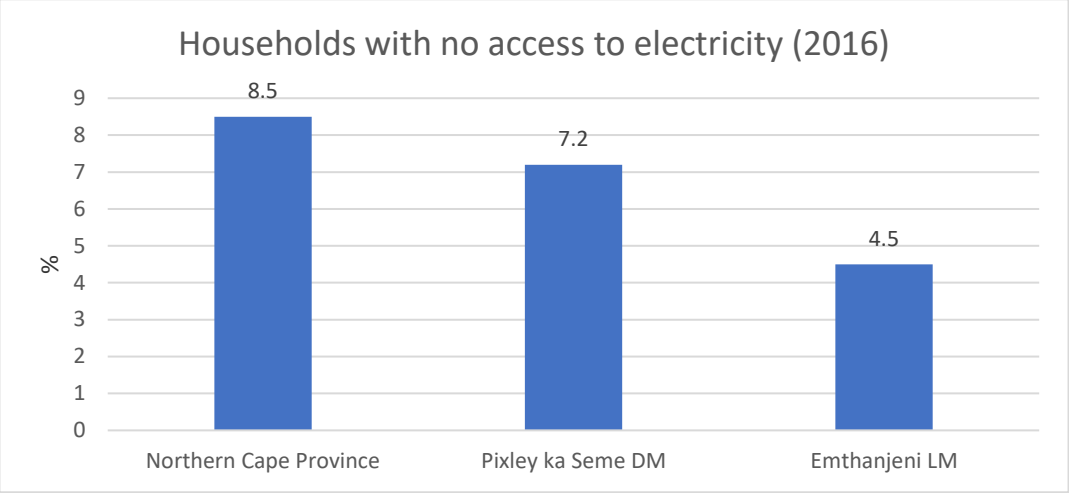
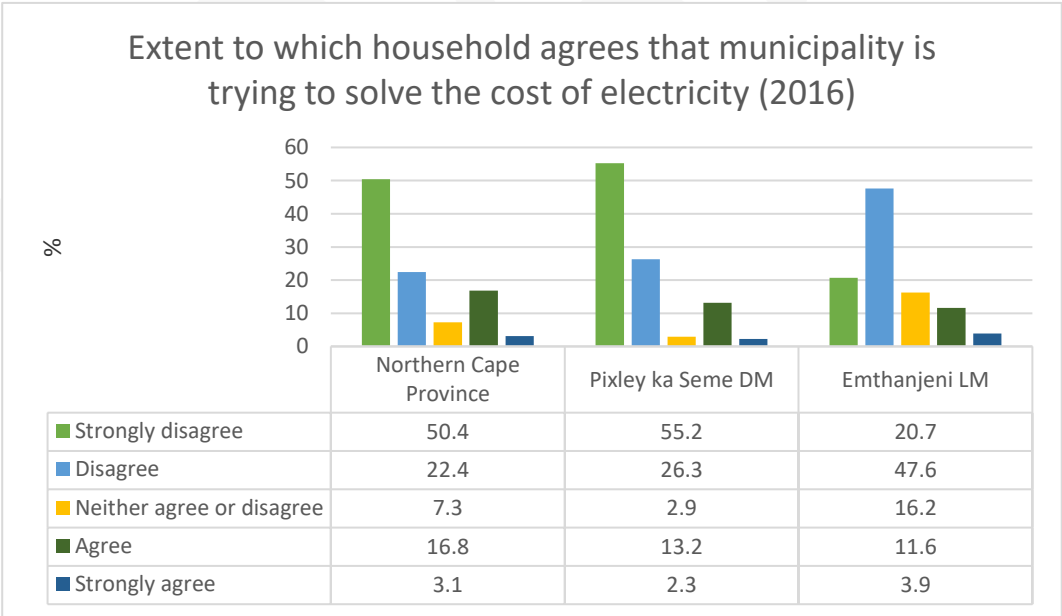


Figure 6-21: Households with no access to electricity (2016).

In terms of the extent to which households agreed that their municipalities were trying to mitigate high electricity costs, the largest percentage of residents who strongly disagreed were in the greater district (55.2%), followed by the province (50.4%) and the local municipality (20.7%), although the lower percentage who strongly disagreed in the local municipality by no means meant that residents did in fact agree, as 47.6% indicated that they disagreed. This may, however, be indicative of a higher level of satisfaction in general with service delivery by the municipality, which would correspond to the more favourable data for the local municipality in terms of access to safe drinking water, piped water, flush/chemical toilets and electricity, compared to the data for the district and province.



	Northern Cape Province	Pixley ka Seme DM	Emthanjeni LM
Strongly disagree	50.4	55.2	20.7
Disagree	22.4	26.3	47.6
Neither agree or disagree	7.3	2.9	16.2
Agree	16.8	13.2	11.6
Strongly agree	3.1	2.3	3.9

Figure 6-22: Extent to which household agrees that municipality is trying to solve the cost of electricity (2016).

6.2.11 FEMALE-HEADED HOUSEHOLDS

The percentage of female-headed households increased from 1996 to 2011 across the province, district and local municipality. Data for 2016 was not available for the local municipality, but it showed a decrease in female-headed households from 2011 to 2016 in both the province and the district.

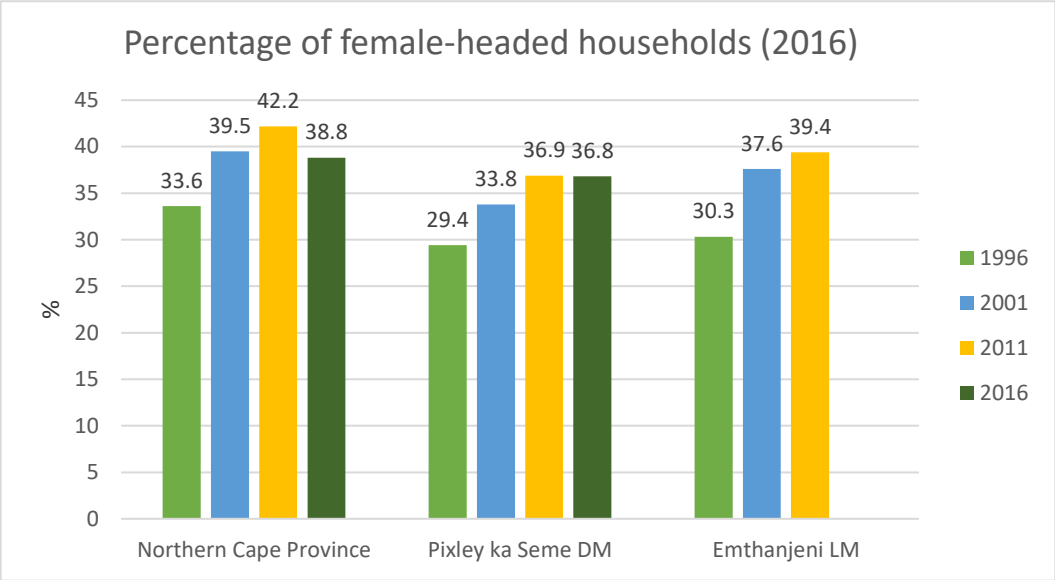


Figure 6-23: Percentage of female-headed households (2016)

6.2.12 CHILD-HEADED HOUSEHOLDS

The percentage of child-headed households decreased in both the province and the district from 1996 to 2011. In the local municipality, however, the percentage child-headed households increased during the same period, with 0.7% of households headed by children.

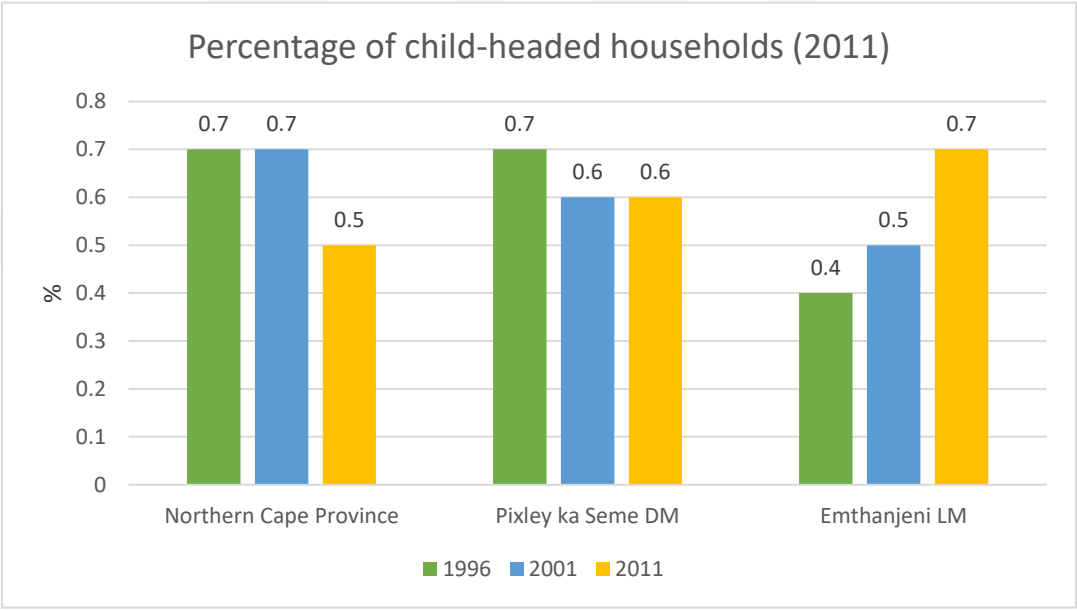


Figure 6-24: Percentage of child-headed households (2011).

6.2.13 CRIME AND PERCEPTIONS OF SAFETY

A lower percentage of households experienced crime in the 12 months preceding the 2016 Community Survey in the local municipality, than in the district and the province as a whole.

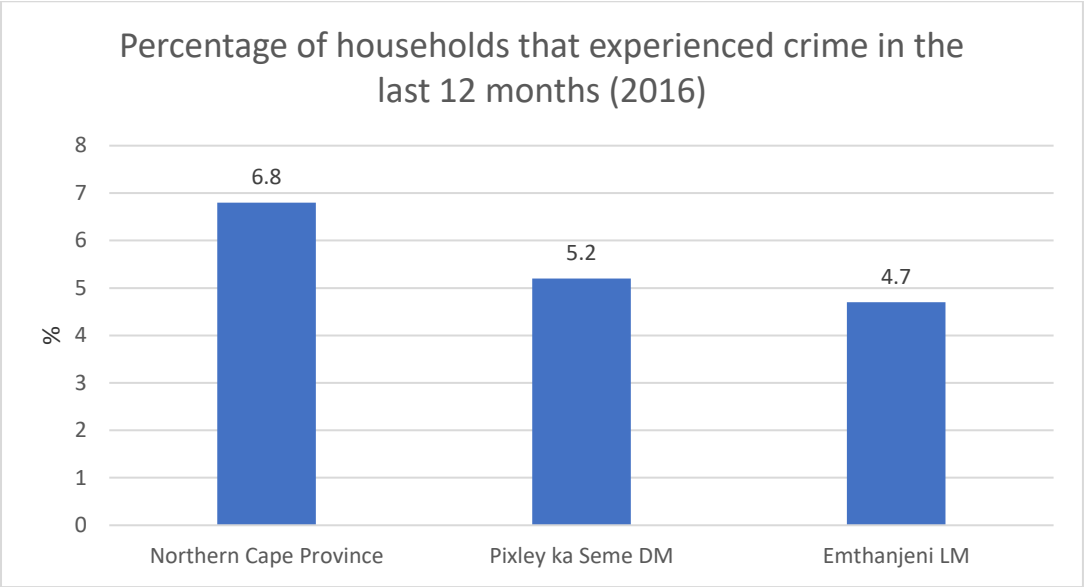


Figure 6-25: Percentage of households that experienced crime in the last 12 months (2016).

In the province, 12.9% of residents indicated that they felt unsafe when walking alone during the day, compared to 7% in the local municipality. These percentages increased significantly when respondents were asked if they felt unsafe when walking alone during the night, with more than half (52.2%) of residents in the province indicating they felt unsafe, and 40.4% of residents in the local municipality indicating they felt unsafe walking alone during the night.

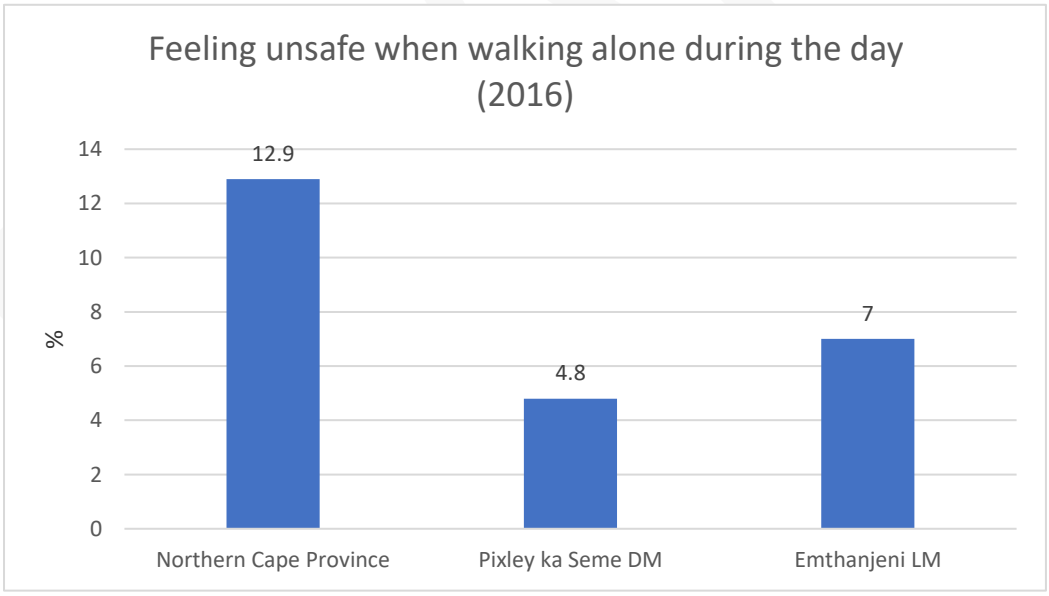


Figure 6-26: Percentage of households that experienced crime in the last 12 months (2016).

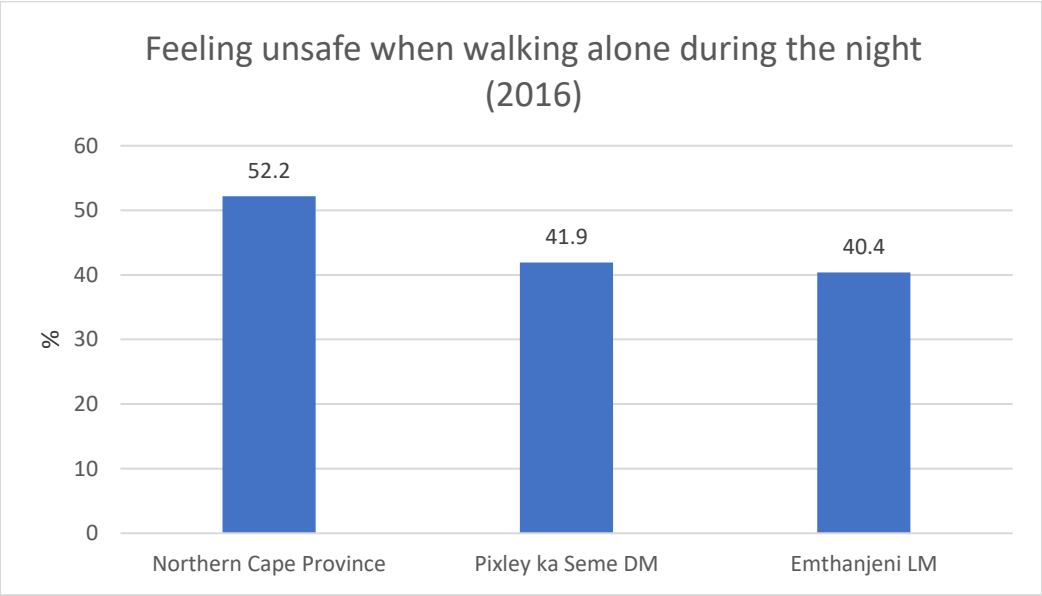


Figure 6-27: Feeling unsafe when walking alone during the night (2016)

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.

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.

7.4 PREFERRED ALTERNATIVE

Based on the assessment of alternatives, the preferred alternative for the Soyuz 1 WEF consists of:

- **Alternative location 1** – Turbines located on the following farms portions which were selected on the basis of good wind resource potential, land availability and the site's proximity to available Eskom electricity grid capacity. The layout takes into account all environmental sensitivities identified during this Scoping and EIR process and avoids highly sensitive areas.

SOYUZ 1 WEF		
SG DIGIT NUMBER	FARM NUMBER/PORTION	AREA (HA)
N073C01200000000144000000	0/144	979
N073C01200000000145000001	RE/145	807
N073C01200000000147000010	1/147	255
N073C01200000000147000060	6/147	1 629
N073C01200000000147000090	9/147	926
N073C01200000000147000110	11/147	3 647
N073C01200000000169000010	1/169	4 893
N073C01200000000169000001	RE/169	3 107
	TOTAL	16243

- **Alternative energy technology 1** – Wind turbines as a preferred technology as a low carbon emitting and renewable energy resource.
- **Alternative layout 1:** Current proposed layout of up to 75 turbine WEF layout, access route, electrical switching stations and connecting powerline.
- **Alternative design 1 –** The following turbine design specifications are proposed:
    - WEF Capacity - Up to 480 MW
    - Number of Turbines - Up to 75
    - Hub Height - Up to 160 m
    - Rotor Diameter - Up to 200 m
    - Blade length - Up to 100 m

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 (Soyuz 1 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 environmental screening, including an avifaunal nest survey, has been performed to identify/avoid potential issues. 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	***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:

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
	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.				▲ 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 Soyuz 1 WEF, were not assessed.
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	**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 Soyuz 1 WEF, as well as the presences of rivers and wetland features in the low lying

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
			▲ Requires more water than wind does ▲ Generates less power per hectare than wind does		flatter areas, present challenges for the development of large scale solar PV. The applicant intends on bidding the projects as part of the wind allocation under the REIPPPP.
	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. This technology would not qualify for REIPPPP.
	Alternative energy technology 4 – Coal fired power plant	▲ None identified	▲ Air pollution from coal dust and smokestack emissions (SO_2). ▲ Contribution to climate change. ▲ Ground contamination from coal dust.	**NO**	Not environmentally desirable and would not qualify for REIPPPP.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
	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.
	Alternative battery storage 1: Solid-state (such as Li-ion (lithium ion)) Battery Technology	▲ High level of energy efficiency. ▲ Relatively high energy density. ▲ Fast response to unpredictable variations in demand and generation. ▲ Low maintenance. ▲ Relatively long lifecycle	▲ Fire risk due to thermal runaway. ▲ High cost due to limited abundance in lithium. ▲ Risk of annual degradation. ▲ Battery protection is required. ▲ Power and energy capacity directly	YES	The technology alternatives which have been considered for the battery storage include solid-state technologies (such as Li-ion), Vanadium Redox Flow and Zinc-Hybrid technologies. Solid-state technology is the preferred alternative and the only technology assessed further in the EIA. Li-ion is currently the most widely used and assessed battery storage technology available.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
		(approximately 10 to 15 years' service life). • Ability to offset grid fluctuations. • Currently the most widely used BESS technology.	coupled (expensive to scale).		
	Alternative battery storage 2: Vanadium Redox Flow Battery Technology	• Fast response to unpredictable variations in demand and generation. • Long life cycle (approximately 20 years' service life). • Almost unlimited energy capacity. • No capacity degradation over time. • Electrolyte is inherently safe and non-flammable. • Independently tuneable power rating and energy capacity.	• Scarce and expensive components (vanadium pentoxide). • Lower level of energy efficiency. • Lower energy density than solid state batteries (such as li-ion). • Require the storage of electrolyte chemicals in tanks for which a Major Hazards Risk Assessment may be required due to storage of hazardous goods. • Requires a larger development	**NO**	

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
			▲ footprint (unless the containers are stacked). ▲ Currently not market competitive.		
	Alternative technology 3: Zinc-hybrid Ion Battery Technology	▲ Relatively low cost. ▲ Among the latest advanced chemistries.	▲ Currently an emerging technology with limited deployment and a lack of available technical information. ▲ Currently not market competitive.	**NO**	
Design or layout This relates mostly to alternative ways in which the proposed development or activity can be physically laid out on the ground to minimise or reduce environmental risks or impacts	**Alternative layout 1:** Preliminary WEF layout, access route, electrical switching stations and short connecting powerline	▲ The preliminary layout consists of up to 75 turbines.	▲ There may be impacts associated with turbine placement and upgrading and expanding road reserves in sensitive environments.	**YES**	Considering the WEF layout: A maximum of 75 turbine structures will be assessed. The preferred layout has been 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 NO-GO areas have been avoided.

ALTERNATIVE LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	COMMENT
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 KEY FINDINGS OF THE SPECIALIST STUDIES

Appropriately qualified and experienced specialists were appointed to undertake the various assessments identified as being necessary. Specialists gathered baseline information relevant to the study and assessed impacts associated with the Soyuz 1 WEF. Specialists have also made recommendations to mitigate negative impacts and enhance benefits. The resulting information has been synthesised in the section below, whilst the full specialist reports have been attached to the EIR as a Specialist Report section in Appendix E.

The following Specialist Studies have been completed for the EIA Phase–

- Agricultural Impact Assessment
- Avifaunal Impact Assessment
- Bat Impact Assessment
- Botanical Impact Assessment
- Freshwater Impact Assessment
- Faunal Impact Assessment
- Heritage Impact Assessment
- Noise Impact Assessment
- Paleontological Impact Assessment
- Socio-Economic Impact Assessment
- Traffic Impact Assessment
- Visual Impact Assessment

All specialists were provided with a Draft Layout to assess. The specialists used various sampling techniques (site visits, desktop analyses, long-term monitoring, short-term monitoring, etc.) in order to assess the Draft Layout. The results gathered from each of the specialists were then assessed by the developer in order to inform the EIR Layout presented in this report. This section summarises the key findings of the specialists on the Soyuz 1 WEF site and their opinion on the design of the layout by the developer to these findings (on the layout presented in this report). The sensitivity analysis, which includes the sensitive areas highlighted by the specialists, is illustrated and assessed in Chapter 10 of this report.

8.1 AGRICULTURAL IMPACT ASSESSMENT

STUDY	**Agriculture Impact Assessment, Appendix E1**
NATIONAL SCREENING TOOL	**HIGH**
SPECIALIST	**Mariné Pienaar**
COMPANY	**TerraAfrica Consult cc**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F1**

8.1.1 CONCLUSION & SPECIALIST STATEMENT

The proposed Soyuz 1 WEF is considered an acceptable development within the Project site that was assessed. The soil profiles classified within the Soyuz 1 WEF Project site consist of the Augrabies, Coega, Mispah, Nkonkoni, Prieska, Swartland and Glenrosa soil form. The largest part of the Soyuz 1 WEF has Very low (Class 02) and Low-Very low (Class 03) Land capability (total-10292.23 ha) and included the Mispah and Coega soil forms respectively. Low-Moderate (Class 07) classes were assigned to the Nkonkoni soil form and had a lower land capability due the absence of field crops, irrigated land, or old fields. The Augrabies soil form has a Moderate-High (Class 09) land capability due to presence of cultivated field. The Mispah soil forms, have Very low (Class 02) Land capability due to the shallow depth and presence of rocky outcrops. The Glenrosa, Swartland and Prieska soil forms has Low (Class 05) land capability.

The Soyuz 1 WEF is currently used for sheep farming. Additionally, two cultivated areas are present and is currently used as planted pastures (Medicago sativa or lucerne). The lucerne is produced under rainfed conditions. Using the long-term grazing capacity of 24 ha/LSU or 6 ha/SSU, the Soyuz 1 WEF development footprint will affect the forage of 25 sheep. This impact is distributed between the different landowners of the properties of the project site.

The areas where the crop fields are located, including a small pivot irrigated field near the Rietpoort guest house, has been delineated as land with **High** sensitivity. The total area with **High** sensitivity within the entire project site, is 60.35 ha. During the micro-siting and layout optimisation processes, all areas with High sensitivity has been avoided for the placement of infrastructure.

The largest part of the project site (approximately 11 685 ha) has **Low** agricultural sensitivity. Most of the infrastructure components have been placed in these areas. The rest of the site has **Medium** agricultural sensitivity (3 471 ha). Wind turbine 6-10 and 35-37, one construction camp and one substation fall in areas with **Medium** sensitivity.

It is anticipated that the construction phase will have impacts that range from medium to low and that through the consistent implementation of the recommendation mitigation measures, these impacts can all be reduced to low.

It is the specialists' professional opinion that this application be considered favourably, permitting that the mitigation measures are followed to prevent soil erosion and soil pollution and to minimise impacts on the veld quality of the farm portion that will be affected.

8.1.2 IMPACTS

The proposed project site currently has limited access roads. It is anticipated that the most significant change to the soil profiles will occur during the construction phase when the main and internal access roads as well as the areas where infrastructure will be erected, will be cleared of vegetation. During the construction phase, vehicles will traverse in and out of the construction camps and fuel, oils and greases that will be used by construction equipment and vehicles, may be stored on site. Construction materials will be transported and stored on site in the temporary laydown areas.

During the operation phase, the footprint of the project will remain the same as that developed during the construction phase. Temporary construction areas will be rehabilitated. Maintenance vehicles and equipment will travel on the main and internal access roads between the turbines and the offices and workshop. It is foreseen that these soil surfaces will remain bare and will be exposed to soil erosion by wind and water movement.

The decommissioning phase will have similar impacts to that of the construction phase as special cranes and other equipment will be used to remove the wind turbine materials. Soil in the areas where the turbine structures are removed will be exposed to soil erosion and soil pollution with materials as well fuel and lubricants from the construction vehicles, are impacts associated with this phase.

The anticipated impacts to soil during construction, operation and decommissioning phases are as follows:

- Reduction of land with natural vegetation for livestock grazing
- Soil erosion
- Soil pollution
- Soil compaction

Cumulative impacts are, however, difficult to accurately and confidently assess, owing to the high degree of uncertainty, as well as they're often being based on assumptions. It is therefore difficult to provide as detailed an assessment of cumulative impacts as is the case for direct and indirect project induced impacts. This is usually because of the absence of specific details and information related to cumulative impacts. In these situations, the EAP will need to ensure that any assumptions made as part of the assessment are made clear. Accordingly, this includes an overview and analysis of cumulative impacts related to a variety of project actions, and does not provide a significance rating for these impacts, as was done for direct project induced impacts. The objective is to identify and focus on potentially significant cumulative impacts so these may be taken into consideration in the decision-making process. It is important to realise these constraints, and to recognise that the assessment will not, and indeed cannot, be perfect. The potential for cumulative impacts will, however, be considered, rather than omitted from the decision making process and is therefore of value to the project and the environment.

8.1.3 Mitigation Measures

Mitigation measures are recommended to ensure that the potential impacts stemming from the clearance of vegetation for the construction, operational and future decommissioning activities of the WEF facility, access roads and associated infrastructure are minimized. The following measures have been recommended by the agricultural specialist:

- Vegetation clearance must be restricted to infrastructure and access road areas.
- Materials and equipment must only be stored in the pre-determined laydown areas.
- Removal of obstacles to allow for access of construction vehicles must be kept to only were essential.
- Prior arrangements must be made with the landowner and neighbouring landowners to ensure that farm and game animals are moved to areas where they cannot be injured by vehicles traversing the area.
- No boundary fence must be opened without the landowner or neighbouring landowners' permission.
- No open fires made by the construction teams are allowable during the construction phase.
- The supporting infrastructure must be constructed as closely as possible together to avoid fragmentation of the entire project site.
- Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude.
- Unnecessary land clearance must be avoided.
- Level any remaining soil removed from excavation pits that remained on the surface instead of allowing small stockpiles of soil to remain on the surface.
- Regularly monitor the site to check for areas where signs of soil erosion may start to appear.
- Should any soil erosion be detected, it must be addressed immediately through rehabilitation and surface stabilisation techniques.
- Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills.
- Any waste generated during construction, must be stored in designated containers, and removed from the site by the construction teams.
- Any left-over construction materials must be removed from site.
- Vehicles and equipment must travel within demarcated areas and not outside of the construction footprint.
- Where possible, conduct the construction activities outside of the rainy season.
- Vehicles and equipment must park in designated parking areas.
- Vehicles and equipment must travel within demarcated areas and not outside of the construction footprint.

8.2 AVIFAUNAL IMPACT ASSESSMENT

STUDY	Avifaunal Impact Assessment, Appendix E2
NATIONAL SCREENING TOOL	ANIMAL: HIGH AVIAN: LOW
SPECIALIST	Owen Davies
COMPANY	Arcus Consultancy Services South Africa (Pty) Ltd
QUALIFICATIONS	Specialist Declaration and CV, Appendix F2

8.2.1 CONCLUSION & SPECIALIST STATEMENT

An assessment of potential impacts relevant for birds at the proposed Soyuz 1 wind energy facility (WEF) yielded that impacts are likely to occur during the construction, operation, and decommissioning phases of the project. Indirect impacts, such as habitat modification, disturbance and displacement effects were identified to occur in most project phases, while more significant direct impacts, such as bird mortality due to collisions and/or electrocutions, are expected to occur during the projects' operational phase.

During the construction phase, birds can be impacted through the removal or alteration of habitats (particularly vegetation or other natural resources) and can also be displaced from foraging habitat by the construction of wind turbines and associated infrastructures.

During the operational phase, direct impacts include bird mortality, as a result of collision with wind turbine blades and/or power line infrastructure, as well as electrocution at electrical infrastructure. Heavy-bodied birds such as bustards, cranes and waterbirds, with limited manoeuvrability, are more susceptible to collisions with power line infrastructure. Electrocutions are likely limited to larger species whose wingspan is able to bridge the gap such as eagles or storks. Indirect impacts, including disturbance/displacement effects, have the potential to impact birds when conducting operational and maintenance (O&M) activities. It is expected that some species potentially occurring on the WEF site will be susceptible to disturbance and displacement, for example smaller passerines such as larks, warblers, flycatchers and chats, as well as large terrestrial Red Data species such as Karoo Korhaan and Ludwig's Bustard. Priority species nesting on the project site (including on new infrastructure e.g. powerline pylons) may be disturbed during routine maintenance.

During the decommissioning phase, birds can be impacted through the removal or alteration of habitats (particularly vegetation or other natural resources) and can also be displaced from foraging habitat by the construction of wind turbines and associated infrastructures.

In terms of cumulative impacts, such impacts on birds could increase as new facilities are constructed.

It is the specialist's opinion, based on the information contained in this report, that the proposed development can be approved from an avifaunal perspective provided the recommended mitigation measures are implemented.

8.2.2 IMPACTS

In light of the results and findings of the Avifaunal Specialist Impact Assessment undertaken for the proposed Soyuz 1 WEF, the following is a summary of the impacts assessed:

- Construction Phase:
  - Direct Habitat Destruction – modification, removal and clearing of vegetation for development of infrastructure such as temporary laydown areas, site buildings, WTG bases and access roads;
  - Disturbance/Displacement – indirect habitat loss and/or reduced breeding success due to displacement by noise and activity associated with machinery and construction activity; and
  - Direct Mortality – fatalities of avifauna due to vehicle collision, entrapment, entanglement or collision with temporary infrastructure (e.g. fencing), entrapment in uncovered excavations and increased predation pressure.
- Operational Phase:
  - Disturbance/Displacement – indirect habitat loss, reduced breeding success, obstruction of movement corridors due to displacement by infrastructure and noise/activity associated with ongoing, routine operational tasks/maintenance activity; and
  - Direct Mortality – fatalities of avifauna due to WTG collision, collision or entrapment with perimeter fencing, collision with internal power lines, and electrocution from energised components.
- Decommissioning Phase
  - As per construction phase.
- Cumulative Impacts
  - Following the implementation of the mitigation hierarchy it is not expected that the proposed development will have a significant contribution to the overall cumulative risks to avifauna in the area, as the position of the development site is within an area characterised by extensive available avifaunal habitat that is largely contiguous in the broader surrounds and avoids particularly sensitive features such as cliffs and ridges.

8.2.3 MITIGATION MEASURES

The implementation of the proposed mitigation measures is likely to reduce the significance of negative impacts. The impact of the WEF is likely to pose a moderate negative impact. To reduce the risk of potential impacts it is recommended that the following mitigation measures be included in the EMPr and that they are implemented during the various phases of development:

- Construction Phase:
  - Infrastructure to avoid Medium and High Sensitivity areas, linear infrastructure permitted;
  - The footprint within High Sensitivity areas must be minimized and avoided wherever possible;
  - Laydown and other temporary infrastructure to be placed within Low or Medium sensitivity areas, preferably previously transformed areas, wherever possible;
  - Appropriate run-off and erosion control measures must be implemented where required;
  - A site-specific environmental management programme (EMPr) must be developed and implemented. The EMPr must give appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction of habitat (e.g. no open fires outside of designated areas);
  - All contractors are to adhere to the EMPr and must apply good environmental practice during construction;

- The Environmental Control Officer (ECO) must oversee activities and ensure that the site specific EMPr is implemented and enforced;
- The appointed ECO must be trained to identify the potential Red Data species, as well as the signs that indicate possible breeding by these species;
- The ECO must during audits/site visits make a concerted effort to look out for such breeding activities of SCCs (e.g. cranes, Secretarybird). Additional efforts must include the training of construction staff (e.g. in Toolbox talks) to identify Red Data species, followed by regular questioning of staff as to the regular whereabouts on site of these species;
- All hazardous materials must be stored in the appropriate manner to prevent contamination of the site and downstream environments. Any accidental chemical, fuel and oil spills that occur at the site must be cleared as appropriate for the nature of the spill;
- Maximum use of existing roads, farm tracks and servitudes must be used where possible;
- The minimum footprint areas of infrastructure must be used wherever possible, including road widths and lengths;
- Following construction, rehabilitation of areas disturbed by temporary laydown areas and facilities must be undertaken;
- No off-road driving must be permitted in undesignated areas;
- Existing and novel access roads are to be suitably upgraded or constructed to prevent damage and erosion resulting from increased vehicular traffic and construction vehicles;
- Construction camps must be lit with as little light as practically possible, with the lights directed downwards where appropriate;
- Speed limits (50 km/h) must be strictly enforced on site to reduce probability of vehicle collisions;
- The movement of construction personnel must be restricted to the construction areas on the project site;
- No dogs or cats other than those of the landowners must be allowed on site;
- Any holes dug e.g., for foundations of pylons must not be left open for extended periods of time to prevent entrapment by ground dwelling avifauna or their young and only be dug when required and filled in soon thereafter;
- Temporary fencing must be suitably constructed, e.g. if double layers of fencing are required for security purposes, they must be positioned at least 2 m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences;
- Roadkill must be reported to the ECO and removed as soon as possible; and
- If any avifaunal SCCs are confirmed to be breeding (e.g. if a nest site is found), construction activities within 500 m of the breeding site must cease, and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed.

- Operational Phase:
  - WTGs must not be constructed within (or encroach within) any High or Medium Sensitivity areas identified by the VERA model;
  - WTGs are to be micro-sited to avoid blade tips from encroaching within these areas pending the specifics of final WTG dimensions;
  - Additional mitigation (as detailed below) must be implemented for WTGs placed within High and Medium sensitivity areas determined outside of VERA modelled areas;
  - Internal power lines must be buried wherever technically feasible;

- Appropriate (approved) Bird Flight Diverters (BFDs) must be affixed to the entire length of novel overhead power lines (in all sensitivity categories);
- If one or more avifaunal SCC carcasses are located and determined likely to have resulted from collisions with infrastructure in any sensitivity area over the lifespan of the facility, the fatality is to be appropriately recorded and reported to an avifaunal specialist to determine the most appropriate action;
- If double layers of fencing are required for security purposes, they should be positioned at least 2 m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences;
- Develop and implement a carcass search and bird activity monitoring programme in-line with the latest applicable guidelines;
- Regular reviews of operational phase monitoring data (activity and carcass) and results to be conducted by an avifaunal specialist;
- The above reviews should strive to identify sensitive locations including WTGs and areas of increased collisions that may require additional mitigation;
- An operational monitoring programme for any novel overhead power lines must be implemented to locate potential collision fatalities;
- Any fatalities located must be reported to Birdlife South Africa (BLSA) and the Endangered Wildlife Trust (EWT);
- All new overhead power line pylons must be of a design that minimizes electrocution risk. This can be achieved by using adequately insulated 'bird friendly' structures, with sufficient clearances between live components; and
- An operational monitoring programme for the overhead power line route must be implemented to locate potential collision fatalities.

- Decommissioning Phase:
  - As per construction phase.
- Cumulative Impacts:
  - All appropriate mitigation measures listed above should be implemented;
  - Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management; and
  - Implement an alien woody plant removal and eradication programme to restore currently degraded grassland and aquatic habitats.
- No-go alternative:
  - No mitigation required, in the event that the facility is not constructed.

8.3 BAT IMPACT ASSESSMENT

STUDY	**Bat Specialist Impact Assessment, Appendix E3**
NATIONAL SCREENING TOOL	**BATS: HIGH**
SPECIALIST	**Craig Campbell**
COMPANY	**Arcus Consultancy Services South Africa (Pty) Ltd. (an ERM Group Company)**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F1**

8.3.1 CONCLUSION & SPECIALIST STATEMENT

An assessment of potential impacts relevant for bats at the proposed Soyuz 1 wind energy facility (WEF) yielded that impacts are likely to occur during the construction, operation and decommissioning phases of the project. Indirect impacts, such as habitat modification, disturbance and displacement effects were identified to occur in most project phases, while more significant direct impacts, such as bat mortality due to collisions and/or barotrauma, are expected to occur during the projects' operational phase.

During the construction phase, bats can be impacted through the removal or alteration of habitats (particularly vegetation or other natural resources) and can also be displaced from foraging habitat by the construction of wind turbines and associated infrastructures. The removal of vegetation during the construction phase can impact bats by removing vegetation cover and linear features that some bats use for foraging and commuting. This modification could subsequently also create favourable conditions for insects, upon which bats feed, which would in turn attract bats to the proposed wind farm area. Additionally, wind farms have the potential to impact bats indirectly when conducting construction activities (for wind turbines and associated infrastructures) during hours of important bat foraging activities, and excessive noise and dust during the construction phase could also result in bats abandoning their roosts, depending on the proximity of construction activities to roosts.

During the operational phase, direct impacts include bat mortality as a result of collision with wind turbine blades and/or barotrauma. This is likely to be limited to species that use the airspace within the rotor-swept zone, but nonetheless serves as a significant contributor to bat fatalities and species population decline, as a result of wind farm operations. Indirect impacts, including disturbance/displacement effects, have the potential to impact bats when conducting operational and maintenance (O&M) activities during hours of important bat foraging activities. Additionally, excessive noise and dust during the operational phase could also result in bats abandoning their roosts, depending on the proximity of construction activities to roosts.

During the decommissioning phase, wind farms have the potential to impact bats indirectly through the disturbance of roosts or when conducting decommissioning activities during hours of important bat foraging activities. Excessive noise and dust during the decommissioning phase could also result in bats abandoning their roosts, depending on the proximity of decommissioning activities to such roosts.

In terms of cumulative impacts, such impacts on bats could increase as new facilities are constructed. These impacts could result in declines in populations of even those species of bats currently listed as Least Concern, if they happen to be more susceptible to mortality from wind turbines (e.g. high-flying open air foragers such as free-tailed and fruit bats), even if the appropriate mitigation measures are applied.

The no-go alternative has been assessed for bats, considering the proposed development under consideration, together with its associated impacts. As reflected in the final bat specialist impact assessment report, the impact on bats already existing in the area would be negligible, in the event that the facility is not constructed –as no change is anticipated to occur.

With the information gathered to date from the full bat pre-construction monitoring campaign, the development of the proposed Soyuz 1 WEF and its associated infrastructures is not expected to cause irreplaceable loss to bat biodiversity on site, provided that the recommended mitigation measures are strictly adhered to. The application process may therefore proceed onto submission for environmental authorisation report.

8.3.2 IMPACTS

In light of the results and findings of the Bat Specialist Impact Assessment undertaken for the proposed Soyuz 1 WEF, it is acknowledged that there is a potential to impact bats directly through collisions and barotrauma resulting in mortality, and indirectly through the modification of habitats and disturbance/displacement effects during the construction, operation and decommissioning of wind turbines and associated infrastructures..

The following is a summary of the impacts assessed:

- Construction Phase
  - Habitat Modification.
  - Disturbance/Displacement Effects
- Operational Phase
  - Mortality due to wind turbine collisions and/or barotrauma.
  - Disturbance/Displacement Effects
- Decommissioning Phase
  - Disturbance/Displacements Effects
- Cumulative Impacts
  - Bat mortality impacts on a cumulative scale (as a result of wind turbine collisions and barotrauma)
- No-go Alternative
  - No impacts anticipated.

8.3.3 MITIGATION MEASURES

The implementation of the proposed mitigation measures is likely to reduce the significance of negative impacts. The impact of the WEF is likely to pose a moderate to high negative impact. However, if the mitigation measures listed below are successfully implemented, then the overall significance can be reduced to low to moderate. It is recommended that the following mitigation measures, be included in the EMPr for the various phases of the WEF:

- Construction Phase
  - The removal of vegetation and man-made buildings should be avoided in all high sensitive areas, as far as possible, and reduced across the project site in all other areas.
  - Limit construction activities to daylight hours only
  - Avoid all construction activities within potential roosting habitats, if identified at the time when construction activities (for wind turbines and associated infrastructures) take place. No confirmed roosts have been identified on site to date, although it is recommended for a final specialist site walk-through to take place prior to construction to confirm this.
- Operational Phase
  - Implement an operational phase bat monitoring programme, in accordance with the most recent version of the operational phase bat monitoring guidelines.
  - Implement blade feathering (up to the manufacturers cut-in speed) as soon as operation begins, to prevent free-wheeling.
  - The placement of all turbines, as well as their full blade length, should avoid high sensitivity areas, to be considered from the outset of the design phase.

- If residual impacts reach the threshold limit (at any wind turbine), then appropriate minimisation measures should be implemented (turbine curtailment and/or acoustic deterrence mechanisms).
- Lighting at the project should be kept to a minimum at all associated infrastructures. Appropriate types of lighting are to be used to avoid attracting insects, and hence, bats. This includes downward facing low-pressure sodium and warm white LED lights. To be considered from the outset of the design phase.
- Limit O&M activities to daylight hours.
- Avoid all O&M activities for wind turbines and associated infrastructures within potential bat roosting habitats. No confirmed bat roosts have been identified on site to date, although it is recommended that a suitably qualified bat specialist (appointed to conduct the operational phase bat monitoring programme) is to further advise on refining these recommendations as new information becomes available, during the project's operational phase.

- Decommissioning Phase
  - Limit decommissioning activities to daylight hours only.
  - Avoid all decommissioning activities within potential roosting habitats, if identified during the projects' operational phase bat monitoring campaign, when decommissioning wind turbines and associated infrastructures. Consult with the appointed bat specialist on further management measures, should this be required.
- Cumulative Impacts
  - All mitigation measures, as listed for the operational phase of the project are highly recommended for WEF's in the greater (50 KM2) Project area, to reduce the probability of significant mortality impacts occurring at Soyuz 1 WEF, and subsequently on a cumulative scale as well. This will be relevant for the Soyuz 1 WEF, as well as all surrounding WEF's.
  - Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive management processes across projects.
- No-go Alternative
  - No mitigation required, in the event that the facility is not constructed.

8.4 BOTANICAL IMPACT ASSESSMENT

STUDY	**Botanical Impact Assessment, Appendix E4**
NATIONAL SCREENING TOOL	**PLANT SPECIECS: MODERATE** **TERRESTRIAL BIODIVERSITY: VERY HIGH**
SPECIALIST	**Tarryn Martin**
COMPANY	**Biodiversity Africa**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F4**

8.4.1 CONCLUSION & SPECIALIST STATEMENT

This botanical impact assessment considers the potential botanical impact on the surrounding environment due to the construction, operational and future decommissioning activities associated with the Soyuz 1 Wind Energy Facility.

The turbines and access roads are mostly situated within Eastern Upper Karoo with some infrastructure occurring in the Upper Karoo Hardeveld and one road occurring within the Wash. The SEI for these vegetation types have been assessed and Upper Karoo Hardeveld is of **medium sensitivity** and Eastern Upper Karoo is of **low sensitivity** meaning that construction within these areas is permissible from a botanical perspective.

Vegetation associated with the washes was assigned a **high sensitivity**. Where feasible, it is recommended that infrastructure should avoid being located within these areas. Road crossings would be permissible.

The species environmental guideline document states for areas of medium sensitivity, development activities of medium impact are acceptable and for areas with a low SEI, development activities of medium to high impact are acceptable. In both instances these must be followed by appropriate restoration activities.

Some infrastructure is located within an Ecological Support Area (ESA). The biodiversity features driving the ESA classification includes all natural wetlands and rivers and it is therefore recommended that infrastructure is placed outside of the ESA and where this is not feasible the footprint within the ESA is minimised.

Project infrastructure should be designed to avoid sensitive features such as the washes. Further to the above, impacts on the terrestrial plant species and associated habitats can be reduced to acceptable levels through the implementation of mitigation measures. The specialist is therefore of the opinion that the development can proceed provided the recommendations contained in this report are implemented.

8.4.2 Impacts

The clearing of vegetation for the construction of the WEF facility, access roads and associated infrastructure could result in the following impacts:

- The direct and permanent loss of vegetation types and associated plant species, including species of conservation concern.
- Clearing of vegetation resulting in breaks in habitat that will lead to habitat fragmentation and edge effects.
- Clearing of vegetation and subsequent disturbance to the soil, and therefore seed bank, leading to the infestation of alien invasive plant species and other ruderal species.

It was determined that the significance of impacts during the construction, operation and decommissioning phases would be:

- Of a **moderate significance** for the loss of the Eastern Upper Karoo during the construction phase.
- Of a **moderate significance** for the loss of the Upper Karoo Hardeveld during the construction phase.
- Of a **high significance** for the loss of plant Species of Conservation Concern during the construction phase.
- Of a **moderate significance** for the disruption of ecosystem functioning and processes during construction phase.
- Of a **high significance** for the infestation of Alien Plant Species during the operation phase.
- Of a **moderate significance** for loss of indigenous vegetation during the decommissioning phase.

The no-go impacts, which are based on the current land use of the site, are of **low significance**.

8.4.3 Mitigation Measures

Mitigation measures are recommended to ensure that the potential impacts stemming from the clearance of vegetation for the construction, operational and future decommissioning activities of the WEF facility, access roads and associated infrastructure are minimized. The following measures have been recommended by the botanical specialist:

- The remaining vegetation within the property should remain intact so that it can continue to function as an ecological corridor for species movement.
- All necessary plant permits must be obtained prior to the commencement of any construction activities.
- Where feasible, laydown areas must be placed in previously disturbed sites.
- A walkthrough of the final layout must be undertaken by a botanist for areas of high and medium sensitivity and if populations of SCC will be impacted, infrastructure should be moved to avoid these areas. Where this is not feasible, a search and rescue plan will be required.
- If any SCC are to be impacted, these must be relocated to the nearest appropriate habitat.

- Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.
- Topsoil (20 cm, where possible) must be collected and stored in an area of low sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g., laydown areas).
- Employees must be prohibited from collecting any plants.
- Alien invasive plant clearing should be undertaken in line with an Alien Vegetation Management plan, which should be compiled as part of the EMPr and implemented with immediate effect.
- Only indigenous plant species typical of the local vegetation and approved by a botanist should be used for the rehabilitation of natural habitat.

8.5 FAUNAL IMPACT ASSESSMENT

STUDY	**Faunal Impact Assessment, Appendix E5**
NATIONAL SCREENING TOOL	**ANIMAL: HIGH** **TERRESTRIAL BIODIVERSITY: VERY HIGH**
SPECIALIST	**Amber Jackson**
COMPANY	**Biodiversity Africa**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F1**

8.5.1 CONCLUSION & SPECIALIST STATEMENT

Several amphibian, reptile and mammal species were recorded within the study area across all habitat types. The Grassland and Dwarf Succulent Karoo habitat types are extensive and for the most part unimpacted by the proposed development. Although road networks can be extensive these have been designed to utilise existing roads and tracks to reduce further loss of habitat.

The grassland habitat and rocky habitats are sensitive habitats and have a **medium site ecological importance** to both the the vulnerable Black-footed Cat and endangered Southern Mountain Reedbuck respectively. The rocky habitats are sensitive habitats and have a **high site ecological importance** to the endangered Karoo Dwarf Tortoise within its distribution range. The project is unlikely to negatively influence the viability of these species.

The Wash habitat and riverine areas within the Dwarf Succulent Karoo habitat would have a **very high site ecological importance** to the Riverine Rabbit (*Bunolagus monticularis*) should it occur in the study area. The study area is located less than 50km northeast of the northern population of the Riverine Rabbit and suitable habitat is present. There is a moderate likelihood of this species occurring within the wash and riverine habitats. Soyuz 1 WEF project infrastructure avoids this habitat and linear infrastructure uses existing roads through the habitat.

It is recommended that the following conditions are included in the Final Environmental Management Programme (EMPr) as well as the conditions of the Environmental Authorisation (EA), if granted:

- Avoid wash and river habitat in Dwarf Succulent Karoo as far as possible, if unavoidable utilise area already disturbed e.g. roads.
- Should any reptile species of conservation concern, e.g. Karoo Dwarf Tortoise (*Chersobius boulengeri*) (EN), be encountered and if in harm's way during construction and operation, these must be moved out of harm's way to the nearest appropriate habitat.
- The development must consolidate road networks were possible to minimise the loss of faunal habitat.

- Temporary footprints e.g., laydown areas and widened roads must be rehabilitated with specific measures to create fauna habitat.
- Speed restrictions for all vehicles 30km/h is recommended) should be in place to reduce the impact of killed fauna on the project roads.
- Development must be designed to allow unencumbered movement of this species. e.g., trenches with sloped side to allow faunal species to exit.
- A Storm Water Management Plan must be drafted and implemented to prevent runoff entering aquatic systems and causing siltation and pollution of this faunal habitat. Hard surfaces should be avoided.
- Should any reptile and mammal fauna of conservation concern be encountered during construction and operation, these must be recorded (i.e. be photographed, GPS co-ordinates taken) and placed on iNaturalist
- Any reptile, amphibian or mammal (excl. bat) species that may die as a result of construction must be recorded (i.e. be photographed, GPS co-ordinates taken) and ideally, if somewhat intact preserved and donated to the nearest university, museum or SANBI.
- In addition to all mitigations listed above a clause must be included in contracts for ALL personnel working on site stating that: "*no wild animals will be hunted, killed, poisoned or captured. No wild animals will be imported into, exported from or transported in or through the province. No wild animals will be sold, bought, donated and no person associated with the development will be in possession of any live wild animal, carcass or anything manufactured from the carcass*." A clause relating to fines, possible dismissal and legal prosecution must be included should any of the above transgressions occur, especially for SCC.

Project infrastructure should be designed to avoid very high sensitive features such as the washes, only existing roads that cross this habitat should be used, where feasible. Further to the above, impacts on the faunal species and associated habitats can be reduced to acceptable levels through the implementation of mitigation measures. **The specialist is therefore of the opinion that the development can proceed *provided* the recommendations contained in this report are implemented.**

8.5.2 IMPACTS

In light of the results and findings of the Faunal Specialist Impact Assessment undertaken for the proposed Soyuz 1 WEF, the following is a summary of the impacts assessed:

- Construction Phase
  - The loss of faunal habitat.
  - Loss of Faunal Species of Conservation Concern.
  - Disturbance to faunal species and their livelihood due to construction related activities.
  - Faunal mortality due to earthworks, roadkill and persecution.
- Operational Phase
  - Disturbance to faunal species and their livelihood due to operational related activities.
  - Faunal mortality due to roadkill and persecution.
- Decommissioning Phase
  - Disturbance to faunal species and their livelihood due to operational related activities.
- Cumulative Impacts
  - Increased loss of faunal habitat.
  - Increased faunal mortality.

The mitigation hierarchy was applied to all impacts. For negative impacts that can often not be avoided, the mitigation hierarchy then aims to minimise the impact, and should residual impacts remain, mitigation measures are then applied and in extreme cases offsets may be required. Some impacts will remain the same

despite mitigation measures having been applied. For example, the development footprint will replace faunal habitat, this cannot be avoided and although it can be minimised the habitat will no longer exist and will not be able to re-establish itself for the lifetime of the project. It should be noted that although a mitigation measure may not reduce the impact significance rating (high, medium and low) they must still be applied because the impact has not been avoided in its entirety and the 'Duty of Care' is placed on the applicant/developer.

8.5.3 Mitigation Measures

In light of the results and findings of the Faunal Specialist Impact Assessment undertaken for the proposed Soyuz 1 WEF, the following is a are the mitigation measures for the construction, operational and decommissioning phases:

- Construction Phase
  - The development must consolidate road networks to minimise the loss of faunal habitat.
  - All construction and construction related activities (including parking of vehicles and machinery) must remain within the approved project footprint.
  - Microhabitats (e.g., rock stacks and logs) in the clearing footprint must be relocated to the same habitat immediately adjacent to the removal site. E.g., Rock stacks should be restacked.
  - Temporary infrastructure (laydown areas, widened roads, etc.) must be rehabilitated and efforts must provide habitat for faunal species by placing logs and rocks at strategic sites to provide shelter for small mammals and reptiles.
  - A clause must be included in contracts for ALL personnel (i.e., including contractors) working on site stating that: "no wild animals will be hunted, killed, poisoned or captured. No wild animals will be imported into, exported from or transported in or through the province. No wild animals will be sold, bought, donated and no person associated with the development will be in possession of any live wild animal, carcass or anything manufactured from the carcass."
  - In addition, a clause relating to fines, possible dismissal and legal prosecution must be included should any of the above transgressions occur, especially for SCC.
  - Should any reptile species of conservation concern, e.g., Karoo Dwarf Tortoise (*Chersobius boulengeri*) (EN), be encountered and if in harm's way during construction and operation, these must be moved out of harm's way to the nearest appropriate habitat.
  - Avoid wash and river habitat in Dwarf Succulent Karoo as far as possible.
  - Dust suppression measures must be implemented in the dry and/or windy months.
  - All machinery, vehicles and earth moving equipment must be maintained and the noise these create must meet industry minimum standards. e.g., the sound generated by a machine must be below a certain decibel as prescribed in the relevant noise control regulations.
  - A Storm Water Management Plan must be drafted and implemented to prevent runoff entering aquatic systems and causing siltation and pollution of this faunal habitat. Hard surfaces should be avoided.
  - No construction night lighting must be allowed. If required, minimise lighting in open space areas within development and any external lights must be down lights placed as low as possible and installation of low UV emitting lights, such as most LEDs.
  - Steep sided drains, gutters, canals and open pits/trenches must be covered with mesh (5mm x 5mm) or sloped to prevent fauna falling in and getting stuck. No unnecessary structures that would act as pitfall traps for animals must be constructed.

- Speed restrictions within the residential development for all vehicles (30km/h is recommended) should be in place to reduce the impact of killed fauna on the project roads.
- Any faunal species that may die as a result of construction must be recorded (i.e., be photographed, GPS co-ordinates taken) and if somewhat intact preserved and donated to the nearest university, museum or SANBI.
- A trained snake handler must be on call during construction to remove any snakes within construction areas.
- A clause relating to fines, possible dismissal and legal prosecution must be included in all contracts for ALL personnel (i.e., including contractors) working on site should any speeding or persecution of animals occur.

- Operational Phase
  - All vehicles must be maintained e.g., the sound generated by a vehicle must be below a certain decibel as prescribed in the relevant noise control regulations.
  - No night lighting must be allowed. If required, minimise lighting in open space areas within development and any external lights must be down lights placed as low as possible and installation of low UV emitting lights, such as most LEDs.
  - Development must be designed to allow unencumbered movement, especially of small faunal species. e.g.
    - Permeable internal and external fences/walls (if any) must be implemented to allow for the movement of fauna through the development. These must have ground level gaps of 10cm x 10cm at 10m intervals. These gaps must be kept free of obstructions, including plant growth and debris.
    - All guttering and kerbstones must to allow for easy movement of small fauna.
    - Steep sided drains, gutters and canals must be covered with mesh (5mm x 5mm) or sloped to prevent fauna falling in and getting stuck.
  - All vehicles must be maintained e.g., the sound generated by a vehicle must be below a certain decibel as prescribed in the relevant noise control regulations.
  - No night lighting must be allowed. If required, minimise lighting in open space areas within development and any external lights must be down lights placed as low as possible and installation of low UV emitting lights, such as most LEDs.
  - Development must be designed to allow unencumbered movement, especially of small faunal species. e.g.
  - Permeable internal and external fences/walls (if any) must be implemented to allow for the movement of fauna through the development. These must have ground level gaps of 10cm x 10cm at 10m intervals. These gaps must be kept free of obstructions, including plant growth and debris.
  - All guttering and kerbstones must to allow for easy movement of small fauna.
  - Steep sided drains, gutters and canals must be covered with mesh (5mm x 5mm) or sloped to prevent fauna falling in and getting stuck.
  - Speed restrictions within the project area for all vehicles (30km/h is recommended) should be in place to reduce the impact of killed fauna on the project roads.
  - No night driving should be permitted, if unavoidable, this must be restricted, and speed limits adhered to.

- Any faunal species that may die as a result of collision must be recorded (i.e., be photographed, GPS co-ordinates taken) and placed on the EWT Roadkill App.
- A clause relating to fines, possible dismissal and legal prosecution must be included in all contracts for ALL personnel (i.e., including contractors) working on site should any speeding or persecution of animals occur.

- Decommissioning Phase
  - Dust suppression measures must be implemented in the dry and/or windy months.
  - All machinery, vehicles and earth moving equipment must be maintained and the noise these create must meet industry minimum standards. e.g., the sound generated by a machine must be below a certain decibel as prescribed in the relevant noise control regulations.
  - Should any mammal, reptile or amphibian fauna be encountered during decommissioning, these must be recorded (i.e., be photographed, GPS co-ordinates taken) and placed on iNaturalist.
  - No night lighting must be allowed. If required, minimise lighting in open space areas within development and any external lights must be down lights placed as low as possible and installation of low UV emitting lights, such as most LEDs.
  - All decommissioning related activities (including parking of vehicles and machinery) must remain within the approved project footprint.

The footprint of the project must be rehabilitated. Rehabilitation efforts must provide microhabitats (e.g., rock stacks and logs) within the cleared footprint E.g., Rock stacks and stumperies but must not disrupt adjacent habitat to create these.

8.6 FRESHWATER IMPACT ASSESSMENT

STUDY	River and Wetland Ecosystem Specialist Report, Appendix E6
NATIONAL SCREENING TOOL	AQUATIC BIODIVERSITY: VERY HIGH
SPECIALIST	Aidan Gouws
COMPANY	Coastal and Environmental Services
QUALIFICATIONS	Specialist Declaration and CV, Appendix F6

8.6.1 CONCLUSION & SPECIALIST STATEMENT

Several Soyuz 1 (Pty) Ltd is proposing the development of a 480 MW commercial WEF, comprised of up to 75 turbines, internal cabling, substations, BESS, batching plants, auxiliary buildings and access roads. Fifty-nine assessment units, including washes, flats, low-order drainage lines and dams, fall within the proposed 150 ha project area. According to the PES assessment, the condition of these range from "**B: Largely Natural**" to "**D: Poor**". A number of the assessment units offer **moderately-low** to **moderately-high** importance ecosystem services, including flood attenuation, sediment and nutrient trapping, biodiversity maintenance and food for livestock. Two units offer **high** biodiversity services, due to their role in conservation as part of the Graafwaterspruit ESA. The combined Ecological Importance and Sensitivity (EIS) ratings of the units range from **low** to **high**.

Only two longitudinal washes (A02 and A07) are anticipated to be directly impacted by the proposed development, due to proposed turbines falling within their prescribed buffers and/or access roads and/or powerlines crossing through them. A few additional watercourses and wetlands fall within 100 m and 500 m of the proposed infrastructure, respectively. The proposed infrastructure must not be established within the channelled low order drainage lines (F01-14) or their buffers. With the exception of linear crossings, the proposed infrastructure should not occur within the longitudinal washes or their buffers. If such cannot be adhered to for well substantiated reasons, the mitigation hierarchy must be applied to provide justification

for the consideration of alternatives and an offset may be required to compensate for the direct losses. Access roads should follow the existing road network as far as practically possible. Where new watercourse crossings are required, the length/extent of new watercourse crossings must be minimised as far as practically possible. Unnecessary watercourse crossings must be re-aligned and avoided where possible.

The river and wetland impact of all aspects for the development were assessed. Impacts are rated as **low** to **moderately-high** under a realistic poor mitigation scenario. the adoption and effective implementation of all the recommended mitigation measures, coupled with a comprehensive rehabilitation and monitoring in terms of re-vegetation and restoration is an important element of the mitigation strategy. Effectively implementing the recommended mitigations measures will reduce all impacts to **very low** to **moderately-low** significance. If any of the recommended mitigation measures provided in this study cannot be adhered to, the impact and risk assessments will need to be revised. It is the opinion of the specialist that **no fatal flaws** exist with the proposed development as long as all recommended mitigation measures are adopted and effectively implemented.

8.6.2 IMPACTS

In light of the results and findings of the Freshwater Specialist Impact Assessment undertaken for the proposed Soyuz 1 WEF, the following is a summary of the impacts assessed:

- Construction Phase:
  - Direct ecosystem modification or destruction / loss impacts.
  - Alteration of hydrological and geomorphological processes.
  - Ecological connectivity and edge disturbance impacts.
  - Water pollution impacts.
  - Cumulative direct impacts - modification and/or loss of watercourse units across the entire Soyuz 1 WEF Cluster.
  - Cumulative indirect impacts - widespread, permanent alteration of hydrological and geomorphological processes within watercourses across the entire Soyuz 1 WEF Cluster at and downstream of the proposed infrastructure.
- Operational Phase:
  - Alteration of hydrological and geomorphological processes.
  - Ecological connectivity and edge disturbance impacts.
  - Water pollution impacts
- Decommissioning Phase:
  - Direct ecosystem modification or destruction / loss impacts.
  - Alteration of hydrological and geomorphological processes.
  - Ecological connectivity and edge disturbance impacts.
  - Water pollution impacts.

The following activities may have an indirect impact on moderately to high sensitivity areas and should not occur within their proposed buffers:

- Stockpiling of topsoil, subsoil, etc.;
- Temporary ablution facilities;
- Site camp establishment;
- Temporary laydown areas for equipment/materials;
- Overnight parking of heavy machinery/vehicles;

- Concrete batching; and
- Storage of chemicals/hazardous substances.

8.6.3 Mitigation Measures

The mitigation measures provided below are to be implemented in the Planning and Design, Construction, Operational and Decommissioning Phases of the proposed activity.

- Planning and design phase
  - All legal matters pertaining to permitting must be completed prior to any construction activity.
  - In particular, all necessary Water Use Authorisations must be in order for any construction and operational activities within 100 m of a watercourse (i.e., longitudinal washes and channelled drainage lines) or 500 m of a wetland (i.e., dams).
  - An Erosion and Stormwater Management Plan should be developed during the planning and design phase, and implemented during the construction, operational and decommissioning phases.
  - An Emergency Spillage and Hazardous Waste Management Plan should be developed during the planning and design phase, and implemented during the construction, operational and decommissioning phases.
- Construction phase:
  - The following buffers should be applied to all watercourses and wetlands (i.e. channelled drainage lines and longitudinal washes) based on their EIS rating:
    - High EIS – 50 m;
    - Moderate to moderately-high EIS – 30 m; and
    - Moderately-low EIS – 15 m
  - In accordance with the best practice guidelines, unnecessary watercourse powerline and road crossings (i.e. proposed crossings that can be re-aligned) must be re-aligned and avoided.
  - Construction materials and stockpiles must not be stored within the moderate to high EIS areas or their buffers.
  - If possible, construction activities should be undertaken during the driest part of the year to minimize erosion and downstream sedimentation due to excavation, etc.
  - Appropriate stormwater structures must be implemented during construction to control run-off and minimize erosion.
  - Vegetation clearing must be kept a minimum and only to the site footprint.
  - Erosion controls and sediment trapping measures must be put in place.
  - Stockpiles must be monitored for erosion and mobilisation of materials towards watercourses, they must not exceed 1.5m in height and be covered during windy periods.
  - Best practice powerline and access road crossing alignment measures must be implemented, where watercourse crossings are required, every effort should be made to minimize the impacts.
  - Disturbed areas must be monitored for erosion channels and these must be rehabilitated.
  - All trenches/excavations must be backfilled and all disturbed areas backfilled, compacted and revegetated, where applicable.
  - Road crossings should be used to assist in re-instating some of the lost base level as a result of historical erosional incision. The proposed access roads should serve a dual function, namely as a crossing of the washes and a means of stabilising the longitudinal slope of the watercourses.
  - Anchored brush packs should be used in Badlands to assist with their rehabilitation.

- Within Soyuz 1, targeted rehabilitation at road crossings should be concentrated within units A02 and A07 in particular. Several other assessment units within the broader WEF cluster can also be targeted for rehabilitation.
- No concrete mixing must take place within 50 m of any watercourse.
- No machinery must be parked overnight within 50 m of the watercourses.
- All stationary machinery must be equipped with a drip tray to retain any oil leaks.
- Chemicals used for construction must be stored safely on bunded surfaces in the construction site camp.
- No ablution facilities must be located within 50 m of any watercourse.
- Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution.
- Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it.
- All general waste and refuse must be removed from site and disposed and windproof temporary storage area before being disposed of at a registered landfill site.
- Emergency plans must be in place in case of spillages onto bare soil or within watercourses.

- Operational Phase:
  - Stormwater infrastructure must be maintained and monitored for effectiveness with respect to controlling and minimising erosion and sedimentation of watercourses.
  - "Drift-type" road crossings be used where appropriate and designed for flow over the road surface rather than directing it under the road with culverts. Where access road crossings of defined channels is required, box culverts must be stablished across the width of the watercourse.
  - The site must be monitored for erosion and should be rehabilitated where applicable.
  - Disturbed areas should be rehabilitated and re-vegetated.
  - watercourses.
  - All stationary machinery must be equipped with a drip tray to retain any oil leaks.
  - Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it.
  - All general waste and refuse must be removed from site and disposed and windproof temporary storage area before being disposed of at a registered landfill site.
  - Emergency plans must be in place in case of spillages onto bare soil or within water courses.
- Decommissioning Phase:
  - Decommissioned materials and rubble must not be stored within the moderate to high sensitivity areas.
  - Stockpiles must not be stored within the moderate to high sensitivity areas.
  - If possible, decommissioning activities should be undertaken during the driest part of the year to minimize erosion and downstream sedimentation due to excavation, etc.
  - Appropriate stormwater structures must be implemented during decommissioning to control run-off and minimize erosion.
  - Erosion controls and sediment trapping measures must be put in place.
  - Disturbed areas must be monitored for erosion channels and these must be rehabilitated.
  - All trenches/excavations must be backfilled and all disturbed areas backfilled, compacted and revegetated, where applicable.

- No machinery must be parked overnight within 50 m of the watercourses.
- All stationary machinery must be equipped with a drip tray to retain any oil leaks.
- Chemicals used for construction must be stored safely on bunded surfaces in the construction site camp.
- No ablution facilities must be located within 50m of any watercourse.
- Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution.
- Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it.
- All general waste and refuse must be removed from site and disposed and windproof temporary storage area before being disposed of at a registered landfill site.

Emergency plans must be in place in case of spillages onto bare soil or within watercourses.

8.7 HERITAGE IMPACT ASSESSMENT

STUDY	**Heritage Impact Assessment, Appendix E7**
NATIONAL SCREENING TOOL	**ARCHAEOLOGICAL AND CULTURAL HERITAGE: LOW**
SPECIALIST	**Nelius Kruger**
COMPANY	**Coastal and Environmental Services**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F7**

8.7.1 CONCLUSION & SPECIALIST STATEMENT

The history of the Northern Cape Province is reflected in a rich archaeological landscape, mostly dominated by Stone Age occurrences. Generally, numerous sites documenting Earlier, Middle and Later Stone Age habitation occur across the province, mostly in open air locales or in sediments alongside rivers or pans. In addition, a wealth of Later Stone Age rock art sites, most of which are in the form of rock engravings are to be found in the larger landscape. These sites occur on hilltops, slopes, rock outcrops and occasionally in river beds. The archaeological record reflects the development of a rich Colonial frontier, characterised by traces of the Anglo-Boer war, indigenous and colonial contact sites and more recent historic occupation and development of the region, which herald the modern era in South African history.

Data on the history and archaeology of the surroundings of Britstown is primarily captured in heritage and archaeological studies associated with environmental impact assessments, the bulk of which are associated renewable energy facilities and particularly solar energy facilities and associated infrastructure. In order to arrive at a final Layout for the proposed project, a rigorous process of site screening was conducted for the Soyuz 1 WEF at desktop level. Here, a detailed appraisal of previous AIAa, HIAs and published literature coupled with a detailed analysis of historical aerial imagery and archive, topographical, geological and landscape feature maps was conducted in order to inform on the final layout for the WEF during the **Scoping Phase.** An archaeological site assessment was then conducted to identify heritage receptors on-site and in the larger landscape. It should be noted that information on the layout of components such as the 132kV OHL line, laydown areas, construction camps and BESS areas were made available to specialists at an advanced stage of this assessment and these areas could not be included in the site surveys. Some turbine positions and access road alignments were changed during final stages of the project design in order to avoid sensitive environmental and heritage receptors and not all of these proposed development areas could be revisited. In terms of heritage impacts, WEF developments with linear and narrow components such as OHLs

and access roads are generally considered to be lower-risk since localised and spatially confined heritage resources can easily be avoided by project design of individual turbine positions, pylon placements and service roads. The following observations are made for the proposed Soyuz 1 Wind Energy Facility Project in terms of heritage aspects, impacts and heritage resources management.

- Stone Age remains occur abundantly in the project landscape (observations at **S1WEF04 - S1WEF14**) where locally available raw material for the manufacture of stone tools is available in the geological setting. Most of the artefacts are probably Middle Stone Age (MSA) lithics such as blades, scrapers, chunks and cores produced on locally sourced hornfels and siltstones. Despite the high number of observations of artefacts and high densities in places, these resources are common and representative of similar scatters across widespread areas of the Karoo. The widespread but ephemeral scatters are often of low heritage value due to temporally mixed contexts and the frequent absence of faunal, organic and other cultural remains which is scattered over thousands of square kilometres of the Karoo. The Stone Age localities are not conservation-worthy and even though the resources may be destroyed during construction, the impact is inconsequential.
- A number of dolerite hills and outcrops occur in the project area and two sites displaying striations on dolerite rocks were encountered (**S1WEF01, S1WEF03**). These striations might be remnants of Khoekhoen pastoralist rock art or it might date to a Colonial Period farmer presence. Many of the Dolerite hills and outcrops in the project landscape have been removed from developable areas layouts on Scoping Level and the will not be impacted by the project.
- The poorly preserved remains of a stone packed dwelling was documented at the area marked **S1WEF02** approximately 150m east of turbine position B6-74. The site, probably a “veewagtershuis” during the late Historical Period has been assigned a medium archaeological significance and it is situated outside of project development areas and impact is not foreseen. Site monitoring will be required throughout the construction phase of the Project in order to avoid impact on the site and potential destruction of previously undetected heritage sites and human burials.
- It is assumed that findings in this assessment provides an accurate representation of the heritage landscape and potential site sensitivities. Still, it is recommended that final site walkovers be conducted of potential heritage sensitive zones in areas where turbine positions and access road alignments have been changed significantly prior to construction. In addition, site walkovers of potential heritage sensitive zones in the proposed 132kV OHL line alignments, laydown areas, construction camps and BESS areas will be required prior to construction.
- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.

8.7.2 IMPACTS

In light of the results and findings of the Heritage Specialist Impact Assessment undertaken for the proposed Soyuz 1 WEF, the following is a summary of the impacts assessed:

- Preconstruction Phase

Heritage risks and impacts are commonly associated with construction activities. WEF developments and OHL developments (linear and narrow) are generally considered to have a lower-risk impact potential since

localised and spatially confined heritage resources can easily be avoided by project design of individual turbine, road and pylon placements and other infrastructure. No impact on archaeological sites, built environment features, human burials and the cultural landscape is foreseen during the preconstruction phase.

- Construction Phase

Construction activities pose the greatest threat to tangible heritage resources within the cultural landscape and it is often during this Phase that heritage sites are lost. An array of archaeological areas occurs across the project landscape, many of which have been excluded from infrastructure development zones at Scoping Level. Still, Stone Age localities of low significance and not conservation-worthy occur in project footprints even though the resources may be destroyed during construction, the impact is inconsequential. Previously undetected cultural (archaeological) layers are usually superficial, subsoil layers and that makes them easily vulnerable to destruction and the likelihood for encountering additional cultural heritage sites as the land clearing process commences, or during construction of infrastructure should be considered. It should be noted that graves and cemeteries do not only occur around farmsteads in family burial grounds but they are also randomly scattered around archaeological and historical settlements in the rural areas of the Northern Cape Province. The probability of informal human burials encountered during the construction phase should thus not be excluded. Monitoring activities will be required throughout the construction phase of the Project in order to avoid the destruction of previously undetected heritage sites and human burials. Site monitoring of the Historical Period veewagtershuis site (**S1WEF02**) will be required throughout the construction phase of the Project in order to avoid the destruction of previously undetected heritage sites and human burials.

- Operations Phase

It is understood that no new areas will be disturbed and/or impacted during the operations phase of the project and the risk and severity of heritage impacts should decrease once the projects activate. Furthermore, the majority of sites of archaeological and heritage significance would have been recorded and/or assessed in preceding phases. However, impact on previously undetected archaeological sites, human burials and the cultural landscape might occur as a result of operational activities (site access, movement, maintenance, trespassing, natural elements, hazards etc). During the Operations Phase, the continuation of management measures for the Historical Period veewagtershuis site (S1WEF02) should be tracked and continuous ECO site monitoring will be required.

- Decommissioning and Post-Closure Phase

The decommissioning phase will see the progressive downscaling and termination of operations. Similar to the Operations Phase, no new areas are expected to be disturbed and/or impacted and no additional sites of archaeological and heritage significance are expected to be impacted on during decommissioning. During the decommissioning and closure phase, it may be recommended that the ECO review management procedures for heritage sites and ensure that effective measures were implemented.

- Cumulative Impacts

It is the opinion of the Specialist that the proposed Soyuz 1 Wind Energy Facility and its associated power line connection will have a low negative cumulative impact on the heritage value of the area for the following reasons:

- The low frequency of significant archaeological resources documented in the project area and in its immediate surroundings implies low-severity short and long-term impacts on the heritage landscape. In

addition, localised and spatially confined heritage resources can easily be avoided by project design of individual turbines, pylon placements and service roads.

- The significance of the landscape in terms of its heritage is bound not to change during the course of construction, operation and decommissioning of the project.
- The proposed Soyuz 1 WEF is situated in region which has seen the rapid development of vast and large-scale renewable energy facilities such as the Maanhaarberg WEF, the Great Karoo Renewable Energy Facility, the Modderfontein WEF and many Solar PV Developments around the town of De Aar. The developments cumulatively add to a transformed landscape and sense of place where the character of this portion of the Karoo is evolving into a centre for renewable power generation.
- It should be noted that archaeological knowledge and the initiation of research projects into significant archaeological sites often result from Heritage Impact Assessments conducted for developments. Provided that significant archaeological sites are conserved and that appropriate heritage mitigation and management procedures are followed, the cumulative impact of development can be positive.

8.7.3 Mitigation Measures

The objective of heritage resource management is to ensure conservation of heritage resources of significance, prevent unnecessary disturbance and/or destruction of previously undetected heritage receptors. Recommendations for relevant heritage resource management actions are vital to the conservation of heritage resources . In light of the results and findings of the Heritage Specialist Impact Assessment undertaken for the proposed Soyuz 1 WEF, the following is a summary of the mitigation measures.

For the wide-spread Stone Age occurrences and observations of low significance within the project area (**S1WEF04 - S1WEF14**) as well as the Historical Period veewagtershuis site (**S1WEF02**) east of Turbine B6-74, the following are required in terms of heritage management and mitigation:

- Construction Phase:
    - **Site Monitoring:** General Site Monitoring in order to detect the presence of and limit impact on previously undocumented heritage receptors during construction / site clearing / earth moving.
- Decommissioning Phase:
    - **Site Monitoring:** General Site Monitoring in order to detect the presence of and limit impact on previously undocumented heritage receptors during construction / site clearing / earth moving.

8.8 Noise Impact Assessment

STUDY	**Noise Impact Assessment, Appendix E8**
NATIONAL SCREENING TOOL	**NOISE: VERY HIGH**
SPECIALIST	**Morné de Jager**
COMPANY	**Enviro Acoustic Research cc.**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F8**

8.8.1 Conclusion & Specialist Statement

This noise study considers the potential noise impact on the surrounding environment due to the construction, operational and future decommissioning activities associated with the Soyuz 1 Wind Energy Facility.

The significance of the noise impact will be of a **low** significance during the daytime period, though there is a potential of a noise impact of **high** significance for night-time construction activities. The significance of the noise impact during the operation phase would be **low** for daytime operational activities, but the significance would be **high**[2] for night-time operational activities.

The no-go alternative will not change the soundscape, with ambient sound levels remaining very low.

8.8.2 Impacts

Considering the ambient sound levels measured onsite, the proposed noise limits as well as the calculated noise levels, it was determined that the significance of the potential noise impacts would be:

- of a **low significance** for the construction of access roads;
- of a **low significance** relating to noises from construction traffic;
- of a **low significance** for the daytime construction activities (hard standing areas, excavation and concreting of foundations and the assembly of the WTG and other infrastructure);
- of a potential **high significance** for the night-time construction activities (the pouring of concrete, erection of WTG). Mitigation measures are available and were included in this report, that should reduce the significance of the noise impact to **low**;
- of a **low significance** for daytime operational activities (noises from wind turbines) when considering the worst-case SPL; and
- of a **high significance** for night-time operational activities (noises from wind turbines) when considering the worst-case SPL. Mitigation measures are available and were included in this report, that should reduce the significance of the noise impact to **low**.

There is a **low significance** for a cumulative noise impact to occur during the operational phase.

8.8.3 Mitigation Measures

Mitigation measures are recommended to ensure that the potential annoyance due to construction noise are minimized. Potential measures could include:

- Agreement between the applicant and the land owner that the structures near NSR07 will not be used for residential purposes if the project proceeds; **or**
- That the applicant designs and implement a noise abatement programme to ensure that the projected noise levels are less than 45 dBA at NSR07 (during periods that the structures are used for residential purposes). This could include using a WTG (within 2,000 m from NSR07) that has different sound reduction modes (such as a WTG with a noise emission level less than 106.5 dBA re 1 pW); **or**

[2] The high noise level relates to a total of 13 WTG cumulatively raising the noise levels.

- The applicant can change the layout, removing WTG B6-57 (or relocating it further than 2,000m from this NSR), at the same time moving other WTG (WTG B6-56, B6-59 and B6-60) further than 1,000m from NSR07; **or**
- The applicant can do both of the following:
  - change the layout, removing WTG B6-57 (or relocating it further than 2,000m from this NSR); **and**
  - select a WTG with a SPL less than 108.5 dBA (re 1 pW) within 2,000m from NSR07 (WTG B6-56, B6-59 and B6-60).

Operational noise levels will exceed 45 dBA (for the layout and wind turbine as assessed), exceeding the upper noise limit recommended in this report. It is therefore recommended that the applicant consider:

- Agreement between the applicant and the landowner that the structures near NSR07 will not be used for residential purposes if the project proceed; or
- The applicant designs and implements a noise abatement programme to ensure that the projected noise levels are less than 45 dBA at NSR07 (during periods that the structures are used for residential purposes). This could include using WTG (within 2,000m from NSR07) that has different sound reductionmodes (such as WTG with a noise emission level less than 106.5 dBA re pW); **or**
- The applicant can change the layout, removing WTG B6-57 (or relocating it further than 2,000m from this NSR), at the same time moving other WTG (WTG B6-56, B6-59 and B6-60) further than 1,000m from NSR07; **or**
- The applicant can use a WTG can reduce SPL to less than 106.5 dBA (re 1 pW) - within 2,000m from NSR07; or
- The applicant can change the layout, removing WTG B6-57 (or relocating it further than 2,000m from this NSR), at the same time moving WTG further than 1,000m from NSR07; or
- The applicant can:
  - change the layout, removing WTG B6-57 (or relocating it further than 2,000m from this NSR); **and**
  - select a WTG with a SPL less than 108.5 dBA (re 1 pW) within 2,000m from NSR07.

8.9 PALAEONTOLOGICAL IMPACT ASSESSMENT

STUDY	**Palaeontological Impact Assessment, Appendix E9**
NATIONAL SCREENING TOOL	**PALAEONTOLOGICAL: HIGH**
SPECIALIST	**Elize Butler**
COMPANY	**Banzai Environmental**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F9**

8.9.1 CONCLUSION & SPECIALIST STATEMENT

The project is mostly underlain by Late Caenozoic alluvium, a small portion of Tertiary-Quaternary Calcrete as well as Jurassic Karoo dolerite and the Tierberg Formation (Ecca Group) of the Karoo Supergroup. This part of the basin is extensively intruded by dolerite dykes and sills baking the surrounding Ecca Group sediments, thus compromising the fossil heritage of the area through thermal metamorphism. According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Late Caenozoic superficial deposits is Moderate, that of Tertiary-Quaternary Calcrete is High while that of the Jurassic dolerite is Zero. The Palaeontological Sensitivity of the Tierberg Formation (Ecca Group) is High (Almond *et al*, 2013; SAHRIS website).

Extensive research and fossil collecting have been conducted by palaeontologists in the last few decades, however, the Britstown area have been largely neglected. A 6-day overall comprehensive site-specific field survey of the Soyuz WEF Cluster was conducted on foot and by motor vehicle in October 2022. In the area investigated no fossiliferous outcrops were recovered. This could be attributed to the dolerite intrusions that metamorphized potentially fossiliferous Beaufort sediments, low relief of the development as well as poor bedrock exposure and relative unfossiliferous superficial sediments. However, it must be emphasised that the presence of well-preserved fossils is not ruled out.

A **medium palaeontological significance** has been allocated for the construction phase of the WEF development pre-mitigation and a **low significance** post mitigation. The construction phase will be the only development phase impacting Palaeontological Heritage and **no significant impacts** are expected to impact the Operational and Decommissioning phases. As the No-Go Alternative considers the option of 'do nothing' and maintaining the status quo, it will have a Neutral impact on the Palaeontological Heritage of the development. The Cumulative impacts of the Soyuz 1 WEF development near Britstown is considered to be **high** pre- mitigation and **low** post mitigation and falls within the acceptable limits for the project. It is therefore considered that the proposed development will not lead to destructive impacts on the palaeontology of the area. **The construction of the development may thus be authorized in its whole extent, as the development footprint is not considered sensitive from a palaeontological point of view. It is thus recommended that no further palaeontological heritage studies, ground truthing or specialist mitigation are required pending the discovery of new fossil assemblages.**

8.9.2 IMPACTS

In light of the findings of the Palaeontological Specialist Impact Assessment undertaken for the proposed Soyuz 1 WEF, the loss of fossil heritage will be a **negative** impact. Only the site will be affected by the proposed development. The expected duration of the impact is assessed as potentially permanent to long term. In the absence of mitigation procedures, the damage or destruction of any palaeontological materials will be permanent. Impacts on palaeontological heritage during the construction phase could potentially occur and are regarded as having a **high probability**. As fossil heritage will be destroyed the impact is irreversible. The significance of the impact occurring will be **high** pre-mitigation and **low** post-mitigation.

8.9.3 MITIGATION MEASURES

The findings of the Palaeontological Specialist Impact Assessment undertaken for the proposed Soyuz 1 WEF has recommended the following mitigation measures for the construction, operational and decommissioning phases:

- The ECO for this project must be informed that the Ecca Group of the Karoo Supergroup has a **High Palaeontological Sensitivity**.
- If any fossil remains or trace fossils are discovered during any phase of construction or operation, either on the surface or exposed by excavations, the ECO in charge of this development should implement the **Chance find Protocol** immediately. These discoveries should be protected (if possible, *in situ*) and the ECO must report such discoveries to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). Suitable mitigation (*e.g.,* recording and collection) will consequently be undertaken by a palaeontologist.
- Before any fossil material can be collected from the development site, the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection

(museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012).
- These recommendations should be incorporated into the Environmental Management Plan for the Soyuz 1 WEF.

8.10 SOCIAL IMPACT ASSESSMENT

STUDY	**Social Impact Assessment**
NATIONAL SCREENING TOOL	**NONE RELEVANT**
SPECIALIST	**Hilda Bezuidenhout**
COMPANY	**CES**
QUALIFICATIONS	**Refer to Specialist Declaration and CV, Appendix F10**
REVIEW	**Ted Avis**

8.10.1 CONCLUSION & SPECIALIST STATEMENT

All projects have negative impacts, some of which even cannot be mitigated, but these negative impacts have to be weighed against the positive impacts that the project will have, when making a recommendation on whether or not the project should be approved from a social point of view. Refer below to the social impacts after mitigation.

The anticipated positive social impacts associated with the WEF are:

- Job creation: construction phase (High Positive).
- Job creation: operation phase (High Positive).
- SMME development (High Positive).
- Support of local/regional businesses: construction phase (Moderate Positive).
- Possibility for training and upskilling of local community during construction, operation and through LED projects (Moderate Positive).
- Possible reduction in crime rates (Low Positive).
- Supply of electricity to the national grid and positive contribution to the country's economy (High Positive).

The anticipated negative social impacts associated with the WEF are:

- In-migration of job seekers (Low Negative).
- Increase in traffic during construction (Low Negative).
- Noise from construction activities (Low Negative).
- Noise from operation (Low Negative).
- Heritage (Moderate Negative).
- Possible reduction in crime rates (Low Positive).
- Loss of agricultural land (Low Negative).
- Visual impacts and loss of sense of place (Moderate Negative).
- Impact on tourism (Low Negative).

In an interview with the Traffic Department, noise impacts associated with the project was mentioned as likely negligible as Britstown is located on the N12 that is already heavily utilised by trucking, and the project should therefore not affect the town more than it is already being affected by current activities. Noise impacts during construction, both from construction vehicles and construction activities, will be temporary in nature. During operation, noise impacts will also be negligible. Measures, as identified in the Noise Impact Assessment, should be adhered to avoid negatively impacting the wellbeing of residents.

8.10.2 IMPACTS

Impacts during construction

- **Employment and other income generation opportunities**

Support of local/regional businesses: Personnel that come to the area during the construction phase will likely support local businesses, such as hospitality facilities, food outlets, etc. Local or regional businesses may also be able to supply some of the construction materials.

- **Employment and other income generation opportunities**

Job Creation: A number of employment opportunities will be created during the construction phase

- **Training opportunities and skills development**

Possibility for training and upskilling of local community during construction, operation and through LED projects: There may be an opportunity to provide training and develop skills during both construction and operation phases. It is anticipated that there may also be such opportunities arising from the WEF's LED programme subsequent to commencement of operation.

- **In-migration of job seekers**

In-migration of job seekers: A large-scale in-migration of people in search of work is often a concern associated with new developments. However, this usually applies to larger developments, and is not expected to happen in a large scale in the instance of the WEF.

- **Traffic**

Increase in traffic during construction: There will likely be an increase in traffic, especially construction vehicles, during the construction phase. However, this, will be temporarily, and the Traffic Department did not express a concern in that regard, as the N12 is already used, and therefore able to accommodate, heavy duty traffic including trucks. A specialist Traffic Impact Assessment has also been undertaken and these features have been addressed in detail in this report. The results are summarised in Section 8.11.

- **Noise**

Noise from construction activities: Construction activities will create some noise disturbance, but since the development will be located outside town boundaries, it will likely not have much impact on residents of Britstown.

Noise from operation: Noise from wind turbines may cause disturbance, especially during night time.

- **Heritage**

There may be sensitive heritage features on the site that may be impacted: There may be sensitive heritage features on the site that may be impacted. A specialist Heritage Impact Assessment has been undertaken and these features have been addressed in detail in this report. The results are summarised in Section 8.7.

- **Crime and security**

Possible reduction in crime rates: The presence of the project could possibly reduce the rate of petty theft and stock theft in the area. People may also resort less to crime if they obtain legitimate income through employment or business opportunities.

- **Changes in land use**

Loss of agricultural land: A small amount of agricultural land (used for grazing currently) will be lost to the wind turbines and access roads, but this will not be significant.

- **Visual impacts and sense of place**

Negative visual impact and loss of sense of place: WEFs invariably have a visual impact on an area. Many people perceive this as negative, and as spoiling the sense of place. A specialist Visual Impact Assessment has also been undertaken and these features have been addressed in detail in this report. The results are summarised in Section 8.12.

- **Impact on tourism**

Loss of income due to visual impacts: The presence of the WEF may negatively impact a hunting establishment in that international clientele seek the specific aesthetic of the desolate landscape, which will change as a result of the WEF.

- **Supply of electricity to the national grid and positive contribution to the country's economy**

Additional supply of energy to the national grid: There is currently considerable need and demand for additional electrical power and particularly for electricity from renewable and other diverse sources. This project will positively contribute to meeting these needs.

Decommissioning phase

The assessment of impacts for the decommissioning phase are brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied. Due to the fact that no wind energy facilities have been decommissioned in South Africa, CES believes it responsible to stipulate that further assessment in the form of a decommissioning environmental management programme be drafted, in consultation with specialists, when this phase becomes relevant.

8.10.3 Social Mitigation Measures

The impact of the WEF before mitigation is likely to pose various impacts ranging from low to high, including negative and positive impacts. These impacts vary in nature, including direct, indirect, and cumulative. The implementation of the proposed mitigation measures is likely to reduce the significance of negative impacts. However, if the mitigation measures listed below are successfully implemented, then the overall significance can be reduced to between low and moderate. It is recommended that the following mitigation measures, be included in the EMPr and that they are implemented during the various phases of development.

Construction phase mitigation includes:

- Good communication about the project needs to be practiced throughout as both locals and businesses need time to plan accordingly for any changes that will occur in the area.
- Ensure that notice is given, and landowners and locals are properly informed throughout the project.
- A positive relationship must be established and maintained with affected landowners. There should always be an open line of communication and grievances must be addressed satisfactorily and promptly.
- Affected landowners must be consulted and respected in terms of access to the site, security and all activities on the site, in order to minimise negative impacts to landowners. Disruptions to directly affected and adjacent landowners must be kept to a minimum.
- Complaints and concerns must be addressed promptly, and feedback must be given to complainants.
- Employment opportunities and criteria should be communicated to the community before being advertised outside the municipal area.
- Hiring should focus on the nearest and surrounding community. If not, jealousy and disdain or resentment for the project may develop.

- Unreasonable expectations with regards to employment opportunities should not be created, and the developers should be transparent about the limited number of employment opportunities that will be created.
- Ensure local SMME's are utilised throughout the project, as far as possible.
- The creation of secondary opportunities for income generation, such as supplying meals to employees, should be investigated and implemented if possible.
- External contractors and suppliers from within the local municipality must be given preference.
- Source materials and products locally, as far as possible.

Operational mitigation measures include:

- Recommendations and mitigation measures contained in the Heritage Impact Assessment must be adhered to.
- Measures should be taken to ensure security around any construction site, including maintaining access control onto affected farms.
- Affected landowners must be consulted and respected in terms of access to the site, security and all activities on the site, in order to minimise negative impacts to landowners.
- Proper consultation needs to take place between farmers local municipality, landowners and the developer. In addition, landowners will be compensated for the use of their land by the developer.
- Mitigation measures suggested by the visual impact specialist must be adhered to.

8.11 TRAFFIC IMPACT ASSESSMENT

STUDY	**Traffic Impact Assessment, Appendix E11**
NATIONAL SCREENING TOOL	**NONE RELEVANT**
SPECIALIST	**A Johnson**
COMPANY	**JG Afrika (Pty) Ltd**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F11**

8.11.1 CONCLUSION & SPECIALIST STATEMENT

The potential traffic and transport related impacts for the construction, operation and decommissioning phases of the proposed Soyuz 1 WEF were identified and assessed.

- The main impact on the external road network will be during the construction phase. This phase is temporary in comparison to the operational period. The number of abnormal loads vehicles was estimated and to be found to be able to be accommodated by the road network.
- During operation, it is expected that maintenance and security staff will periodically visit the facility. It is assumed that approximately 20 full-time employees (Subject to change. However, based on experience with similar projects, the number of full-time employees is generally low and consequently, the associated trips are negligible) will be stationed on site. The traffic generated during this phase will be minimal and will not have an impact on the surrounding road network.
- The traffic generated during the construction phase, although significant, will be temporary and impacts are considered to be negative and of moderate significance before and of low significance after mitigation.
- The traffic generated during the decommissioning phase will be less than the construction phase traffic and the impact on the surrounding road network will also be considered negative and of moderate significance before and of low significance after mitigation.

The potential mitigation measures mentioned in the construction and decommissioning phases are:

- Dust suppression
- Component delivery to/ removal from the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network.
- Staff and general trips should occur outside of peak traffic periods as far as possible.
- A “dry run” of the preferred route.
- Design and maintenance of internal roads.
- Any low hanging overhead lines (lower than 5.1m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved or raised to accommodate the abnormal load vehicles.

The construction and decommissioning phases of a wind farm are the only significant traffic generators and therefore noise and dust pollution will be higher during these phases. The duration of these phases is short term i.e. the impact of the WEF on the traffic on the surrounding road network is temporary and wind farms, when operational, do not add any significant traffic to the road network.

The access points to the proposed site have been assessed and all were found to be acceptable from a transport perspective.

The development is supported from a transport perspective provided that the recommendations and mitigations contained in this report are adhered to.

The potential impacts associated with proposed Soyuz 1 WEF and associated infrastructure are acceptable from a transport perspective and it is therefore recommended that the proposed facility be authorised.

8.11.2 IMPACTS

The potential transport related impacts are described below.

Construction Phase:

- Construction related traffic.
- The construction traffic would also lead to noise and dust pollution.
- This phase also includes the construction of roads, excavations, trenching and ancillary construction works that will temporarily generate the most traffic.

Operational Phase:

- During operation, it is expected that staff and security will visit the facility. Approximately 20 full-time employees (Subject to change. However, based on experience with similar projects, the number of full-time employees is generally low and consequently, the associated trips are negligible) will be stationed on site.
- The traffic generated during this phase will be minimal and will not have an impact on the surrounding road network.

Decommissioning Phase:

- This phase will result in the same impact as the Construction Phase as similar trips are expected.

Cumulative Impacts:

- Traffic congestion/delays on the surrounding road network.
- Noise and dust pollution

8.11.3 Mitigation Measures

The following mitigation measure are proposed to potentially reduce the impact during the Construction Phase:

- The delivery of wind turbine components to the site must be staggered and trips must be scheduled to occur outside of peak traffic periods.
- Dust suppression of gravel roads during the construction and decommissioning phases, as required.
- Regular maintenance of gravel roads by the Contractor during the construction and decommissioning phases.
- The use of mobile batching plants and quarries on or in close proximity to the site would decrease the impact on the surrounding road network.
- Staff and general trips should occur outside of peak traffic periods as far as possible.
- Any low hanging overhead lines (lower than 5.1 m) e.g., Eskom and Telkom lines, along the proposed routes will have to be moved to accommodate the abnormal load vehicles.
- The preferred route should be surveyed to identify problem areas e.g., intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification. After the road modifications have been implemented, it is recommended to undertake a "dry-run" with the largest abnormal load vehicle, prior to the transportation of any turbine components, to ensure that the delivery of the turbines will occur without disruptions. This process is to be undertaken by the haulage company transporting the components and the contractor, who will modify the road and intersections to accommodate abnormal vehicles. It needs to be ensured that the gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading of the construction phase and reinstated after construction is completed.
- Design and maintenance of internal roads. The internal gravel roads will require grading with a road grader to obtain a flat even surface and the geometric design of these gravel roads needs to be confirmed at detailed design stage. This process is to be undertaken by a civil engineering consultant or a geometric design professional. The road designer should take cognizance that roads need to be designed with smooth, relatively flat gradients to allow an abnormal load vehicle to ascend to the top of a hill.

The proposed mitigation measures for the construction traffic will result in a minor reduction of the impact on the surrounding road network, but the impact on the local traffic will remain low as the existing traffic volumes are deemed to be low. The dust suppression, however, significantly reduces the impact.

The following mitigation measure are proposed to potentially reduce the impact during the Operational Phase:

- It is assumed that approximately 20 full-time employees will be stationed on site during the operational phase of the facility. Assuming 40% of trips occur during the peak hour, approximately 8 peak hour trips are estimated for the operational phase.
- The operational peak hour trips generated by staff are expected to be low and will have a negligible impact on the external road network.

The following mitigation measure are proposed to potentially reduce the impact during the Decommissioning Phase:

- The decommissioning phase will result in the same impact as the Construction Phase as similar trips are expected. The potential traffic impact will be of medium significance before mitigation measures during the construction and decommissioning phases. However, considering that this is temporary and short term in nature, the impact can be mitigated to an acceptable level of low significance.

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

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

8.12 VISUAL IMPACT ASSESSMENT

STUDY	**Visual Impact Assessment, Appendix E12**
NATIONAL SCREENING TOOL	**LANDSCAPE: VERY HIGH**
SPECIALIST	**Tosca de Villiers**
COMPANY	**Nuleaf Planning and Environmental (Pty) Ltd**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix F12**

8.12.1 CONCLUSION & SPECIALIST STATEMENT

The The visual assessment indicates that the construction and operation of the proposed Soyuz 1 WEF will have an overall high visual effect on both the rural landscape and on sensitive receptors in the study area. The visual impact will differ amongst places, depending on the distance from the facility, but it is expected to be of the highest significance within (but not restricted to) a 5km radius of the proposed facility. Within this distance it will generally be restricted to residents of homesteads, as well as observers travelling along the various roads in the area (i.e., N12 and R398). This is largely due to the relatively close distance between the observers and the wind turbines, as well as the generally flat topography.

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

The areas of higher cumulative visual exposure (especially along the plains) contain sensitive visual receptors in the form of residents of homesteads and observers travelling along the national (N12), arterial (R398) and secondary roads traversing the plains. It is expected that should all 450 wind turbines of the Britstown Wind Farm Cluster be constructed; the potential cumulative visual impacts may range from moderate (where observers are absent i.e. vacant natural land) to high significance (where observers are present i.e. at homesteads and along roads).Additionally, since only a limited number of other REFs are located within the study area it is not expected that these smaller facilities will further contribute to the expected cumulative visual impact of the Britstown Wind Farm Cluster. Should the Britstown Wind Farm Cluster be constructed then these facilities will most likely be experienced as one facility by observers in the area. The overall cumulative visual impact of Britstown Wind Farm Cluster is therefore ultimately expected to be of **high** significance on the region due to the very large surface area it covers, its remote location, as well as the sensitivity of the identified receptors to this kind of development.

This study found that fifteen (15) turbines**,** located on the central portion of the Soyuz 1 WEF adjacent to the R398 are likely to have a shadow flicker impact on motorists using this portion of the R398. Other areas to potentially be impacted on by shadow flicker are located along the internal farm roads located in the designated development properties**.** These roads are likely to be affected by the six (6) turbines shaded in purple. It is, however, expected that the number of motorists travelling on these roads will be very limited and the level of exposure will be brief, thereby, not constituting a shadow flicker visual impact of concern for these receptors.

Conventional mitigation (e.g., such as screening of the structures) of the potential visual impacts is highly unlikely to succeed due to the nature of this type of development (tip height exceeding 260m) and the receiving environment. However, a number of best practice mitigation measures have been proposed (Section 9.4) in order to limit the impacts that can be mitigated. Additionally, irrespective of whether or not mitigation measures will reduce the significance of the anticipated visual impacts, they are considered to be best practice, and should all be implemented and maintained throughout the construction, operation and decommissioning phases of the proposed facility, should it be authorized. Impacts deemed possible to mitigate are general lighting of the facility and the construction activities on sensitive receptors in close proximity of the proposed facility.

In order to ensure that all the spatial analyses and mapping undertaken in this report is as accurate as possible, a transparent and scientifically defensible approach, in line with best practice methodology for this type of assessment, has been utilised. The objective of this process is to quantify the potential visual impacts associated with the proposed Soyuz 1 WEF, using visibility analyses, proximity analyses and the identification of sensitive receptors. However, it must be noted that visual impact is a very subjective concept, personal to each individuals' backgrounds, opinions and perceptions. The subjects in this case are the identified sensitive receptors such as the residents of the homesteads, observers travelling along public roads and visitors to the region.

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

1. Non-compliance with Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites.
2. Non-compliance with conditions of existing Records of Decision.

3. Impacts that may be evaluated to be of high significance and that are considered by the majority of the stakeholders and decision-makers to be unacceptable.

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

Since no reported objections from stakeholders or decision-makers within the region regarding the visual impacts have been received by the EAP (during the scoping phase), this assessment has adopted a risk averse approach by assuming that the perception of most (if not all) of the sensitive visual receptors (bar the landowners of the properties earmarked for the development), would be predominantly negative towards the development of a WEF in the region. While still keeping in mind that there are also likely to be supporters of the Soyuz 1 WEF (as renewable energy generation is a global priority) amongst the population of the larger region, they are largely expected to be indifferent to the construction of the WEF and not as vocal in their support for the wind farm as the detractors thereof.

In spite of the predominantly high residual ratings (as assessed in Section 9) and the likelihood that the proposed development could be met with concern and objections from some of the affected sensitive receptors and landowners in the region, this report cannot categorically state that any of the above conditions were transgressed. Therefore, the visual impacts are not considered to be a fatal flaw for a development of this nature. It is recommended that the proposed Soyuz 1 WEF, as per the assessed layout be supported from a visual perspective, subject to the implementation of the suggested best practice mitigation measures, as provided in this report.

8.12.2 IMPACTS

In light of the results and findings of the Visual Impact Assessment undertaken for the Soyuz 1 WEF proposed, it is acknowledged that the receiving environment will be significantly visually transformed for the entire operational lifespan of the facility.

The following is a summary of the impacts assessed:

- The potential visual impact of construction on sensitive visual receptors in close proximity to the facility is likely to be of **high** significance before mitigation and **moderate** significance post mitigation.
- The potential visual impact of facility operations on sensitive visual receptors in close proximity (within 5km) to the proposed facility is likely to be of **very high** significance. No mitigation is possible for a facility of this scale.
- The potential visual impact of facility operations on sensitive visual receptors within the local area (between 5 - 10km offset) to the proposed facility is likely to be of **high** significance. No mitigation is possible for a facility of this scale.
- The potential visual impact of facility operations on sensitive visual receptors within the district (between 10 - 20km offset) to the proposed facility is likely to be of **moderate** significance. No mitigation is possible for a facility of this scale.
- The potential visual impact of facility operations on sensitive visual receptors within the region (beyond the 20km offset) to the proposed facility is likely to be of **low** significance. No mitigation is possible for a facility of this scale.
- The anticipated visual impact of operational lighting at night on sensitive visual receptors within the study area is likely to be of **high** significance and may be mitigated to **moderate** should the possible best practice mitigation measures be implemented and approval for changes to the CAA lighting is approved.

- The expected visual impact of shadow flicker on sensitive receptors in close proximity to the proposed development is likely to be of **moderate** significance before mitigation and **low** significance post mitigation.
- The expected visual impact of ancillary infrastructure on sensitive receptors in close proximity to the proposed development is likely to be of **moderate** significance.
- The potential visual impact of the proposed facility operations on the visual quality of the landscape and sense of place of the region is likely to be of **high** significance. No mitigation is possible for a facility of this scale.
- The cumulative visual impacts are likely to be of **high** significance when the proposed Soyuz 1 WEF and the five other proposed facilities that form part of the Britstown Wind Farm Cluster within the study area are in operation.

8.12.3 Mitigation Measures

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

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

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

- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
- Plan ancillary infrastructure (i.e., substation and workshop) in such a way and in such a location that clearing of vegetation is minimised. Consolidate existing infrastructure as much as possible, and make use of already disturbed areas rather than pristine sites wherever possible.
- Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible, and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
- Access roads, which are not required post-construction, should be ripped and rehabilitated.
- The Civil Aviation Authority (CAA) prescribes that aircraft warning lights be mounted on the turbines. However, it is possible to obtain permission to mount these lights on the turbines representing the outer perimeter of the facility. In this manner, fewer warning lights can be utilised to delineate the facility as one large obstruction, thereby lessening the potential visual impact. It is therefore recommended that the possibility of this be investigated.
- Install aircraft warning lights that only activate when the presence of an aircraft is detected, if permitted by CAA.
- Mitigation of visual impacts associated with the construction phase, albeit temporary, entails proper planning, management and rehabilitation of all construction sites. Construction should be managed according to the following principles:
    - Ensure that vegetation is not unnecessarily cleared or removed during the construction period.
    - Reduce the construction period through careful logistical planning and productive implementation of resources.

- Plan the placement of lay-down areas and any potential temporary construction camps along the corridor in order to minimise vegetation clearing.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
- Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
- Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
- Ensure that all infrastructure and the site and general surrounds are maintained and kept neat.
- Rehabilitate all disturbed areas, construction areas, roads, slopes etc. immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.
- Monitor all rehabilitated areas for at least a year for rehabilitation failure and implement remedial action as required. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.

- Mitigation of other lighting impacts includes the pro-active design, planning and specification lighting for the facility. The correct specification and placement of lighting and light fixtures will go far to contain rather than spread the light. Additional measures include the following:
  - Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself);
  - Limiting mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights;
  - Making use of minimum lumen or wattage in fixtures;
  - Making use of down-lighters, or shielded fixtures;
  - Making use of Low-Pressure Sodium lighting or other types of low impact lighting.
  - Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.
- During Operations, monitor the general appearance of the facility as a whole, as well as all rehabilitated areas.
  - The maintenance of the turbines and ancillary structures and infrastructure will ensure that the facility does not degrade, thus aggravating visual impact. Implement remedial action where required.
  - Where sensitive visual receptors are likely to affected, it is recommended that the developer enter into negotiations regarding the potential screening of visual impacts at the receptor site. This may entail the planting of vegetation, trees or even the construction of screens. Ultimately, visual screening is most effective when placed at the receptor itself.
  - Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as a when required.
- After decommissioning, all infrastructure should be removed and all disturbed areas appropriately rehabilitated. Monitor rehabilitated areas post-decommissioning and implement remedial actions and consult an ecologist regarding rehabilitation specifications if necessary.

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

8.13 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 EIA Phase of the proposed WEF.

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 IMPACT ASSESSMENT

9.1 IMPACT ASSESSMENT METHODOLOGY

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

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

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

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

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

Table 9-1: Ranking of Evaluation Criteria.

Effect	**Duration**	
	Short term	Less than 5 years
	Medium term	Between 5-20 years
	Long term	More than 20 years
	Permanent	Over 40 years or resulting in a permanent and lasting loss
	Extent	
	Localised	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
	Study area	The proposed site and its immediate surroundings.
	Municipal	Impacts effect on the Local and District Municipalities.
	Regional	Impacts affect the wider area or the Northern Cape Province as a whole.
	National	Impacts affect the entire country.
	International/Global	Impacts affect other countries or have a global influence.
	Consequence	

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

Table 9-2: Impacts Severity Rating

Impact severity *(The severity of negative impacts, or how beneficial positive impacts would be on a affected system or affected party)*	
Very severe	**Very beneficial**
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.
Severe	**Beneficial**
Long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example an increase in the local economy.
Moderately severe	**Moderately beneficial**
Medium to long term impacts on the affected system(s) or party (ies), which could be mitigated. For example constructing a sewage treatment facility where there was vegetation with a low conservation value.	A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For example a 'slight' improvement in sewage effluent quality.
Slight	**Slightly beneficial**
Medium or short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
No effect	**Don't know/Can't know**

The system(s) or party(ies) is not affected by the proposed development.	In certain cases it may not be possible to determine the severity of an impact.

Table 9-3: Overall Significance Rating

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

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

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

9.1.1 CUMULATIVE IMPACT APPROACH

While individual development activities can have minor impacts, the combined impacts of many developments can have serious local, regional, and even global repercussions. In this regard, Appendix 3 section 3 on the EIA process included in the 2014 EIA Regulations as amended in 2017, indicates that an EIR must contain information that is necessary for the Competent Authority to consider and come to a decision on an application and must include:

(j) An assessment of each identified potentially significant impact and risk, including: (i) cumulative impacts.

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

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

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

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

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

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

For the purposes of the current CEA, high reliance was placed on the results of the various specialist studies, where a specific requirement for each was to identify and assess the contribution of the proposed Soyuz 1 WEF to the cumulative impacts on the affected environment.

The properties affected by the Soyuz 1 WEF are zoned as agriculture. The current land-use includes agriculture in the form of livestock and game farming. Surrounding land-uses include game farms (photographic and hunting safaris), other proposed WEFs, roads, open space / natural areas, mining areas, and other agricultural land.

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 birds and bats; and
- 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 100 km radius around it, the following WEFs are applicable:

- Soyuz 2 WEF (DFFE Ref: TBA)
- Soyuz 3 WEF (DFFE Ref: TBA)
- Soyuz 4 WEF (DFFE Ref: TBA)
- Soyuz 5 WEF (DFFE Ref: TBA)
- Soyuz 6 WEF (DFFE Ref: TBA)
- Taaibos North WEF (DFFE Ref: TBA)
- Taaibos South WEF (DFFE Ref: TBA)
- Soutrivier Central WEF (DFFE Ref: TBA)
- Soutrivier South 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)
- De Aar Wind Energy Facility 1 (DFFE Ref: 12/12/20/2463/1)
- De Aar Wind Energy Facility 2 (DFFE Ref: 12/12/20/2463/2)

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.

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 with regards to birds / 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.

9.1.2 No-go Alternative Impact Approach

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.

The status quo for the proposed Soyuz 1 WEF site would include the following:

IMMEDIATE AREA OF THE PROPOSED WEF:

- Livestock grazing (proposed WEF would have a negligible impact);
- Game farming (proposed WEF would have a negligible impact);
- Alien vegetation (proposed WEF would have a positive impact);
- Ecological processes (proposed WEF would have a negative impact)

ADJACENT AREA OF THE PROPOSED WEF:

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

9.2 General Impacts

Table 9-5 contains the general impacts associated with the proposed Soyuz 1 WEF. This table includes direct/indirect impacts, cumulative impacts and no-go alternatives for each impact identified. This table includes the issues, impacts, nature, pre-mitigation significance and post-mitigation significance. The full assessment of each impact as per Tables 9-4 and 9-5 above can be found in Appendix H of this Report. These tables contain full mitigation measures and include duration, extent, consequence, probability, reversibility of each impact. For the summary related to Specialist Impacts, please see Section 9.3.

9.2.1 General Impacts Calculations

Figure 9-1 (pre-mitigation) and Figure 9-2 (post mitigation) summarises the direct/indirect and cumulative impacts. Of the 55 direct/indirect and cumulative impacts identified and assessed as general impacts, most of the impacts are of a MODERATE negative significance pre-mitigation (62%) and LOW negative post-mitigation (84%). There are sixteen (16) HIGH negative significance pre-mitigation and NO high negative significance post-mitigation. There are four (4) positive impacts, two of a HIGH and two of a LOW positive significance.

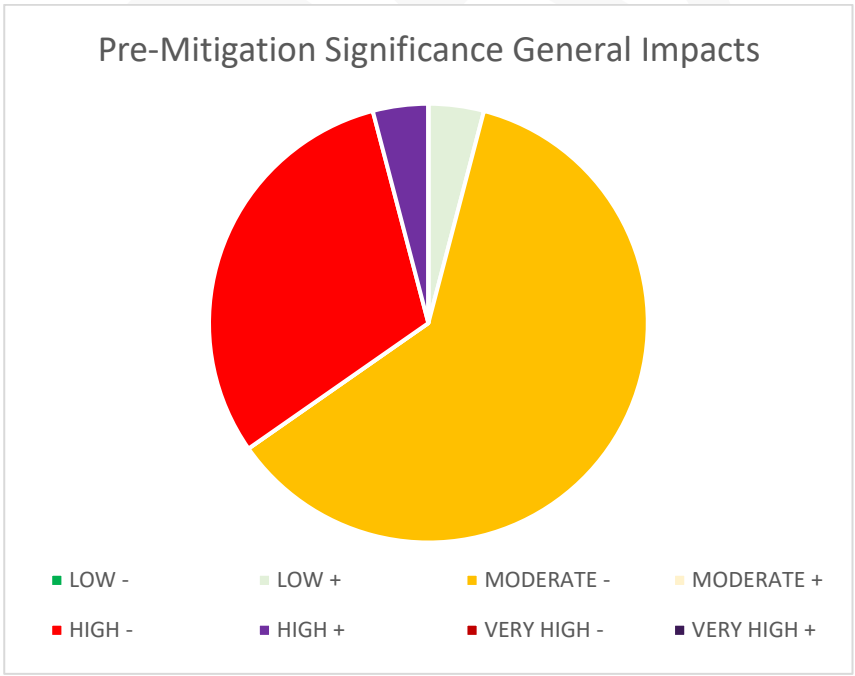


Figure 9-1: Chart Representation of General Direct and Indirect Impacts Significance, Pre-mitigation

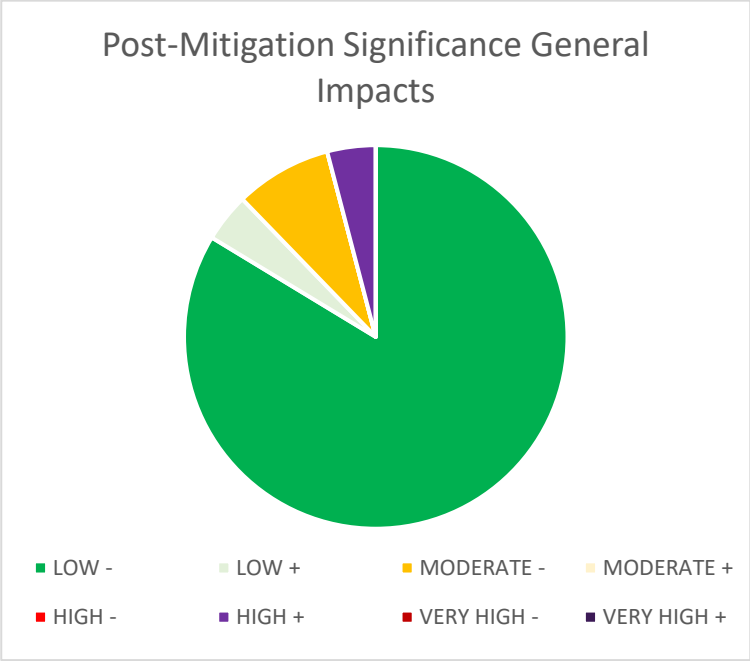


Figure 9-2: Chart Representation of General Direct and Indirect Impacts Significance, Post-mitigation

Table 9-4: General Impacts, pre- and post-mitigation significance, and mitigation measures.

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
PLANNING & DESIGN PHASE					
GENERAL IMPACTS					
STORAGE OF HAZARDOUS SUBSTANCES	Inappropriate planning for the storage of hazardous substances such as diesel, paint, pesticides, etc, tools and equipment used on site could lead to surface and ground water pollution e.g. due to oil leaks, spillage of diesel etc. In addition, these hazardous substances could be washed off into nearby drainage lines. The mixing of cement on site could result in ground water contamination from compounds in the cement. In addition, a large number of cement mixing stations on site could increase the presence of impermeable areas which in turn could increase rates of run-off and thereby increase the risk of localized flooding, soil erosion, silting, gully formation, etc. The proposed BESS will not trigger this activity as it will be assembled off-site. *Cumulative impact would be high should the storage of hazardous good be non-compliant for the neighbouring Soyuz WEF cluster. However, they are being proposed by the same developer and risk mitigation measures and management process will be aligned in all EMPrs.* *No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.*	**DIRECT**	**MODERATE -**	• *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 the designated construction camps and/or satellite laydown areas, where practical. This mixing must take place on an impermeable surface, and dried waste cement must be disposed of with building rubble.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		
ENVIRONMENTAL LEGAL AND POLICY COMPLIANCE	Failure to adhere to existing policies and legal obligations could lead to the project conflicting with local, provincial and national policies, guidelines and legislation. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	**DIRECT**	**HIGH -**	• *Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy.* • *These must include (but not restricted to):* ▪ *Local and District Spatial Development Frameworks* ▪ *Local Municipal bylaws*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**LOW -**		**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	Cumulative impact would be high as there are a range of renewable energy facilities proposed within the greater area. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative could result in landowners looking at other avenues of potential income which would need to comply with environmental law and policy.*			• *In addition, planning for the construction and operation of the proposed energy facility must consider available best practice guidelines.*	
STORMWATER MANAGEMENT AND EROSION	The introduction of roads and impermeable areas could increase rates of run-off and therefore the risk of localised flooding. *Cumulative impact would be moderate as there are a range of activities, including roads, which contribute to erosion at localised levels. However, these activities are not prevalent in the area.* *No-go alternative would still present a level of stormwater runoff and erosion due to current farming activities and existing impermeable surfaces.*	**INDIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** **MODERATE -** **LOW -**	• *A Stormwater Management Plan must be designed and implemented to ensure maximum water seepage at the source of water flow.* • *The plan must also include management mitigation measures for water pollution, wastewater management and the management of surface erosion e.g. by considering the applicability of contouring, etc.* • *An Erosion Management Plan must be designed and implemented to ensure minimal impact.*	**LOW -** **LOW -** **LOW -**
MANAGEMENT OF GENERAL WASTE	Inappropriate planning for management and disposal of waste e.g. storage disposal could result in surface and ground water contamination. *Cumulative impact, on a localised scale, would be high should the full Soyuz WEF cluster construction timelines overlap. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **NO IMPACT**	• *Develop and implement a Waste Management Plan for handling on site waste.* • *Designate an appropriate area where waste can be stored before disposal.* • *General Waste must be disposed of at a registered landfill site.*	**LOW -** **LOW -**
SCHEDULING OF CONSTRUCTION	Construction scheduling that does not take into account the seasonal requirements of the aquatic environment, e.g.	**INDIRECT** **CUMULATIVE**	**MODERATE -** **HIGH -**	• *Wherever possible, construction activities must be undertaken during the driest part of the year to*	**LOW -** **LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	allowing for unimpeded flood events, could lead to short-term (and potentially long-term) impacts such as excessive sediment mobilization, etc. *Cumulative impact, on a localised scale, would be high should the full Soyuz WEF cluster construction timelines overlap. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to construction scheduling as no other construction, that we are aware of, is planned on site.*			*minimize downstream sedimentation due to excavation, etc.* • *When not possible, suitable stream diversions structures must be used to ensure that rivers/streams are not negatively impacted by construction activity.*	
		NO-GO	**NO IMPACT**		
CONSTRUCTION PHASE					
GENERAL IMPACTS					
NUISANCE DUST	Dust is likely to be a potential nuisance due to the construction activities. *Cumulative impact, on a localised scale, would be high should the full Soyuz WEF cluster construction timelines overlap. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to construction nuisance dust as no other construction activties, that we are aware of, are planned on site.*	**DIRECT**	**MODERATE -**	• *Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following:* ▪ *Damping down of un-surfaced and un-vegetated areas;* ▪ *Retention of vegetation where possible;* ▪ *Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;* ▪ *A speed limit of 40km/h must not be exceeded on dirt roads;* • *Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		
FIRE	Risk of runaway fires from construction activities related to having people on site, such as cooking, smoking or burning of	**DIRECT**	**HIGH -**	• *There must be no burning of construction waste or debris onsite.*	**MODERATE -**
		CUMULATIVE	**HIGH -**		**MODERATE -**
		NO-GO	**HIGH -**		**MODERATE -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	vegetation might lead to the burning of surrounding vegetation. *Cumulative impact would be high should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would still retain a fire risk as fires are a natural occurrence.*			• *Cooking and burning of vegetation is not permitted on site.* • *Smoking on site must be confined to a designated area in the vicinity of the site office which must be equipped with the necessary fire extinguishers.* • *Develop and implement a Fire Management Plan.*	
STORMWATER MANAGEMENT	Sediment is likely to be created during construction. This could be washed off into the nearby drainage line e.g. during the excavation of foundations, the laying of access roads within the site, digging of cable runs and soil stripping and stockpiling to create foundations and temporary areas of hard-standing, such as the construction camp. *Cumulative impact would be high should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would still present a level of stormwater runoff and erosion due to current farming activities and existing impermeable surfaces.*	**DIRECT**	**MODERATE -**	• *The recommendations of the Stormwater Management Plan must be implemented to avoid soil erosion and siltation of drainage line.* • *The recommendations of the Erosion Management Plan must be implemented to reduce the risk of soil erosion.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**LOW -**		**LOW -**
DEGRADATION OF DRAINAGE LINES FROM EARTHWORKS	Unplanned construction activities or earthworks that occur close to onsite drainage lines could cause adverse impacts such as soil erosion, siltation, and blockage of the drainage line. *Cumulative impact would be high should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated*	**DIRECT**	**HIGH -**	• *There must be no earthworks, apart from roadworks inclusive of culverts, within 32m of the drainage lines to avoid contamination of water sources.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would have no impact as there are currently no earthworks activities on site that we are aware of.*				
MANAGEMENT OF GENERAL WASTE	Littering by construction workers could cause surface and ground water pollution. *Cumulative impact would be high should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	**INDIRECT**	**MODERATE -**	• *A Waste Management Plan, incorporating recycling and waste minimisation, must be implemented. The Waste Management Plan must be explained to all employees as part of the environmental induction training.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		
HAZARDOUS SUBSTANCES	Onsite maintenance of construction vehicles/machinery and equipment could result in oil, diesel and other hazardous chemicals contaminating surface and ground water. Surface and ground water pollution could arise from the spillage or leaking of diesel, lubricants and cement during construction activities. *Cumulative impact would be null as no other new activities, which include the use of hazardous substances are planned for this site (localised impact).* *No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.*	**DIRECT**	**MODERATE -**	• *The storage of fuels and hazardous materials must be located away from sensitive water resources.* • *All hazardous substances (e.g. diesel, oil drums, etc.) must be stored in a bunded area.* • *The recommendations of the Stormwater Management Plan and the Waste Management Plan must be implemented during construction.*	**LOW -**
		CUMULATIVE	**NO IMPACT**		
		NO-GO	**NO IMPACT**		
MANAGEMENT OF CONSTRUCTION WASTE	Waste from construction activities e.g. excess concrete and cement mixture, empty paint containers, oil containers, etc., could cause pollution of ground and surface water when they come into contact with run-off water.	**DIRECT**	**MODERATE -**	• *A Waste Management Plan for the project must be developed and implemented in the construction phase.* • *All waste must be disposed of at an appropriately licensed landfill site.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	Cumulative impact would be moderate should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to construction waste as the site does not currently have any construction activities taking place.*			• *All construction materials must be stored in a central and secure locations with controlled access with an appropriate impermeable surface.* • *The recommendations of the Stormwater Management Plan must be implemented to mitigate the impacts of run-off water on pollution.*	
		NO-GO	**NO IMPACT**		
WATER QUALITY	Wet concrete is highly alkaline. This could result in flash kills of macroinvertebrates and fish species in the vicinity. Soil erosion will decrease the quality of the aquatic habitat downstream of the construction activities by silting over exposed rocks and decreasing the clarity and oxygen saturation of the water. Soil erosion will decrease the quality of the aquatic habitat downstream of the construction activities by silting over exposed rocks and decreasing the clarity and oxygen saturation of the water. *Cumulative impact would be high should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to concrete contamination of watercourses as the site does not currently have any construction activities taking place.*	**DIRECT**	**MODERATE -**	• *No concrete mixing will take place within 32m of any watercourse.* • *The concrete batching plant must be clearly demarcated, and no sprawl must be tolerated.*	**LOW -**
		CUMULATIVE	**HIGH -**		**LOW -**
		NO-GO	**NO IMPACT**		
INFILLING/ EXCAVATION IN A WATERCOURSE	Excavated material stockpiles may increase sediment loads in watercourses during rainfall events. Materials used for the infilling of watercourses in order to construct water crossings may not be compatible with the surrounding bed/banks, etc., which could change the characteristics of the watercourse.	**INDIRECT**	**MODERATE -**	• *Stockpiled excavated material must not be stored within 32m of a watercourse.* • *Stockpile areas must be suitably bunded to prevent waterborne erosion of exposed soils where there is a likelihood that the soils will be washed into a watercourse.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	Cumulative impact would be moderate should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to excavated stockpiles as the site does not currently have any construction activities taking place.*			• *Materials used for infilling must be suitably stabilized to ensure that scour and erosion of the existing bed/banks is exacerbated.*	
		NO-GO	**NO IMPACT**		
DISPOSAL OF SPOIL MATERIAL	Incorrect disposal of subsoil/spoil material could result in significant loss of a useful resource. *Cumulative impact would be moderate should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to disposal of spoil materials as the site does not currently have any construction activities taking place.*	**DIRECT**	**MODERATE -**	• *Subsoil cannot be disposed of onsite without the appropriate Waste License in terms of the NEMA: Waste Act.* • *Spoil could be used to rehabilitate open borrow pits or erosion features.* • *Disposal of spoil material to a registered landfill must be the last option.* • *No spoil stockpiles will be allowed to remain onsite once construction activities have ceased.*	**LOW -**
		CUMULATIVE	**MODERATE-**		**LOW -**
		NO-GO	**NO IMPACT**		
OPERATIONAL PHASE					
GENERAL IMPACTS					
AIR QUALITY CLIMATE CHANGE	The electricity generated by the development will displace some of that produced by fossil fuel-based forms of electricity generation. The scheme, over its lifetime, will therefore avoid the production of a significant amount of CO_2, SO_2 and NO_2 that would otherwise be emitted to the atmosphere. *Cumulative impact, on a localised scale, would be high as the area has a number of renewable energy facilities proposed, inclusive of the 6 Soyuz WEF cluster.* *No-go alternative would result in a low negative impact as local power would not be offset by additional renewable energy.*	**DIRECT**	**HIGH +**	• *Enhance this impact by promoting the use of renewable energy locally.*	**HIGH +**
		CUMULATIVE	**HIGH +**		**HIGH +**
		NO-GO	**LOW -**		**LOW -**
		DIRECT	**MODERATE -**		**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
ARCHITECTURE OF ANCILLARY INFRASTRUCTURE	Control buildings, toilet facilities and other ancillary infrastructure could cause negative visual intrusion if allowed to fall into disrepair and not maintained properly. *Cumulative impact would be moderate should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to architecture of ancillary infrastructure.*			• *All project structures and buildings must be maintained.*	
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		
HAZARDOUS CHEMICAL STORAGE	Inappropriate storage of chemical, herbicides, diesel and other hazardous substances on site could result in soil and water contamination and pose a high accident danger risk. *Cumulative impact would be high should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.*	**DIRECT**	**HIGH -**	• *All hazardous substances must be stored in appropriately bunded locations.*	**MODERATE -**
		CUMULATIVE	**HIGH -**		**MODERATE -**
		NO-GO	**NO IMPACT**		
INCREASED STORMWATER RUN-OFF	Failure to maintain the stormwater system could increase the risk of surface water damage to the landscape and vegetation from increased rates of run-off and therefore the risk of localised flooding and increased sheet erosion downstream due to the presence of roads and impermeable areas of hard standing. *Cumulative impact would be moderate should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated*	**DIRECT**	**MODERATE -**	• *Recommendations of the Stormwater Management Plan and Erosion Management Plan must be implemented.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**LOW -**		**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would still present a level of stormwater runoff and erosion due to current farming activities and existing impermeable surfaces.*				
WASTE MANAGEMENT	There could be littering by maintenance workers and security personnel on site. *Cumulative impact would be moderate should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	**DIRECT** **CUMULATIVE**	**MODERATE -** **MODERATE -**	▲ *A Waste Management Plan, incorporating recycling and waste minimisation, must be implemented. The Waste Management Plan must be implemented throughout the operational phase.*	**LOW -** **LOW -**
		NO-GO	**NO IMPACT**		
DECOMMISSIONING PHASE					
GENERAL IMPACTS					
POLLUTION	Littering by construction workers could cause surface and ground water pollution. *Cumulative impact would be moderate should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.*	**DIRECT** **CUMULATIVE**	**MODERATE -** **MODERATE -**	▲ *Littering must be avoided, and litter bins must be made available at various strategic points on site.* ▲ *Refuse from the decommissioning of the site must be collected on a regular basis and deposited at an appropriate landfill.*	**LOW -** **LOW -**
		NO-GO	**NO IMPACT**		
	Onsite maintenance of construction vehicles/machinery and equipment could result in oil, diesel and other hazardous chemicals contaminating surface and ground water. Surface	**DIRECT** **CUMULATIVE**	**MODERATE -** **MODERATE -**	▲ *No storage of fuels and hazardous materials must be permitted near sensitive water resources. All hazardous substances (e.g. diesel, oil drums, etc.) to be stored in a bunded area.*	**LOW -** **LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	and ground water pollution could arise from the spillage or leaking of diesel, lubricants, etc. during decommissioning. *Cumulative impact would be moderate should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.*	**NO-GO**	**NO IMPACT**		
DUST	Dust is likely to be a potential nuisance due to the decommissioning activities. *Cumulative impact would be moderate should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact related to decommissioning nuisance dust as no other decommissioning activities should be taking place on the site, that we are aware of.*	**DIRECT**	**MODERATE -**	*Management of fugitive/nuisance dust could be implemented through the following:* ▪ *Damping down of un-surfaced and un-vegetated areas;* ▪ *Retention of vegetation where possible; Demolitions and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;* ▪ *A speed limit of 40km/h must not be exceeded on dirt roads.* *Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.*	**LOW -**
		CUMULATIVE	**MODERATE-**		**LOW -**
		NO-GO	**NO IMPACT**		
SOIL EROSION	After the removal of all wind turbine related structures, the disturbed soils could become exposed, unstable and prone to erosion. *Cumulative impact would be moderate should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated*	**DIRECT**	**MODERATE -**	*After the removal of all wind turbine-related structures, the disturbed soils must be re-vegetated to avoid unnecessary soil erosion. This must be based on the Revegetation Plan and the Erosion Management Plan.*	**LOW -**
		CUMULATIVE	**MODERATE -**		**LOW -**
		NO-GO	**NO IMPACT**		

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard. *No-go alternative would result in no impact related to soil erosion as a result of turbine removal as no other WEFs are planned on this site.*				
LAND-USE	Land previously unavailable for certain types of land use will now be available for those uses. *Cumulative impact would be low should the Soyuz WEF cluster be constructed during the same period. However, it is important to note that the 6 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.* *No-go alternative would result in no impact as the site will return to what it was used for before, i.e. the current status quo.*	**DIRECT**	**LOW +**	*No mitigation necessary*	**LOW +**
		CUMULATIVE	**LOW +**		**LOW +**
		NO-GO	**NO IMPACT**		

9.3 SPECIALIST IMPACTS

Table 9-6 contains the specialist impacts associated with the proposed Soyuz 1 WEF. This table includes direct/indirect impacts, cumulative impacts and no-go alternatives for each impact identified. This table includes the issues, impacts, nature, pre-mitigation significance and post-mitigation significance. The full assessment of each impact as per Table 9-6 can be found in Appendix H of this Report and in each individual Specialist Report, Appendix E. These tables contain full mitigation measures and include duration, extent, consequence, probability, reversibility of each impact. For the summary related to General Impacts, please see Section 9.2.

9.3.1 SPECIALIST IMPACTS CALCULATIONS

Figure 9-3 (pre-mitigation) and Figure 9-4 (post mitigation) summarises the direct/indirect and cumulative specialist impacts. Of the 156 negative impacts 62 are mitigated from HIGH/MODERATE to LOW negative post-mitigation significance.

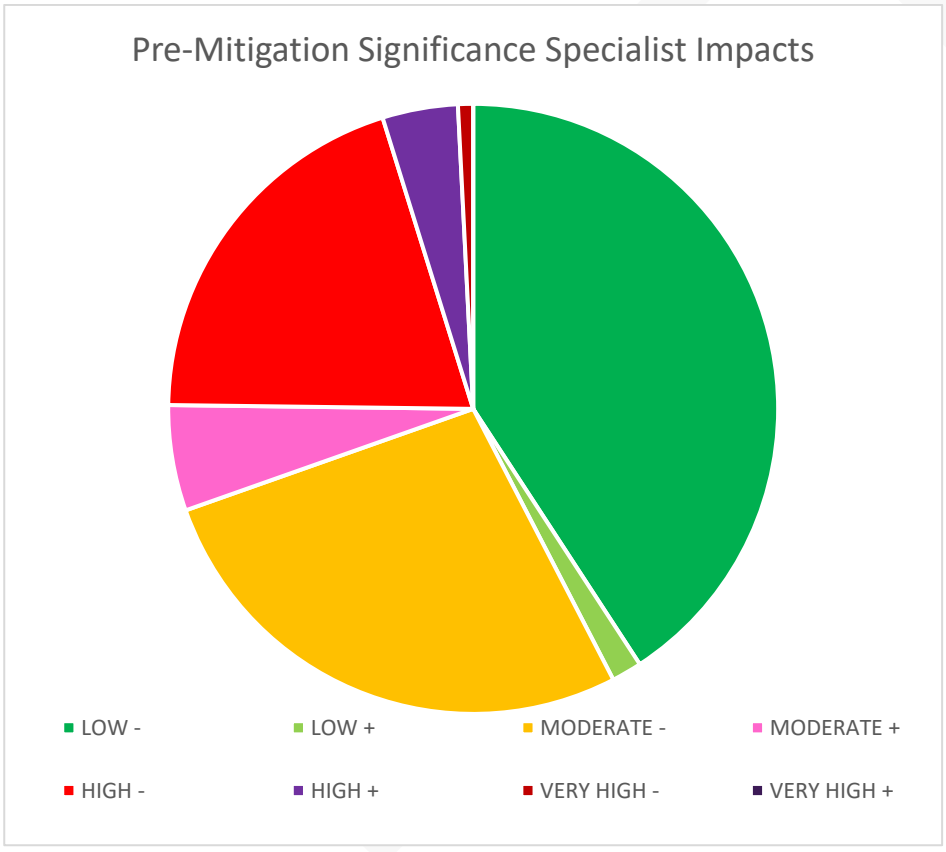


Figure 9-3: Chart Representation of Specialist Direct and Indirect Impacts Significance, Pre-mitigation

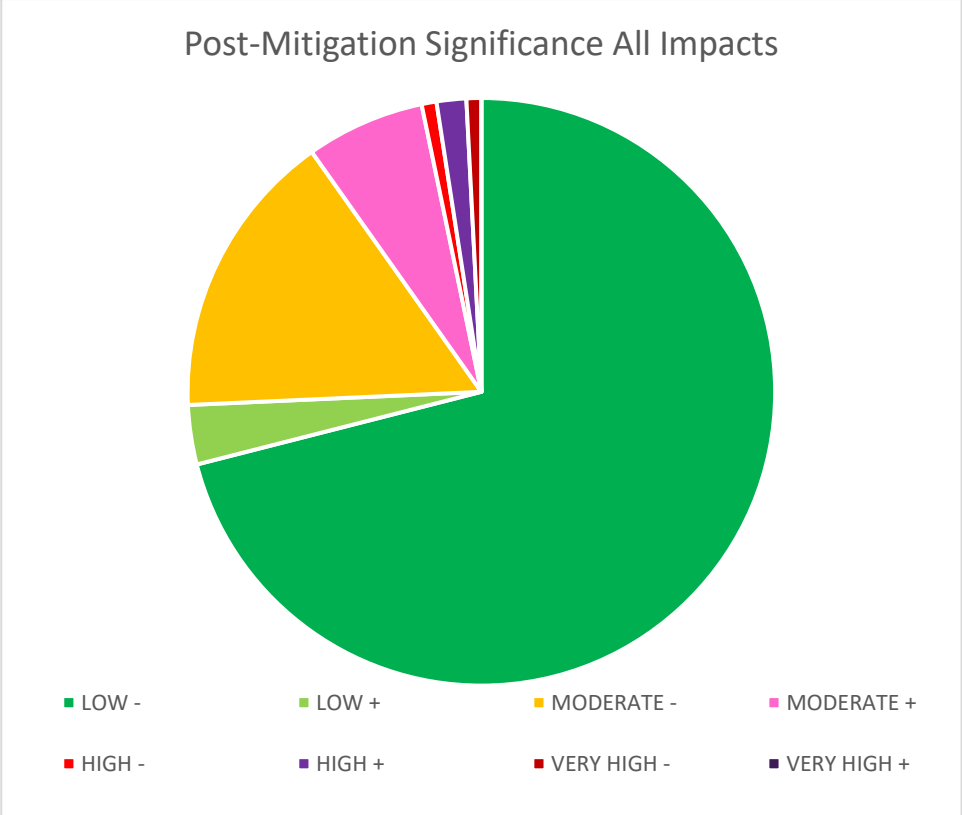


Figure 9-4: Chart Representation of Specialist Direct and Indirect Impacts Significance, Post-mitigation.

Table 9-5: Specialist Impacts, pre- and post-mitigation significance, and mitigation measures.

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

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
REDUCTION OF LAND WITH NATURAL VEGETATION FOR LIVESTOCK GRAZING	The availability of grazing land that can be used for small stock farming will be reduced during the construction phase. It is anticipated that the impact will remain as long the infrastructure is present, and the impact will only cease once all surface infrastructure has been decommissioned and vegetation has re-established in these areas.	**DIRECT**	**LOW -**	• *Vegetation clearance must be restricted to infrastructure and access road areas.* • *Materials and equipment must only be stored in the pre-determined laydown areas.* • *Prior arrangements must be made with the landowner and neighbouring landowners to ensure that farm and game animals are moved to areas where they cannot be injured by vehicles traversing the area.* • *No boundary fence must be opened without the landowner or neighbouring landowners' permission.* • *No open fires made by the construction teams are allowable during the construction phase.* • *The supporting infrastructure must be constructed as closely as possible together to avoid fragmentation of the entire project site.*	**LOW -**
SOIL EROSION	The clearing and levelling of a limited area of land within the proposed project site will increase the risk of soil erosion in the area. It is anticipated that the risk will naturally reduce as grass and lower shrubs re-establishes in the area once the	**DIRECT**	**MODERATE -**	• *Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude;* • *Unnecessary land clearance must be avoided;* • *Level any remaining soil*	**LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	construction has been completed and the operation phase commences.			*removed from excavation pits that remained on the surface instead of allowing small stockpiles of soil to remain on the surface.* • *Regularly monitor the site to check for areas where signs of soil erosion may start to appear.* • *Should any soil erosion be detected, it must be addressed immediately through rehabilitation and surface stabilisation techniques*	
SOIL EROSION	Any additional wind energy facilities or other renewable projects to be developed in the area, will result in additional areas where exposed to soil erosion through wind and water movement.	**CUMULATIVE**	**MODERATE -**	• *Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude;* • *Unnecessary land clearance must be avoided;* • *Level any remaining soil removed from excavation pits that remained on the surface instead of allowing small stockpiles of soil to remain on the surface.* • *Regularly monitor the site to check for areas where signs of soil erosion may start to appear.* • *Should any soil erosion be detected, it must be addressed immediately through*	**LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
				rehabilitation and surface stabilisation techniques	
SOIL POLLUTION	The following construction activities can result in the chemical pollution of the soil: 1. Petroleum hydrocarbon (present in oil and diesel) spills by machinery and vehicles during earthworks and the removal of vegetation as part of site preparation. 2. Spills from vehicles transporting workers, equipment, and construction material to and from the construction site. 3. The accidental spills from temporary chemical toilets used by construction workers. 4. The generation of domestic waste by construction workers. 5. Spills from fuel storage tanks during construction. 6. Pollution from concrete mixing. 7. Any construction material remaining within the construction area once construction is completed.	**DIRECT**	**LOW -**	• *Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills;* • *Any waste generated during construction, must be stored in designated containers, and removed from the site by the construction teams; and* • *Any left-over construction materials must be removed from site.*	**LOW-**
SOIL POLLUTION	Increase in areas susceptible to soil pollution.	**CUMULATIVE**	**LOW -**	• *Maintenance must be undertaken regularly on all vehicles and*	**LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
				construction/maintenance machinery to prevent hydrocarbon spills; • *Any waste generated during construction, must be stored in designated containers and removed from the site by the construction teams; and* • *Any left-over construction materials must be removed from site.*	
SOIL COMPACTION	The clearing and levelling of land for the wind turbines and supporting infrastructure as well as the access roads, will result in soil compaction. In the area where the access road will be constructed, topsoil will be removed and the remaining soil material will be deliberately compacted to ensure a stable road surface.	**DIRECT**	**MODERATE -**	• *Vehicles and equipment must travel within demarcated areas and not outside of the construction footprint;* • *Unnecessary land clearance must be avoided;* • *Where possible, conduct the construction activities outside of the rainy season; and* • *Vehicles and equipment must park in designated parking areas.*	**LOW -**
SOIL COMPACTION	Increase in areas with compacted soils.	**CUMULATIVE**	**MODERATE -**	• *Vehicles and equipment must travel within demarcated areas and not outside of the construction footprint;* • *Unnecessary land clearance must be avoided;* • *Where possible, conduct the construction activities outside of the rainy season; and*	**LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
				▲ *Vehicles and equipment must park in designated parking areas.*	
AQUATIC IMPACT ASSESSMENT					
DIRECT ECOSYSTEM MODIFICATION OR DESTRUCTION / LOSS IMPACTS	Direct, permanent modification and/or loss of up to 1.20 ha for the construction of two turbines within the prescribed buffers of A02 and A07. This includes 1 024 m2 for each concrete turbine foundation and 5 000 m2 for the permanent crane hardstand / blade and tower laydown area / crane boom erection area at each turbine.	**DIRECT**	**MODERATE -**	***Avoid/prevent:*** ▲ *The following buffers should be applied to all watercourses and wetlands (i.e. channelled drainage lines and longitudinal washes) based on their EIS rating:* ○ *High EIS – 50 m;* ○ *Moderate to moderately-high EIS – 30 m; and* ○ *Moderately-low EIS – 15 m* ▲ *No turbines or pylons should be placed within these watercourses or their buffers* ▲ *In accordance with the best practice guidelines, unnecessary watercourse powerline and road crossings (i.e. proposed crossings that can be re-aligned) must be re-aligned and avoided.* ▲ *Construction materials must not be stored within the moderate to high EIS areas or their buffers.* ▲ *Stockpiles must not be stored within the moderate to high sensitivity areas or their buffers.* ***Minimize/reduce:*** ▲ *Construction activities should be*	**LOW -**
	Direct, permanent modification and/or loss of 0.36 ha for the construction of 12 m wide access roads through A02 and A07.	**DIRECT**	**LOW**		LOW -
ALTERATION OF HYDROLOGICAL AND GEOMORPHOLOGICAL PROCESSES	Localised, long-term alteration of hydrology and geomorphology of watercourses A02 and A07 in the vicinity of the proposed turbines due to construction. This will include localised infilling, surface compaction and hardening, as well as changes to local run-off, erosion and sedimentation.	**INDIRECT**	**LOW -**		**LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	Localised, long-term alteration of hydrology and geomorphology of watercourses A02 and A07 at and downstream of the new and/or upgraded access road crossings during construction.	**INDIRECT**	**LOW -**	*undertaken during the driest part of the year to minimize erosion and downstream sedimentation due to excavation, etc.* • *Appropriate stormwater structures must be implemented during construction to control run-off and minimize erosion.* • *Vegetation clearing must be kept a minimum and only to the site footprint.* • *Erosion controls and sediment trapping measures must be put in place.* • *Stockpiles must be monitored for erosion and mobilisation of materials towards watercourses.* • *Stockpiles must not exceed 1.5m in height. Stockpiles must be covered during windy periods.* • *Best practice powerline and access road crossing alignment measures must be implemented.* • *Where watercourse crossings are required, every effort should be made to minimize the impacts by considering the following:* ○ *Crossing points should be aligned along areas or corridors of existing disturbance e.g. along existing road crossings.*	**LOW -**
ECOLOGICAL CONNECTIVITY AND EDGE DISTURBANCE IMPACTS	Temporary reduction of ecological connectivity between up- and downstream sections of high EIS watercourses (A02 and A07) during construction of access road crossings.	**DIRECT**	**LOW -**		**VERY LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
				○ *The length of watercourse at each crossing must be minimised by adjusting alignments to coincide with narrower sections and ensuring that crossings cross perpendicular to flow.* ***Remediate/rehabilitate:*** ➢ *Disturbed areas must be monitored for erosion channels and these must be rehabilitated.* ➢ *All trenches/excavations must be backfilled and all disturbed areas backfilled, compacted and revegetated, where applicable.* ➢ *Road crossings should be used to assist in re-instating some of the lost base level as a result of historical erosional incision. The proposed access roads should serve a dual function, namely as a crossing of the washes and a means of stabilising the longitudinal slope of the watercourses.* ➢ *Anchored brush packs should be used in Badlands to assist with their rehabilitation.* ➢ *Within Soyuz 1, targeted rehabilitation at road crossings should be concentrated within units A02 and A07 in particular. Several*	

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
				other assessment units within the broader WEF cluster can also be targeted for rehabilitation.	
WATER POLLUTION IMPACTS	Pollution of watercourses due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.	**DIRECT**	**LOW -**	**Avoid/prevent:** • No concrete mixing must take place within 50 m of any watercourse. • No machinery must be parked overnight within 50 m of the watercourses. • All stationary machinery must be equipped with a drip tray to retain any oil leaks. • Chemicals used for construction must be stored safely on bunded surfaces in the construction site camp. • No ablution facilities must be located within 50 m of any watercourse. • Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution. • Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it. • All general waste and refuse must be removed from site and disposed and windproof temporary storage area before being disposed of at a registered landfill site.	**VERY LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
				Remediate/rehabilitate: • Emergency plans must be in place in case of spillages onto bare soil or within watercourses.	
CUMULATIVE DIRECT IMPACTS	Cumulative direct modification and/or loss of up to 16.78 ha of watercourse units across the entire Soyuz WEF Cluster during the construction phase. This includes 0.31 ha to turbine foundations, 1.50 ha to hardstands, 14.46 ha to 12 m wide access roads and 0.51 ha to satellite camps.	**DIRECT, CUMULATIVE**	**MODERATELY HIGH -**	• Application of all recommended mitigation measures to avoid, minimize and rehabilitate impacts across all WEF projects within the Soyuz Cluster.	**MODERATELY LOW -**
CUMULATIVE INDIRECT IMPACTS	Cumulative widespread, permanent alteration of hydrological and geomorphological processes within watercourses across the entire Soyuz WEF Cluster at and downstream of the proposed infrastructure.	**INDIRECT, CUMULATIVE**	**MODERATE -**		**LOW -**
NO-GO: ALTERATION OF HYDROLOGICAL AND GEOMORPHOLOGICAL PROCESSES	NO-GO IMPACT: Ongoing alteration and disturbance of the watercourses over the long-term, due to widespread overgrazing, cultivation and other land uses, as well as more localised disturbances such as the use of existing access roads, collectively leading to decreased vegetation cover and increased	**NO-GO: INDIRECT, CUMULATIVE**	**LOW -**	• Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing authority to implement measures to address existing impacts.	

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	run-off, erosion and sedimentation, particularly during storm and flood events				
NO-GO: ECOLOGICAL CONNECTIVITY AND EDGE DISTURBANCE IMPACTS	Reduction of ecological connectivity between sections of watercourse units at and downstream over the long-term due to existing land uses.	**NO-GO: INDIRECT, CUMULATIVE**	**LOW -**	⅄ Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing authority to implement measures to address existing impacts.	
NO-GO: WATER POLLUTION IMPACTS	Reduction of water quality over the long-term due to existing land uses (particularly livestock grazing and cultivation), as well as ongoing erosion and sedimentation of watercourses.	**NO-GO: INDIRECT, CUMULATIVE**	**LOW -**	⅄ Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing authority to implement measures to address existing impacts.	
AVIFAUNAL IMPACT ASSESSMENT					
DIRECT HABITAT DESTRUCTION	Direct habitat destruction associated with WEFs is generally low relative to the overall size of the project area. This impact is largely unavoidable, resulting in some birds being displaced from the project site.	**DIRECT**	**LOW -**	⅄ *The footprint within Medium and High Sensitivity areas must be minimized and avoided wherever possible;* ⅄ *Laydown and other temporary infrastructure to be placed outside of Medium and High sensitivity areas, preferably within previously transformed areas, wherever*	**LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
				possible; • *Appropriate run-off and erosion control measures must be implemented where required;* • *A site-specific Environmental Management Programme (EMPr) must be developed and implemented. The EMPr must give appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction of habitat (e.g. no open fires outside of designated areas);* • *All contractors are to adhere to the EMPr and must apply good environmental practice during construction;* • *All hazardous materials must be stored in the appropriate manner to prevent contamination of the site and downstream environments. Any accidental chemical, fuel and oil spills that occur at the site must be cleared as appropriate for the nature of the spill;* • *Existing roads and farm tracks must be used where possible;*	

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
				• *The minimum footprint areas of infrastructure must be used wherever possible, including road widths and lengths;* • *No off-road driving must be permitted in areas not identified for clearing;* • *An Environmental Officer (EO) must form part of the on-site team to ensure that the EMPr is implemented and enforced and an Environmental Control Officer (ECO) must be appointed to oversee the implementation activities and monitor compliance for the duration of the construction phase; and* • *Following construction, rehabilitation of areas disturbed by temporary laydown areas and facilities must be undertaken.*	
DISTURBANCE AND DISPLACEMENT	Indirect loss of habitat from disturbance during the construction phase is temporary in nature and is expected to result largely from the presence of heavy machinery and increased activity of construction personnel.	**DIRECT**	**LOW -**	• *A site specific EMPr must be developed and implemented. The EMPr must give appropriate and detailed description of how construction activities must be conducted;* • *All contractors are to adhere to the*	**LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
				EMPr and must apply good environmental practice during construction; • *The ECO must oversee activities and ensure that the site specific EMPr is implemented and enforced;* • *Maximum use of existing access road and servitudes;* • *Existing and novel access roads are to be suitably upgraded or constructed to prevent damage and erosion resulting from increased vehicular traffic and construction vehicles;* • *No off-road driving in undesignated areas;* • *Speed limits (50 km/h) must be strictly enforced on site to reduce unnecessary noise;* • *COnstruction camps must be lit with as little light as practically possible, with the lights directed downwards where appropriate;* • *The movement of construction personnel must be restricted to the*	

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
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				construction areas on the project site; • *No dogs or cats other than those of the landowners must be allowed on site;* • *The appointed ECO must be trained to identify the potential Red Data species, as well as the signs that indicate possible breeding by these species;* • *The ECO must during audits/site visits make a concerted effort to look out for such breeding activities of SCCs (e.g. cranes, Secretarybird). Additional efforts must include the training of construction staff (e.g. in Toolbox talks) to identify Red Data species, followed by regular questioning of staff as to the regular whereabouts on site of these species; and* • *If any avifaunal SCCs are confirmed to be breeding (e.g. if a nest site is found), construction activities within 500 m of the breeding site must cease, and an avifaunal specialist is to be contacted immediately for further assessment of the situation*	

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				and instruction on how to proceed.	
DIRECT MORTALITY	Fatalities of avifaunal species can occur through collision with vehicles as traffic in the area increases due to construction activity. Large-bodied and ground dwelling species (e.g. korhaans, cranes and bustards) are at increased risk, but this impact can be effectively mitigated against. Temporary fencing can result in collisions, entrapment or entanglement if not suitably installed. Similarly ground dwelling avifauna (particularly chicks) can fall into uncovered excavations and become entrapped.	**DIRECT**	**LOW -**	• *Maximum use of existing access road and servitudes;* • *No off-road driving in undesignated areas;* • *Speed limits (50 km/h) must be strictly enforced on site to reduce probability of vehicle collisions;* • *The movement of construction personnel must be restricted to the construction areas on the project site;* • *NO dogs or cats other than those of the landowners must be allowed on site;* • *Any holes dug e.g. for foundations of pylons must not be left open for extended periods of time to prevent entrapment by ground dwelling avifauna or their young and only be dug when required and filled in soon thereafter;* • *Temporary fencing must be suitably constructed, e.g. if double layers of fencing are required for security purposes, they must be positioned at*	**LOW -**

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				least 2 m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences; and • *Roadkill must be reported to the ECO and removed as soon as possible to reduce attracting crows to the area.*	
CUMULATIVE IMPACT ON AVIFAUNAL HABITAT, DISPLACEMENT AND DIRECT MORTALITY	At least 6 onshore wind facilities and onshore wind/solar PV combined facilities are being considered according to the DFFE Renewable Energy database (Q3 2022) within 50 km of the proposed development site, mostly towards the town of De Aar the north-east. In addition to these, the Britstown WEF Complex comprises 5 WEFs on the neighbouring properties.	**INDIRECT, CUMUALTIVE**	**HIGH -**	• *All appropriate mitigation measures listed above should be implemented;* • *Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management.*	**MODERATE -**
BAT IMPACT ASSESSMENT					
HABITAT MODIFICATION	Bats can be impacted indirectly through the modification or removal of habitats, and can also be displaced from foraging habitat by the construction of wind turbines and associated infrastructures. The removal of	**INDIRECT** **NO-GO**	**MODERATE -** **NO IMPACT**	• *The removal of vegetation and man-made buildings should be avoided in all high sensitive areas, as far as possible, and reduced across the project site in all other areas.*	**LOW -** **N/A**

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	vegetation during the construction phase can impact bats by removing vegetation cover and linear features that some bats use for foraging and commuting. This modification could subsequently also create favourable conditions for insects upon which bats feed which would in turn attract bats to the proposed WEF area.				
DISTURBANCE / DISPLACEMENT	WEF's have the potential to impact bats indirectly during the construction phase through the disturbance of roosts or when conducting activities during hours of important bat foraging activities. Relevant activities include the construction of roads, O&M buildings, sub-station(s), internal transmission lines and the installation of wind turbines. Excessive noise and dust during the construction phase could result in bats abandoning their roosts, depending on the proximity of construction activities to roosts.	**INDIRECT** **NO-GO**	**MODERATE -** **NO IMPACT**	▲ *Limit construction activities to daylight hours only.* ▲ *Avoid all construction activities within potential roosting habitats, if identified at the time when construction activities (for wind turbines and associated infrastructures) take place. No confirmed roosts have been identified on site to date, although it is recommended for a final specialist site walk-through to take place prior to construction to confirm this.*	**LOW -** **N/A**
ECOLOGICAL IMPACT ASSESSMENT					
LOSS OF FAUNAL HABITAT	The clearing of habitat for the project infrastructure will result in the loss of faunal habitat.	**DIRECT**	**MODERATE -**	▲ *The development must consolidate road networks to minimise the loss of faunal habitat.*	**MODERATE -**

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	Vegetation such as trees and shrubs will be removed and earthworks and heavy machinery will impact microhabitats such as burrows, fallen trees and rocks that will be removed or relocated. The faunal species that may utilise the habitat within the project footprint will no longer have access to these habitats for the life of the project and are considered negatively impacted by the project. However, ample suitable faunal habitat is present within the project area for these species.			• *All construction and construction related activities (including parking of vehicles and machinery) must remain within the approved project footprint.* • *Microhabitats (e.g. rock stacks and logs) in the clearing footprint must be relocated to the same habitat immediately adjacent to the removal site. E.g. Rock stacks should be restacked.* • *Temporary infrastructure (laydown areas, widened roads, etc.) must be rehabilitated and efforts must provide habitat for faunal species by placing logs and rocks at strategic sites to provide shelter for small mammals and reptiles.*	
	NO IMPACT	**NO-GO**	**NO IMPACT**		**NO IMPACT**
LOSS OF FAUNAL SPECIES OF CONSERVATION CONCERN	The grassland associated with the Black-footed Cat (VU) habitat was found to be of medium sensitivity but the shrubland (rocky outcrops and slopes) associated with the Southern Mountain Reedbuck and Dwarf Karoo Tortoise (EN) was determined to have a High SEI.	**DIRECT**	**HIGH -**	• *A clause must be included in contracts for ALL personnel (i.e. including contractors) working on site stating that: "no wild animals will be hunted, killed, poisoned or captured. No wild animals will be imported into, exported from or transported in or through the province. No wild animals will be sold, bought, donated and no person associated with the development will be in possession of any live wild animal, carcass or anything manufactured from the carcass."*	**MODERATE -**
	NO IMPACT	**NO-GO**	**NO IMPACT**		**NO IMPACT**

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				• *In addition, a clause relating to fines, possible dismissal and legal prosecution must be included should any of the above transgressions occur, especially for SCC.* • *A search and rescue should be conducted for the Dwarf Karoo Tortoise and if found must be relocated to suitable habitat immediately adjected to where it was found.*	
DISTURBANCE TO FAUNAL SPECIES AND THEIR LIVELIHOOD DUE TO CONSTRUCTION RELATED ACTIVITIES	Construction activities (earthworks, blasting, night lighting) create noise, dust and vibrations that fauna experience for the duration of the construction phase. It is unlikely that animals in the area are habituated to these activities and their livelihood activities are likely to be disturbed to some extent. The construction activities may cause individuals to move away from the immediate area into surrounding areas, increasing competition for food and shelter in those areas, and may even disrupt their current breeding cycle causing them to skip a season.	**DIRECT**	**MODERATE -**	• *Dust suppression measures must be implemented in the dry and/or windy months.* • *All machinery, vehicles and earth moving equipment must be maintained and the noise these create must meet industry minimum standards. e.g. the sound generated by a machine must be below a certain decibel as prescribed in the relevant noise control regulations.* • *A Storm Water Management Plan must be drafted and implemented to prevent runoff entering aquatic systems and causing siltation and pollution of this faunal habitat. Hard surfaces should be avoided.* • *No construction night lighting must be allowed. If required, Minimise lighting in open space areas within development and any external lights*	**LOW -**
	NO IMPACT	**NO-GO**	**NO IMPACT**		**NO IMPACT**

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				must be down lights placed as low as possible and installation of low UV emitting lights, such as most LEDs. • *Steep sided drains, gutters, canals and open pits/trenches must be covered with mesh (5mm x 5mm) or sloped to prevent fauna falling in and getting stuck. No unnecessary structures that would act as pitfall traps for animals must be constructed.*	
MORTALITY OF FAUNAL SPECIES DUE TO EARTHWORKS, ROADKILL AND PERSECUTION	Removal of faunal habitat and land levelling machinery may cause mortalities of faunal species sheltering or taking refuge within the habitat, such as reptiles, amphibians and small rodents that shelter in rocky crevices. Contractor vehicles may cause faunal mortalities due to collision. In addition, species perceived as a threat are known to be persecuted e.g. snakes.	**DIRECT**	**MODERATE-**	• *Speed restrictions within the residential development for all vehicles (30km/h is recommended) should be in place to reduce the impact of killed fauna on the project roads.* • *Any faunal species that may die as a result of construction must be recorded (i.e. be photographed, GPS co-ordinates taken) and if somewhat intact preserved and donated to the nearest university, museum or SANBI.*	**MODERATE -**
	NO IMPACT	**NO-GO**	**NO IMPACT**	• *A trained snake handler must be on call during construction to remove any snakes within construction areas.* • *A clause relating to fines, possible dismissal and legal prosecution must be included in all contracts for ALL personnel (i.e. including contractors)*	**NO IMPACT**

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				working on site should any speeding or persecution of animals occur.	
INCREASED REDUCTION IN FAUNAL HABITAT AND INCREASE DISTURBANCE OF FAUNAL SPECIES	The cumulative impact associated with all six WEF will result in the combined loss of faunal habitat across all six sites and faunal species that will move due to the disturbance may have to move further as adjacent habitat will be impacted on as well.	**CUMULATIVE**	**HIGH -**	*Refer to mitigation measures above.*	**MODERATE -**
INCREASED FAUNAL MORTALITY	Removal of faunal habitat and land levelling machinery may cause mortalities of faunal species sheltering or taking refuge within the habitat, such as reptiles, amphibians and small rodents that shelter in rocky crevices. Contractor vehicles may cause faunal mortalities due to collision. In addition, species perceived as a threat are known to be persecuted e.g. snakes.	**CUMULATIVE**	**HIGH -**		**MODERATE-**
LOSS OF EASTERN UPPER KAROO	The clearing of vegetation for the construction of the WEF and associated infrastructure will result in the permanent loss of approximately 179ha of Eastern Upper Karoo. The extent of vegetation that will be impacted equates to 0.004% of the	**DIRECT**	**MODERATE -**	*For Direct Impacts:* • *Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.* • *Topsoil (20 cm, where possible) must be collected and stored in an area of low (preferable) and medium*	**MODERATE -**

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	remaining extent of this vegetation unit. The loss of this vegetation type, which is listed as Least Concern, will have an overall impact of moderate significance. This impact is difficult to mitigate as the loss of vegetation is definite and permanent and as such the impact will remain of moderate significance even after mitigation measures have been implemented.			*sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).* • *Only indigenous species must be used for rehabilitation.* • *Where possible, lay down areas must be located within previously disturbed sites.* • *Employees must be prohibited from making open fires during the construction phase.* • *Employees must be prohibited from collecting plants. It is recommended that spot checks of pockets and bags are done on a regular basis to ensure that no unlawful harvesting of plant species is occurring.* • *An alien invasive management plan for the site must be created.* • *An in-situ search and rescue plan must be developed and implemented for succulents and geophytes that will be impacted by the construction of the project site.* • *Plant translocation to adjacent suitable habitat may only be done for species that are not range restricted and for populations that have not been quantified as regionally significant.* • *In such cases that this is not feasible,*	
	The cumulative impact associated with all 6 WEFs will result in the combined loss of 1002 ha of Eastern Upper Karoo which is 0.2% of the remaining extent of this vegetation type. This is compounded by an additional 15 known WEFs in the 100 km radius of the proposed project. It has been assumed that these 15 known WEF will each result in an estimated loss of 0.1% of this vegetation type per WEF. Combined with the 6 Soyuz WEF this equates to approximately 1.7%. Rounded up this is 2% of the vegetation that could be lost. Given how	**CUMULATIVE AND DIRECT**	**MODERATE**		**MODERATE -**

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	widespread, this vegetation type is and that a large portion still remains intact, the loss of 2% of this vegetation is still within the limit of acceptable change			*any requirement for translocation must be discussed with the relative authorities prior to translocation taking place.*	
	No-Go Impact: If the project does not proceed, the property would continue to be grazed by small livestock resulting in the continued degradation of the site. The impact associated with the no-go alternative would be low.	***NO-GO***	**LOW -**		**N/A**
LOSS OF UPPER KAROO HARDEVELD	The clearing of vegetation for the construction of the WEF and associated infrastructure will result in the permanent loss of approximately 15 ha of Upper Karoo Hardeveld. The extent of vegetation that will be impacted equates to 0.0012% of the remaining extent of this vegetation unit. The loss of this vegetation type, which is listed as Least Concern, will have an overall impact of moderate significance. This impact is difficult to mitigate as the loss of vegetation is definite and permanent and as such the impact will remain of moderate	**DIRECT**	**MODERATE -**	*For Direct Impacts, all mitigation measures listed above under LOSS OF EASTERN UPPER KAROO must be implemented.*	**MODERATE-**

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	significance even after mitigation measures have been implemented.				
	No-Go impact: If the project does not proceed, the property would continue to be grazed by small livestock, such as sheep, resulting in the continued degradation of the site. The no-go alternative would be low.	***NO-GO***	**LOW**		**N/A**
	The cumulative impact associated with all 6 WEFs will result in the combined loss of 4035 ha of Upper Karoo Hardeveld which is 0.34% of the remaining extent of this vegetation type. This is compounded by an additional 15 known WEFs in the 100 km radius of the proposed project. . It has been assumed that these 15 known WEF will each result in an estimated loss of 0.1% of this vegetation type per WEF. Combined with the 6 Soyuz WEF this equates to approximately 1.84%. Rounded up this is 2% of the vegetation that could be lost. Given how widespread, this vegetation type is and that a	**CUMULATIVE AND DIRECT**	**MODERATE -**		**MODERATE -**

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	large portion still remains intact, the loss of 2% of this vegetation is still within the limit of acceptable change				
LOSS OF SPECIES OF CONSERVATION CONCERN	No restricted range species or CR, EN or VU species were recorded within the site during the field survey. However, two SCC were identified during the desktop assessment. One species, Tridentia virescens, has a high likelihood of occurrence within the washes and the second species, Hereroa concava, has a moderate likelihood of occurrence. If the species are present within the infrastructure footprint, the impact will be of high significance. However, if the recommended mitigation measures are implemented, the impact can be reduced to moderate significance. Cumulative Impact: The cumulative impact associated with all known WEF in the area will increase the probability that SCC will be impacted. No-Go Impact: If the project	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH -** **HIGH -** **NEGLIGIBLE**	*For Direct Impacts, all mitigation measures listed above under LOSS OF EASTERN UPPER KAROO must be implemented.in addition to the following:* • *An ecological walk-through must be undertaken prior to construction and where Threatened (i.e. Critically Endangered, Endangered and Vulnerable) species are recorded, project infrastructure must be moved to avoid these populations. If this is not feasible, then a translocation plan for the population must be designed and implemented with input from an experienced horticulturalist with knowledge on how to move these species to ensure the best chance of survival.*	**MODERATE -** **MODERATE -** *N/A*

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	does not proceed, the property would continue to be grazed by small livestock. Impacts on SCC are likely to be negligible				
DISRUPTION OF ECOSYSTEM FUNCTION AND PROCESS	Fragmentation is one of the most important impacts on vegetation as it creates breaks in previously continuous vegetation, causing a reduction in the gene pool and a decrease in species richness and diversity. This impact occurs when more and more areas are cleared, resulting in the isolation of functional ecosystems, which results in reduced biodiversity and reduced movement due to the absence of ecological corridors. The infrastructure associated with the WEF, particularly the roads, will increase habitat fragmentation by creating breaks in the environment. However, the movement of species (fauna and seeds) will not be entirely prohibited due to the nature of the infrastructure and the ecological functioning of the site can still be maintained.	**DIRECT**	**MODERATE -**	*For Direct Impacts, all mitigation measures listed above under LOSS OF EASTERN UPPER KAROO must be implemented.in addition to the following:* • *Rehabilitate laydown areas* • *Use existing access roads and upgrade these where necessary*	**LOW -**
	No-Go Impact: If the project	***NO-GO***	**LOW -**		**N/A**

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	does not go ahead, the vegetation would remain intact and there will be limited impacts to ecosystem function and process. The impact associated with this will be of low significance.				
	The cumulative impact associated with all known WEFs in the area will increase habitat fragmentation which could impact on ecosystem functioning at a larger scale.	**CUMULATIVE**	**HIGH -**		**MODERATE -**
HERITAGE IMPACT ASSESSMENT					
LOSS OF HERITAGE RESOURCE FOR S1WEF01, S1WEF02, S1WEF03	Construction activities pose the greatest threat to tangible heritage resources within the cultural landscape and it is often during this Phase that heritage sites are lost. An array of archaeological areas occurs across the project landscape, many of which have been excluded from infrastructure development zones at Scoping Level. Still, Stone Age localities of low significance and not conservation-worthy occur in project footprints even though the resources may be destroyed during construction, the impact is inconsequential. Previously	**DIRECT**	**LOW -**	*No further action / Monitoring* *Where no heritage resources have been documented, heritage resources occur well outside the impact zone of any development or the primary context of the surroundings at a development footprint has been largely destroyed or altered, no further immediate action is required. Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage\ remains are destroyed.* *Site Monitoring:* *General Site Monitoring in order to detect the presence of and limit impact on*	**LOW -**

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	undetected cultural (archaeological) layers are usually superficial, subsoil layers and that makes them easily vulnerable to destruction and the likelihood for encountering additional cultural heritage sites as the land clearing process commences, or during construction of infrastructure should be considered. It should be noted that graves and cemeteries do not only occur around farmsteads in family burial grounds but they are also randomly scattered around archaeological and historical settlements in the rural areas of the Northern Cape Province. The probability of informal human burials encountered during the construction phase should thus not be excluded. Monitoring activities will be required throughout the construction phase of the Project in order to avoid the destruction of previously undetected heritage sites and human burials. Site monitoring of the Historical Period veewagtershuis site (**S1WEF02**) will be required			*previously undocumented heritage receptors during construction / site clearing / earth moving* *Avoidance* *This is appropriate where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. Mitigation is not acceptable or not possible. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.* *Mitigation* *This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated to a degree of medium to low significance, e.g. the high to medium impact of a development on an archaeological site could be mitigated through sampling/excavation of the remains. Not all negative impacts can be mitigated.* *Compensation* *Compensation is generally not an appropriate heritage management action. The main function of management actions should be to conserve the resource for the benefit of*	

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	throughout the construction phase of the Project in order to avoid the destruction of previously undetected heritage sites and human burials.			*future generations. Once lost it cannot be renewed. The circumstances around the potential public or heritage benefits would need to be exceptional to warrant this type of action, especially in the case of where the impact was high.* *Rehabilitation* *Rehabilitation is considered in heritage management terms as an intervention typically involving the adding of a new heritage layer to enable a new sustainable use. It is not appropriate when the process necessitates the removal of previous historical layers, i.e. restoration of a building or place to the previous state/period. It is an appropriate heritage management action in the following cases:* *- The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation.* *- Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric.* *- Where the rehabilitation process will not result in a negative impact on the intrinsic value of the resource.*	
LOSS OF HERITAGE RESOURCE FOR S1WEF04 - S1WEF14	Construction activities pose the greatest threat to tangible heritage resources within the cultural landscape and it is often during this Phase that heritage sites are lost. An array of archaeological areas occurs across the project landscape, many of which have been excluded from infrastructure development zones at Scoping Level. Still, Stone Age localities of low significance and not conservation-worthy occur in project footprints even though the resources may be destroyed during construction, the impact is inconsequential. Previously undetected cultural (archaeological) layers are usually superficial, subsoil layers and that makes them easily vulnerable to destruction and the likelihood for encountering additional cultural heritage sites as the land clearing process commences, or during	**DIRECT**	**LOW + /-**		**LOW +/ -**

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	construction of infrastructure should be considered. It should be noted that graves and cemeteries do not only occur around farmsteads in family burial grounds but they are also randomly scattered around archaeological and historical settlements in the rural areas of the Northern Cape Province. The probability of informal human burials encountered during the construction phase should thus not be excluded. Monitoring activities will be required throughout the construction phase of the Project in order to avoid the destruction of previously undetected heritage sites and human burials. Site monitoring of the Historical Period veewagtershuis site (**S1WEF02**) will be required throughout the construction phase of the Project in order to avoid the destruction of previously undetected heritage sites and human burials.				
CUMULATIVE IMPACTS	It is the opinion of the Specialist that the proposed Soyuz 1 Wind Energy Facility and its associated power line connection will have	**CUMULATIVE**	**LOW -**		**LOW -**

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	a low negative cumulative impact on the heritage value of the area for the following reasons: - The low frequency of significant archaeological resources documented in the project area and in its immediate surroundings implies low-severity short and long-term impacts on the heritage landscape. In addition, localised and spatially confined heritage resources can easily be avoided by project design of individual turbines, pylon placements and service roads. - The significance of the landscape in terms of its heritage is bound not to change during the course of construction, operation and decommissioning of the project. - The proposed Soyuz 1				

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	WEF is situated in region which has seen the rapid development of vast and large-scale renewable energy facilities such as the Maanhaarberg WEF, the Great Karoo Renewable Energy Facility, the Modderfontein WEF and many Solar PV Developments around the town of De Aar. The developments cumulatively add to a transformed landscape and sense of place where the character of this portion of the Karoo is evolving into a centre for renewable power generation. - It should be noted that archaeological knowledge and the initiation of research projects into significant archaeological sites often result from Heritage Impact Assessments				

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	conducted for developments. Provided that significant archaeological sites are conserved and that appropriate heritage mitigation and management procedures are followed, the cumulative impact of development can be positive.				
NOISE IMPACT ASSESSMENT					
CONSTRUCTION OF ACCESS ROADS	Daytime ambient sound levels could range from less than 20 dBA to more than 89 dBA, averaging at 33.9 dBA. Daytime ambient sound levels are thus low and typical of a rural noise district. It is expected that introduced noises will be audible over large distances during quiet periods (during low wind conditions). Road construction activities will increase ambient sound levels due to air-borne noise. The projected noise levels, the	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**	• *While projected noise levels may be very high, it relates to the low ambient sound levels measured during the day as well as strict assessment criteria. The significance of the noise impact remains low for access road construction activities and no additional mitigation is required or recommended.* • *There is no risk of any residual noise.*	**LOW -** **LOW -** **NO IMPACT**

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	change in ambient sound levels as well as the potential noise impact is defined per NSR in Appendix F, Table 2(pre-mitigation) of the Specialist Noise Report.				
DAYTIME WTG CONSTRUCTION ACTIVITIES	Daytime ambient sound levels could range from less than 20 dBA to more than 89 dBA, averaging at 33.9 dBA. Daytime ambient sound levels are thus low and typical of a rural noise district. It is expected that introduced noises will be audible over large distances during quiet periods (during low wind conditions). Various construction activities (development of laydown areas and the hard standing areas, excavation of foundations, concreting of foundations and the assembly of the wind turbines tower and components, as well as construction of other infrastructure) taking place simultaneously during the day will increase ambient sound levels due to air-borne noise.	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**	*While projected noise levels may be very high, it relates to the low ambient sound levels measured during the day as well as strict assessment criteria. The significance of the noise impact is low for daytime construction activities and no additional mitigation is required or recommended.* *There is no risk of any residual noises.*	**LOW -** **LOW -** **NO IMPACT**

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	The projected noise levels, the change in ambient sound levels as well as the potential noise impact is defined per NSR in Appendix F, Table 4(pre-mitigation) of the Specialist Noise Report.				
NIGHT-TIME WTG ACTIVITIES	Night-time ambient sound levels could range from less than 20 dBA to more than 51 dBA, averaging at 23 dBA. Night-time ambient sound levels are very low during period of low winds and it is expected that introduced noises will be audible over significant distances during quiet periods (during low and no wind conditions). Various construction activities (likely limited to the pouring of concrete as well as erection of WTG components) taking place simultaneously at night will increase ambient sound levels due to air-borne noise, using the criteria of the author. The projected noise levels, the change in ambient sound levels as well as the potential noise impact is defined per NSR in	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH** **HIGH** **NO IMPACT**	It is therefore recommended that the applicant consider: • Agreement between the applicant and the landowner that the structures near NSR07 will not be used for residential purposes if the project proceed; or • The applicant designs and implements a noise abatement programme to ensure that the projected noise levels are less than 45 dBA at NSR07 (during periods that the structures are used for residential purposes). This could include using WTG (within 2,000m from NSR07) that has different sound reductionmodes (such as WTG with a noise emission level less than 106.5 dBA re pW); **or** • The applicant can change the layout, removing WTG B6-57 (or relocating it further than 2,000m from this NSR), at the same time moving other WTG	**LOW -** **LOW -** **NO IMPACT**

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	Appendix F, Table 5(pre-mitigation) of the Specialist Noise Report.			(WTG B6-56, B6-59 and B6-60) further than 1,000m from NSR07; **or**
				• The applicant can use a WTG can reduce SPL to less than 106.5 dBA (re 1 pW) - within 2,000m from NSR07; or
				• The applicant can change the layout, removing WTG B6-57 (or relocating it further than 2,000m from this NSR), at the same time moving WTG further than 1,000m from NSR07; or
				• The applicant can:
				  • change the layout, removing WTG B6-57 (or relocating it further than 2,000m from this NSR); **and**
				  • select a WTG with a SPL less than 108.5 dBA (re 1 pW) within 2,000m from NSR07.	

CONSTRUCTION TRAFFIC NOISES	Daytime ambient sound levels could range from less than 20 dBA to more than 89 dBA, averaging at 33.9 dBA. Daytime ambient sound levels are thus low and typical of a rural noise district. It is expected that introduced noises will be audible over large distances during quiet periods (during low wind conditions).	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **LOW -** **NO IMPACT**	*The significance of noises due to construction traffic is low no additional mitigation is required or recommended.* *There is no risk of any residual noise.*	**LOW -** **LOW -** **NO IMPACT**

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	Construction traffic will increase ambient sound levels due to air-borne noise. The projected noise levels, the change in ambient sound levels as well as the potential noise impact is defined per NSR in Appendix F, Table 3(pre-mitigation) of the Specialist Noise Report.				
PALAEONTOLOGICAL IMPACT ASSESSMENT					
LOSS OF FOSSIL HERITAGE	The project is mostly underlain by Late Caenozoic alluvium, a small portion of Tertiary-Quaternary Calcrete as well as Jurassic Karoo dolerite and the Tierberg Formation (Ecca Group) of the Karoo Supergroup. This part of the basin is extensively intruded by dolerite dykes and sills baking the surrounding Ecca Group sediments, thus compromising the fossil heritage of the area through thermal metamorphism. According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Late Caenozoic superficial deposits is Moderate, that of Tertiary-Quaternary	**DIRECT** **CUMULATIVE**	**MEDIUM -** **HIGH -**	• *The ECO for this project must be informed that the Ecca Group of the Karoo Supergroup has a High Palaeontological Sensitivity.* • *If any fossil remains or trace fossils are discovered during any phase of construction or operation, either on the surface or exposed by excavations, the ECO in charge of this development should implement the Chance find Protocol immediately. These discoveries should be protected (if possible, in situ) and the ECO must report such discoveries to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). Suitable mitigation (e.g., recording and*	**LOW** **LOW -**

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	Calcrete is High while that of the Jurassic dolerite is Zero. The Palaeontological Sensitivity of the Tierberg Formation (Ecca Group) is High (Almond et al, 2013; SAHRIS website). Extensive research and fossil collecting have been conducted by palaeontologists in the last few decades, however, the Britstown area have been largely neglected. A 6-day overall comprehensive site-specific field survey of the Soyuz WEF Cluster was conducted on foot and by motor vehicle in October 2022. In the area investigated no fossiliferous outcrops were recovered. This could be attributed to the dolerite intrusions that metamorphized potentially fossiliferous Beaufort sediments, low relief of the development as well as poor bedrock exposure and relative unfossiliferous superficial sediments. However, it must be emphasised that the presence of well-preserved fossils is not ruled out.			*collection) will consequently be undertaken by a palaeontologist.* • *Before any fossil material can be collected from the development site, the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012).* • *These recommendations should be incorporated into the Environmental Management Plan for the Soyuz 1 WEF.*	

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	A Medium Palaeontological Significance has been allocated for the construction phase of the WEF development pre-mitigation and a low significance post mitigation. The construction phase will be the only development phase impacting Palaeontological Heritage and no significant impacts are expected to impact the Operational and Decommissioning phases. As the No-Go Alternative considers the option of 'do nothing' and maintaining the status quo, it will have a Neutral impact on the Palaeontological Heritage of the development. The Cumulative impacts of the Soyuz 1 WEF development near Britstown is considered to be high pre- mitigation and Low post mitigation and falls within the acceptable limits for the project. It is therefore considered that the proposed development will not lead to destructive impacts on the palaeontology of the area. The construction of the				

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	development may thus be authorized in its whole extent, as the development footprint is not considered sensitive from a palaeontological point of view. It is thus recommended that no further palaeontological heritage studies, ground truthing or specialist mitigation are required pending the discovery of new fossil assemblages.				
SOCIAL IMPACT ASSESSMENT					
POSITIVE ATTITUDE TOWARDS THE DEVELOPMENT	Overall feelings in the town were overwhelmingly positive, and in the surrounding farms feelings were generally positive towards the WEF.	**DIRECT**	**MODERATE +**	• *Good communication about the project needs to be practiced throughout as both locals and businesses need time to plan accordingly for any changes that will occur in the area.* • *Ensure that notice is given and landowners and locals are properly informed throughout the project.*	**MODERATE +**
HIGH COMMUNITY EXPECTATIONS FOR BENEFITS RESULTING FROM THE PROJECT	Expectations are high among members of the local community in terms of what the development will offer and contribute, especially where it may improve their livelihoods.	**DIRECT**	**MODERATE +**	• *Good communication about the project needs to be practiced throughout as both locals and businesses need time to plan accordingly for any changes that will occur in the area.* • *Ensure that notice is given and landowners and locals are properly informed throughout the project.*	**MODERATE +**

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				• *A positive relationship must be established and maintained with affected landowners. There should always be an open line of communication and grievances must be addressed satisfactorily and promptly.* • *Affected landowners must be consulted and respected in terms of access to the site, security and all activities on the site, in order to minimise negative impacts to landowners. Disruptions to directly affected and adjacent landowners must be kept to a minimum.* • *Complaints and concerns must be addressed promptly, and feedback must be given to complainants.*	
JOB CREATION: CONSTRUCTION	A number of employment opportunities will be created during the construction phase.	**DIRECT, INDIRECT AND CUMULATIVE**	**HIGH +**	• *Employment opportunities and criteria should be communicated to the community before being advertised outside the municipal area.* • *Hiring should focus on the nearest and surrounding community. If not, jealousy and disdain or resentment for the project may develop.* • *Unreasonable expectations with regards to employment opportunities should not be created, and the developers should be transparent about the limited*	**HIGH +**

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				number of employment opportunities that will be created.	
SMME DEVELOPMENT	As part of the WEF's LED programme, development of SMMEs may be supported.	**DIRECT, INDIRECT AND CUMULATIVE**	**HIGH +**	• *Ensure local SMME's are utilised throughout the project, as far as possible.* • *The creation of secondary opportunities for income generation, such as supplying meals to employees, should be investigated and implemented if possible.* • *External contractors and suppliers from within the local municipality must be given preference.* • *Source materials and products locally, as far as possible.*	**HIGH +**
SUPPORT OF LOCAL/REGIONAL BUSINESSES: CONSTRUCTION	Personnel that come to the area during the construction phase will likely support local businesses, such as hospitality facilities, food outlets, etc. Local or regional businesses may also be able to supply some of the construction materials.	**DIRECT, INDIRECT AND CUMULATIVE**	**MODERATE +**	•	**MODERATE +**
POSSIBILITY FOR TRAINING AND UPSKILLING OF LOCAL COMMUNITY DURING CONSTRUCTION, OPERATION AND THROUGH LED PROJECTS	There may be an opportunity to provide training and develop skills during both construction and operation phases. It is anticipated that there may also be such opportunities arising from the WEF's LED programme subsequent to commencement of operation.	**DIRECT**	**MODERATE +**	• *It is recommended that these be maximised whenever possible, and that the local community, especially, be the beneficiaries of this.*	**MODERATE +**

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IN-MIGRATION OF JOB SEEKERS	A large-scale in-migration of people in search of work is often a concern associated with new developments. However, this usually applies to larger developments, and is not expected to happen in a large scale in the instance of the WEF.	**DIRECT**	**LOW -**	*No mitigation possible.*	**LOW -**
INCREASE IN TRAFFIC DURING CONSTRUCTION	There will likely be an increase in traffic, especially construction vehicles, during the construction phase. However, this will be temporarily, and the Traffic Department did not express a concern in that regard, as the N12 is already used, and therefore able to accommodate, heavy duty traffic including trucks.	**DIRECT**	**MODERATE -**	*Steps must be taken to minimise road accidents, including the use of clear signage, reducing speed limits and visible policing.*	**LOW -**
NOISE FROM CONSTRUCTION ACTIVITIES	Construction activities will create some noise disturbance, but since the development will be located outside town boundaries, it will likely not have much impact on residents of Britstown.	**DIRECT**	**LOW -**	*Measures should be taken to reduce noise. Noise generating activities should be limited to regular business hours.*	**LOW -**
THERE MAY BE SENSITIVE HERITAGE FEATURES ON THE SITE THAT MAY BE IMPACTED	There may be sensitive heritage features on the site that may be impacted.	**DIRECT**	**MODERATE -**	*Recommendations and mitigation measures contained in the Heritage Impact Assessment must be adhered to.*	**MODERATE -**
POSSIBLE REDUCTION IN CRIME RATES	The presence of the project could possibly reduce the rate of	**DIRECT, INDIRECT, CUMULATIVE**	**LOW +**	*Measures should be taken to ensure security around any construction*	**LOW +**

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	petty theft and stock theft in the area. People may also resort less to crime if they obtain legitimate incomes through employment or business opportunities.			*site, including maintaining access control onto affected farms.* • *Affected landowners must be consulted and respected in terms of access to the site, security and all activities on the site, in order to minimise negative impacts to landowners.*	
LOSS OF AGRICULTURAL LAND	A small amount of agricultural land (used for grazing currently) will be lost to the wind turbines and access roads, but this will not be significant.	**DIRECT**	**LOW -**	• *N/A*	**LOW -**
NEGATIVE VISUAL IMPACT ANDLOSS OF SENSE OF PLACE	WEFs invariably have a visual impact on an area. Many people perceive this as negative, and as spoiling the sense of place.	**DIRECT**	**MODERATE -**	• *Mitigation measures suggested by the visual impact specialist must be adhered to.*	**MODERATE -**
LOSS OF INCOME DUE TO VISUAL IMPACTS	The presence of the WEF may negatively impact a hunting establishment in that international clientele seek the specific aesthetic of the desolate landscape, which will change as a result of the WEF.	**DIRECT, INDIRECT AND CUMULATIVE**	**LOW -**	• *N/A*	**LOW -**
TRAFFIC IMPACT ASSESSMENT					
NOISE AND POLLUTION	During the construction phase, some dust and noise pollution will be generated through heave vehicles travelling toward and from the site.	**DIRECT**	**MODERATE -**	• *Stagger turbine component delivery to site* • *Keep the construction period to a minimum* • *Stagger the construction of the turbines* • *The use of mobile batch plants and*	**LOW -**
TRAFFIC IMPACTS	Trips will increase during the construction period, which is of	**DIRECT**	**MODERATE -**		**LOW -**

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	temporary nature (for the duration of the construction period).			*quarries in close proximity to the site would decrease the impact on the surrounding road network.* • *Staff and general trips should occur outside of peak traffic periods as far as possible.* • *Maintenance of haulage routes.* • *Design and maintenance of internal roads.* • *Schedule abnormal loads to outside peak traffic periods.*	
CUMULATIVE IMPACT: TRAFFIC IMPACTS AND ASSOCIATED NOISE AND DUST POLLUTION	The cumulative impact assumes that all approved developments will be constructed at the same time, which would increase noise, pollution and traffic on surrounding roads for the construction period.	**CUMULATIVE**	**HIGH -**	• *Only some of these developments will be successful at the respective bidding round and then constructed in agreement with the road authorities.* • *Scheduling of heavy and abnormal vehicles for the developments need to be planned and agreed upon between developers of any projects located within a 50km radius.* • *Stagger turbine component delivery to site* • *Keep the construction period to a minimum* • *Stagger the construction of the turbines* • *The use of mobile batch plants and quarries in close proximity to the site would decrease the impact on the surrounding road network.* • *Staff and general trips should occur*	**MODERATE -**

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				outside of peak traffic periods as far as possible. • *Maintenance of haulage routes.* • *Design and maintenance of internal roads.* • *Schedule abnormal loads to outside peak traffic periods.*	
VISUAL IMPACT ASSESSMENT					
POTENTIAL VISUAL IMPACT OF CONSTRUCTION ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE FACILITY	During the construction period, there will be an increase in heavy vehicles utilising the roads to the construction sites that may cause, at the very least, a visual nuisance to other road users and landowners in the area in close proximity (within 5km). Within the region, dust as a result of construction activities may also be visible, as such it will result in a visual impact occurring during construction. Sensitive receptors in this zone consist of observers travelling along the N12, various secondary and internal farm roads, as well as residents of various homesteads (refer to Section 6.6 of specialist report for a full list).	**DIRECT**	**HIGH -**	***Mitigation / Management:*** *Construction:* • *Ensure that vegetation is not unnecessarily removed during the construction period.* • *Reduce the construction period through careful logistical planning and productive implementation of resources.* • *Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible.* • *Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.* • *Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.* • *Reduce and control construction dust*	**MODERATE -**
		CUMULATIVE	*No cumulative impacts as a result of the construction activities are expected.*		**N/A**
		NO-GO	***NO IMPACT***		**NO IMPACT**

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				using approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent). • *Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts.* • *Rehabilitate all disturbed areas immediately after the completion of construction works.*	
OPERATIONAL PHASE					
AGRICULTURAL IMPACT ASSESSMENT					
SOIL EROISON	The areas where vegetation was cleared, will remain at risk of soil erosion, especially during a rainfall event when runoff from the cleared surfaces will increase the risk of soil erosion in the areas directly surrounding the wind turbines and buildings.	**DIRECT**	***MODERATE -***	• *The project site must regularly be monitored to detect early signs of soil erosion on-set.* • *If soil erosion is detected, the area must be stabilised by the use of geo-textiles and facilitated re-vegetation.*	**LOW -**
SOIL POLLUTION	During the operation phase of the project, the following activities can result in the chemical pollution of the soil: 1. Petroleum hydrocarbon (present in oil and diesel) spills by maintenance machinery and vehicles. 2. The generation of domestic waste by maintenance staff.	**DURECT**	***LOW -***	• *Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills;* • *Any waste generated during construction, must be stored in designated containers and removed from the site by the construction teams; and* • *Any left-over construction materials must be removed from site.*	**LOW -**

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AQUATIC IMPACT ASSESSMENT					
ALTERATION OF HYDROLOGICAL AND GEOMORPHOLOGICAL PROCESSES	Localised alteration of hydrological and geomorphological processes around the turbines within the watercourses A02 and A07, resulting in increased localised run-off, erosion and sedimentation.	**INDIRECT, CUMULATIVE**	***LOW -***	***Minimize/reduce:*** • *Stormwater infrastructure must be maintained and monitored for effectiveness with respect to controlling and minimising erosion and sedimentation of watercourses.* • *Given that water flows in the washes generally occur across a very wide front and are usually as very infrequent and very brief events, it is recommended that "drift-type" road crossings be used where appropriate and designed for flow over the road surface rather than directing it under the road with culverts. Where access road crossings of defined channels is required, box culverts must be stablished across the width of the watercourse.* ***Remediate/rehabilitate:*** • *The site must be monitored for erosion and should be rehabilitated where applicable.*	**LOW -**
	Alteration of hydrological and geomorphological processes within high EIS watercourses (A02 and A07) at and downstream of the access road crossings during operational use of road for maintenance of infrastructure.	**INDIRECT, CUMULATIVE**	***LOW -***		**VERY LOW -**
	NO-GO IMPACT: Ongoing alteration and disturbance of the watercourses over the long-term, due to widespread overgrazing, cultivation and other land uses, as well as more localised disturbances such as	**NO-GO: INDIRECT, CUMULATIVE**	***LOW -***	• *Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing*	**N/A**

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	the use of existing access roads, collectively leading to decreased vegetation cover and increased run-off, erosion and sedimentation, particularly during storm and flood events			*authority to implement measures to address existing impacts.*	
ECOLOGICAL CONNECTIVITY AND EDGE DISTURBANCE IMPACTS	Inadequate rehabilitation of disturbed areas may lead to the reduction of ecological connectivity and degradation of the surrounding environment.	**DIRECT, INDIRECT**	***LOW -***	***Remediate/rehabilitate:*** • *Disturbed areas should be rehabilitated and re-vegetated.*	**VERY LOW -**
	Reduction of ecological connectivity between sections of watercourse units at and downstream over the long-term due to existing land uses.	**NO-GO: INDIRECT, CUMULATIVE**	***LOW -***	*Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing authority to implement measures to address existing impacts.*	**N/A**
WATER POLLUTION IMPACTS	Routine maintenance may lead to the introduction of chemical / hazardous substances (e.g. oil spills from vehicles, etc.) into the watercourses, soil and/or groundwater, adversely affecting the watercourses in the broader area.	**DIRECT**	***LOW -***	• *Avoid/prevent impact:* • *No machinery must be parked overnight within 50 m of the watercourses.* • *All stationary machinery must be equipped with a drip tray to retain any oil leaks.* • *Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it.* • *All general waste and refuse must be*	**VERY LOW -**

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				removed from site and disposed and windproof temporary storage area before being disposed of at a registered landfill site. • *Remediate/rehabilitate:* • *Emergency plans must be in place in case of spillages onto bare soil or within water courses.*	
	Reduction of water quality over the long-term due to existing land uses (particularly livestock grazing and cultivation), as well as ongoing erosion and sedimentation of watercourses.	**NO-GO: INDIRECT, CUMULATIVE**	***LOW -***	*Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing authority to implement measures to address existing impacts.*	**N/A**
AVIFAUNAL IMPACT ASSESSMENT					
DISTURBANCE AND DISPLACEMENT	Disturbance and displacement by operational activities such as power line and turbine maintenance, fencing, and noise can lead to birds avoiding the area for feeding or breeding, and effectively leading to habitat loss and a potential reduction in breeding success.	**DIRECT**	**MODERATE -**	• *A site specific operational EMPr must be developed and implemented, which gives appropriate and detailed description of how operational and maintenance activities must be conducted to reduce unnecessary disturbance;* • *All contractors are to adhere to the EMPr and must apply good environmental practice during all operations;* • *The ECO must be trained by an*	**LOW -**

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				avifaunal specialist to identify the potential priority species and Red Data species as well as the signs that indicate possibly breeding by these species. If a priority species or Red Data species is found to be breeding (e.g. a nest site is located) on the operational WEF, the nest/breeding site must not be disturbed and an avifaunal specialist must be contacted for further instruction; and • *Operational phase bird monitoring, in line with the latest available guidelines, must be implemented.*	
DIRECT MORTALITY – COLLISION WITH INFRASTRUCTURE	WEFs can cause bird fatalities through the collision of birds with moving turbine blades.	**DIRECT**	**HIGH-**	• *WTGs must not be constructed within (or encroach within) any High or Medium Sensitivity areas identified by the VERA model;* • *WTGs are to be micro-sited to avoid blade tips from encroaching within these areas pending the specifics of final WTG dimensions;* • *Additional mitigation (as detailed below) must be implemented for WTGs placed within High and Medium sensitivity areas determined outside of VERA modelled areas;* • *Shut down-on-demand orgood Blade Painting (contingent on approval by the Civil Aviation Authority) or similar technology must be implemented for*	**MODERATE -**

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				all WTGs that are positioned within or encroach on High and Medium Sensitivity areas; • *Internal power lines must be buried wherever technically feasible;* • *Appropriate (approved) Bird Flight Diverters (BFDs) must be affixed to the entire length of novel overhead power lines (in all sensitivity categories);* • *If one or more avifaunal SCC carcasses are located and determined likely to have resulted from collisions with infrastructure in any sensitivity area over the lifespan of the facility, the fatality is to be appropriately recorded and reported to an avifaunal specialist to determine the most appropriate action;* • *If double layers of fencing are required for security purposes, they should be positioned at least 2 m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences;* • *Develop and implement a carcass search and bird activity monitoring programme in-line with the latest applicable guidelines;* • *Regular reviews of operational phase*	

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				monitoring data (activity and carcass) and results to be conducted by an avifaunal specialist; • *The above reviews should strive to identify sensitive locations including WTGs and areas of increased collisions that may require additional mitigation;* • *An operational monitoring programme for any novel overhead power lines must be implemented to locate potential collision fatalities; and* • *Any fatalities located must be reported to Birdlife South Africa (BLSA) and the Endangered Wildlife Trust (EWT).*	
DIRECT MORTALITY - ELECTROCUTION	Electrocution refers to the scenario where a bird is perched or attempts to perch on energized structures and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components. Overhead power line infrastructure with a capacity of 132 kV or more does not generally pose a risk of electrocution due to the large	**DIRECT**	**LOW -**	• *Internal power lines should be buried wherever possible;* • *All new overhead power line pylons must be of a design that minimizes electrocution risk. This can be achieved by using adequately insulated 'bird friendly' structures, with sufficient clearances between live components; and* • *An operational monitoring programme for the overhead power line route must be implemented to locate potential collision fatalities.*	**LOW -**

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	size of the clearances between the electrical infrastructure components. Electrocutions are therefore more likely for larger species whose wingspan is able to bridge the gap such as eagles or storks. A few large birds (such as Verreaux's Eagle), susceptible to electrocution (particularly in the absence of safe and mitigated structures) occur in the area. Electrocution is also possible on electrical infrastructure within the substation particularly for species such as crows and owls.				
CUMULATIVE IMPACT ON AVIFAUNAL HABITAT, DISPLACEMENT AND DIRECT MORTALITY	At least 6 onshore wind facilities and onshore wind/solar PV combined facilities are being considered according to the DFFE Renewable Energy database (Q3 2022) within 50 km of the proposed development site, mostly towards the town of De Aar the north-east. In addition to these, the Britstown WEF Complex comprises 5 WEFs on the neighbouring properties.	**INDIRECT, CUMUALTIVE**	**HIGH -**	• *All appropriate mitigation measures listed above should be implemented;* • *Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management.*	**MODERATE -**
BAT IMPACT ASSESSMENT					

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MORTALITY DUE TO WIND TURBINE COLLISION AND/OR BAROTRAUMA	Bats can be impacted during the operational phase by means of collision with wind turbines and/or barotrauma. These impacts will be limited to species that make use of the airspace within the rotor swept zone of the wind turbines, during foraging, commuting and/or migration activities. Such impacts would also be further exacerbated with potential light pollution that would be present during operational activities. Certain bat species actively forage around artificial lights due to the higher numbers of insects which are attracted to these lights. This would bring these species into the vicinity of the operating turbines and increase the risk of collision/barotrauma for these species.	**DIRECT AND CUMULATIVE**	**HIGH -**	• *Implement an operational phase bat monitoring programme, in accordance with the most recent version of the operational phase bat monitoring guidelines.* • *Implement blade feathering (up to the manufacturers cut-in speed) as soon as operation begins, to prevent free-wheeling.* • *The placement of all turbines, as well as their full blade length, should avoid high sensitivity areas, to be considered from the outset of the design phase.* • *If residual impacts reach the threshold limit (at any wind turbine), then appropriate minimisation measures should be implemented (turbine curtailment and/or acoustic deterrence mechanisms).* • *Lighting at the project should be kept to a minimum at all associated infrastructures. Appropriate types of lighting are to be used to avoid attracting insects, and hence, bats. This includes downward facing low-pressure sodium and warm white LED lights. To be considered from the*	**MODERATE -**

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				outset of the design phase.	
DISTURBANCE/DISPLACEMENT	WEF's have the potential to impact bats indirectly during the operational phase through the disturbance of roosts or when conducting O&M activities during hours of important bat foraging activities. Excessive noise and dust during the operational phase could also result in bats abandoning their roosts, depending on the proximity of operational activities to roosts.	**INDIRECT** **NO-GO**	**MODERATE -** **NO IMPACT**	▲ *Limit O&M activities to daylight hours.* ▲ *Avoid all O&M activities for wind turbines and associated infrastructures within potential bat roosting habitats. No confirmed bat roosts have been identified on site to date, although it is recommended that a suitably qualified bat specialist (appointed to conduct the operational phase bat monitoring programme) is to further advise on refining recommendations pertaining to O&M activities as new roosting information becomes available, during the project's operational phase (if relevant).*	**LOW -** **N/A**
BAT FATALITY IMPACTS ON A CUMULATIVE SCALE	Multiple WEF's impacting bats collectively, could have the potential to cause significant loss to affected species over a regional or national scale with an inability for the affected species to recover from such loss. This is likely to be most significant through bat mortality as a result of wind turbine collisions and/or barotrauma during the projects' operational phase, particularly during bat foraging/commuting activities. Presently, at least 4 onshore wind and solar PV facilities, as well as 3 wind	**CUMULATIVE**	**HIGH -**	▲ *All mitigation measures, as listed in Table 7, are highly recommended for WEFs in the greater (50 km2) Project area, to reduce the probability of significant mortality impacts occurring at Soyuz 1 WEF, and subsequently on a cumulative scale as well.* ▲ *Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive management processes across projects.*	**MODERATE -**

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	energy facilities are being considered according to the DFFE Renewable Energy database (Q3 2022), within a 50 km region of the proposed Soyuz 1 WEF. Five additional wind energy facilities (Soyuz 2 WEF, Soyuz 3 WEF, Soyuz 4 WEF, Soyuz 5 WEF and Soyuz 6 WEF) are however known to be presently under assessment for EA application.				
ECOLOGICAL IMPACT ASSESSMENT					
DISTURBANCE TO FAUNAL SPECIES AND THEIR LIVELIHOOD DUE TO OPERATIONAL RELATED ACTIVITIES	Operational activities may create noise, dust and vibrations that fauna experience periodically for the duration of the operational phase. These activities could disturb animals and their livelihood activities to some extent. Infrastructure may create barriers that impact on faunal movements e.g. fences, walls	**DIRECT**	**MODERATE -**	▲ *All vehicles must be maintained e.g. the sound generated by a vehicle must be below a certain decibel as prescribed in the relevant noise control regulations.* ▲ *No night lighting must be allowed. If required, Minimise lighting in open space areas within development and any external lights must be down lights placed as low as possible and installation of low UV emitting lights, such as most LEDs.* ▲ *Development must be designed to allow unencumbered movement, especially of small faunal species. e.g.* ○ Permeable internal and external fences/walls (if any) must be implemented to allow for the movement of fauna through the	**LOW -**
	NO IMPACTS	**NO-GO**	**NO IMPACTS**		**NO IMPACTS**

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				development. These must have ground level gaps of 10cm x 10cm at 10m intervals. These gaps must be kept free of obstructions, including plant growth and debris. ○ All guttering and kerbstones must to allow for easy movement of small fauna ○ Steep sided drains, gutters and canals must be covered with mesh (5mm x 5mm) or sloped to prevent fauna falling in and getting stuck.	
FAUNAL MORTALITY DUE TO ROADKILL AND PERSECUTION	Maintenance vehicles and project operation related monitoring may cause faunal mortalities due to collision.	**DIRECT**	**MODERATE -**	*Speed restrictions within the project area for all vehicles (30km/h is recommended) should be in place to reduce the impact of killed fauna on the project roads.* *No night driving should be permitted, if unavoidable, this must be restricted, and speed limits adhered to.* *Any faunal species that may die as a result of collision must be recorded (i.e. be photographed, GPS co-ordinates taken) and placed on the EWT Roadkill App.* *A clause relating to fines, possible dismissal and legal prosecution must*	**LOW -**
	NO IMPACTS	**NO-GO**	**NO IMPACTS**		**NO IMPACTS**

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				be included in all contracts for ALL personnel (i.e. including contractors) working on site should any speeding or persecution of animals occur.	
INCREASED REDUCTION IN FAUNAL HABITAT AND INCREASE DISTURBANCE OF FAUNAL SPECIES	The cumulative impact associated with all six WEF will result in the combined loss of faunal habitat across all six sites and faunal species that will move due to the disturbance may have to move further as adjacent habitat will be impacted on as well.	**CUMULATIVE**	**HIGH -**	*Refer to mitigation measures above.*	**MODERATE -**
INCREASED FAUNAL MORTALITY	Removal of faunal habitat and land levelling machinery may cause mortalities of faunal species sheltering or taking refuge within the habitat, such as reptiles, amphibians and small rodents that shelter in rocky crevices. Contractor vehicles may cause faunal mortalities due to collision. In addition, species perceived as a threat are known to be persecuted e.g. snakes.	**CUMULATIVE**	**HIGH -**		**MODERATE -**
INFESTATION OF ALIEN PLANT SPECIES	If laydown areas and roads are not rehabilitated, these disturbed areas can become places for alien invasive species to become established, and if left unmitigated, these species	**DIRECT**	**HIGH -**	⅄ *The site must be checked regularly for the presence of alien invasive species. When alien invasive species are found, immediate action must be taken to remove them.* ⅄ *The prickly pears currently noted on*	**LOW -**

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	can spread and establish themselves in intact vegetation, resulting in the displacement of indigenous species and possible local extinctions of SCC. Six exotic species were recorded within the site, one (prickly pear – Opuntia ficus-indica) of which is listed as a Category 1b invasive.			*site must be removed and disposed of.* • *An alien invasive management plan must be incorporated into the EMPr.* • *The ECO must create a list with accompanying photographs of possible alien invasive species that could occur on site prior to construction. This photo guide must be used to determine if any alien invasive species are present.*	
	Cumulative Impact: The cumulative impact associated with all known WEFs in the area could increase the infestation of alien invasive plant species in the area if this is not mitigated.	**CUMULATIVE AND DIRECT**	**HIGH -**		**LOW -**
	No-Go Impact: If the project does not go ahead, the vegetation would remain intact and there will be limited disturbance resulting in the infestation of alien species. The impact associated with this will be of low significance.	**NO-GO**	**LOW -**		**NO IMPACT**
HERITAGE IMPACT ASSESSMENT					
LOSS OF HERITAGE RESOURCE FOR S1WEF01, S1WEF02, S1WEF03	It is understood that no new areas will be disturbed and/or impacted during the operations phase of the project and the risk and severity of heritage impacts should decrease once the	**DIRECT**	**LOW -**	*No further action / Monitoring* *Where no heritage resources have been documented, heritage resources occur well outside the impact zone of any development or the primary context of*	**LOW -**

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	projects activate. Furthermore, the majority of sites of archaeological and heritage significance would have been recorded and/or assessed in preceding phases. However, impact on previously undetected archaeological sites, human burials and the cultural landscape might occur as a result of operational activities (site access, movement, maintenance, trespassing, natural elements, hazards etc). During the Operations Phase, the continuation of management measures for the Historical Period veewagtershuis site (**S1WEF02**) should be tracked and continuous ECO site monitoring will be required.			*the surroundings at a development footprint has been largely destroyed or altered, no further immediate action is required. Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage\ remains are destroyed.* *Site Monitoring:* *General Site Monitoring in order to detect the presence of and limit impact on previously undocumented heritage receptors during construction / site clearing / earth moving* *Avoidance*	
LOSS OF HERITAGE RESOURCE FOR S1WEF04 - S1WEF14	It is understood that no new areas will be disturbed and/or impacted during the operations phase of the project and the risk and severity of heritage impacts should decrease once the projects activate. Furthermore, the majority of sites of archaeological and heritage significance would have been recorded and/or assessed in preceding phases. However, impact on previously undetected archaeological sites, human burials and the cultural landscape might occur as a result of operational activities (site access,	**DIRECT**	**LOW + /-**	*This is appropriate where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. Mitigation is not acceptable or not possible. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.* *Mitigation* *This is appropriate where development occurs in a context of heritage significance and where the impact is such*	**LOW +/ -**

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	movement, maintenance, trespassing, natural elements, hazards etc). During the Operations Phase, the continuation of management measures for the Historical Period veewagtershuis site (**S1WEF02**) should be tracked and continuous ECO site monitoring will be required.			*that it can be mitigated to a degree of medium to low significance, e.g. the high to medium impact of a development on an archaeological site could be mitigated through sampling/excavation of the remains. Not all negative impacts can be mitigated.* *Compensation* *Compensation is generally not an appropriate heritage management action. The main function of management actions should be to conserve the resource for the benefit of future generations. Once lost it cannot be renewed. The circumstances around the potential public or heritage benefits would need to be exceptional to warrant this type of action, especially in the case of where the impact was high.* *Rehabilitation* *Rehabilitation is considered in heritage management terms as an intervention typically involving the adding of a new heritage layer to enable a new sustainable use. It is not appropriate when the process necessitates the removal of previous historical layers, i.e. restoration of a building or place to the previous state/period. It is an appropriate heritage management action in the following cases:* *- The heritage resource is degraded or in*	
CUMULATIVE	It is the opinion of the Specialist that the proposed Soyuz 1 Wind Energy Facility and its associated power line connection will have a low negative cumulative impact on the heritage value of the area for the following reasons: - The low frequency of significant archaeological resources documented in the project area and in its immediate surroundings implies low-severity short and long-term impacts on the heritage landscape. In addition, localised and spatially confined heritage resources can easily be avoided by project design of individual turbines, pylon placements and service roads. - The significance of the landscape in terms of its heritage is bound not to change during the course of construction, operation and decommissioning of the project.	**CUMULATIVE**	**LOW -**		**LOW -**

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	- The proposed Soyuz 1 WEF is situated in region which has seen the rapid development of vast and large-scale renewable energy facilities such as the Maanhaarberg WEF, the Great Karoo Renewable Energy Facility, the Modderfontein WEF and many Solar PV Developments around the town of De Aar. The developments cumulatively add to a transformed landscape and sense of place where the character of this portion of the Karoo is evolving into a centre for renewable power generation. - It should be noted that archaeological knowledge and the initiation of research projects into significant archaeological sites often result from Heritage Impact Assessments conducted for developments. Provided that significant archaeological sites are conserved and that appropriate heritage mitigation and management procedures are followed, the cumulative impact of development can be positive.			*the process of degradation and would benefit from rehabilitation.* *- Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric.* *- Where the rehabilitation process will not result in a negative impact on the intrinsic value of the resource.*	
NOISE IMPACT ASSESSMENT					
DAYTIME OPERATION OF WTG CONSIDERING THE WORST-CASE SPL	WTG will only operate during period with increased winds, when ambient sound levels are higher than periods with no or	**DIRECT** **CUMULATIVE** **NO-GO**	**LOW -** **INSIGNIFICANT** **NO IMPACT**	*The significance of the noise impact is low and no additional mitigation is recommended.* *There is no risk of any residual noise.*	**LOW -** **INSIGNIFICANT** **NO IMPACT**

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	low winds. As discussed and motivated in section 6.4 (as proposed in Table 6 2 and illustrated in Figure 4 52) of the Specialist Noise Report, ambient sound levels will likely be higher, with this assessment assuming an ambient sound level of 41.5 dBA. Numerous WTG of the Soyuz 1 WEF operating simultaneously during the day will increase ambient sound levels due to air-borne noise from the WTG. The projected noise levels and the change in ambient sound levels is defined for the identified NSR in Appendix F, Table 6(pre-mitigation) of the Specialist Noise Report.				
NIGHT-TIME OPERATION OF WTG CONSIDERING THE WORST-CASE SPL	WTG will only operate during period with increased winds, when ambient sound levels are higher than periods with no or low winds. As discussed and motivated in section 6.4 (as proposed in Table 6 2 and illustrated in Figure 4 53 of the Specialist Noise Report), ambient sound levels will likely be higher with this assessment	**DIRECT** **CUMULATIVE** **NO-GO**	**HIGH** **INSIGNIFICANT** **NO IMPACT**	• *The significance of the noise impact is High and additional mitigation is required and recommended. Potential mitigation measures would include:* • *Agreement between the applicant and the land owner that the structures near NSR07 will not be used for residential purposes if the project proceed; or* • *That the applicant designs and*	**LOW -** **INSIGNIFICANT** **NO IMPACT**

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	assuming an ambient sound level of 41.5 dBA. Numerous WTG of the Soyuz 1 WEF operating simultaneously at night will increase ambient sound levels due to air-borne noise from the WTG. The projected noise levels, the change in ambient sound levels as well as the potential noise impact is defined per NSR in Appendix F, Table 6(pre-mitigation) and summarized in this table. The potential noise level (and significance) when using a quieter WTG (such as the Nordex N163 5.X WTG with the reported SPL of 107.2 dBA re 1 pW) is presented in Appendix F, Table 7(post-mitigation) of the Specialist Noise Report.			*implement a noise abatement programme to ensure that the projected noise levels are less than 45dBA at NSR07 (during periods that the structures are used for residential purposes). This could include using a WTG (within 2,000 m from NSR07) that has different sound reduction modes (such as a WTG with a noise emission level less than 106.5 dBA re 1pW); or* • *The applicant can use a WTG within 2,000m from NSR07 with a SPL less than 106.5 dBA (re 1 pW); or* • *The applicant can change the layout, removing WTG B6-57 (or relocating it further than 2,000m from this NSR), at the same time moving other WTG (WTG B6-56, B6-59 and B6-60) further than 1,000m from NSR07; or* • *The applicant can do both of the following:* • *change the layout, removing WTG B6-57 (or relocating it further than 2,000m from this NSR); and* • *select a WTG with a SPL less than 108.5 dBA (re 1 pW) within 2,000m from NSR07 (WTG B6-56, B6-59 and B6-60).* • *There is no risk of residual noise.*	
POTENTIAL CUMULATIVE NOISE IMPACTS	Numerous WTG from various WEFs (such as the other Soyuz	**DIRECT** **CUMULATIVE**	**NO IMPACT** **LOW -**	• *The significance of the potential cumulative noise impact is low and*	**NO IMPACT** **LOW -**

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	projects) operating simultaneously with increases in ambient sound levels due to air-borne noise from the WTG. The projected noise levels, the potential change in ambient sound levels as well as the significance of the potential noise impact defined per NSR in Appendix F, Table 8(pre-mitigation) in the Specialist Noise Report. Considering the projected noise levels as defined in Appendix F, Table 8(pre-mitigation) in the Specialist Noise Report, there is an insignificant risk for a cumulative noise impact.	**NO-GO**	**NO IMPACT**	*additional mitigation is not required or recommended.*	**NO IMPACT**
PALAEONTOLOGICAL IMPACT ASSESSMENT					
None identified by specialist					
SOCIAL IMPACT ASSESSMENT					
POSITIVE ATTITUDE TOWARDS THE DEVELOPMENT	Overall feelings in the town were overwhelmingly positive, and in the surrounding farms feelings were generally positive towards the WEF.	**DIRECT**	**MODERATE +**	⅄ *Good communication about the project needs to be practiced throughout as both locals and businesses need time to plan accordingly for any changes that will occur in the area.* ⅄ *Ensure that notice is given and landowners and locals are properly informed throughout the project.*	**MODERATE +**
HIGH COMMUNITY	Expectations are high among members	**DIRECT**	**MODERATE +**	⅄ *Good communication about the*	**MODERATE +**

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EXPECTATIONS FOR BENEFITS RESULTING FROM THE PROJECT	of the local community in terms of what the development will offer and contribute, especially where it may improve their livelihoods.			*project needs to be practiced throughout as both locals and businesses need time to plan accordingly for any changes that will occur in the area.* • *Ensure that notice is given and landowners and locals are properly informed throughout the project.* • *A positive relationship must be established and maintained with affected landowners. There should always be an open line of communication and grievances must be addressed satisfactorily and promptly.* • *Affected landowners must be consulted and respected in terms of access to the site, security and all activities on the site, in order to minimise negative impacts to landowners. Disruptions to directly affected and adjacent landowners must be kept to a minimum.* • *Complaints and concerns must be addressed promptly, and feedback must be given to complainants.*	
JOB CREATION: OPERATION	A number of employment opportunities will be created during the operation phase.	**DIRECT, INDIRECT, CUMULATIVE**	**HIGH +**	• *Hiring should focus on the nearest and surrounding community. If not, jealousy and disdain or resentment for the project may develop.* • *Unreasonable expectations with regards to employment*	**HIGH +**

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				opportunities should not be created, and the developers should be transparent about the limited number of employment opportunities that will be created.	
SMME DEVELOPMENT	AHIGs part of the WEF's LED programme, development of SMMEs may be supported.	**DIRECT, INDIRECT AND CUMULATIVE**	**HIGH +**	• *Ensure local SMME's are utilised throughout the project, as far as possible.* • *The creation of secondary opportunities for income generation, such as supplying meals to employees, should be investigated and implemented if possible.* • *External contractors and suppliers from within the local municipality must be given preference.* • *Source materials and products locally, as far as possible.*	**HIGH +**
POSSIBILITY FOR TRAINING AND UPSKILLING OF LOCAL COMMUNITY DURING CONSTRUCTION, OPERATION AND THROUGH LED PROJECTS	There may be an opportunity to provide training and develop skills during both construction and operation phases. It is anticipated that there may also be such opportunities arising from the WEF's LED programme subsequent to commencement of operation.	**DIRECT**	**MODERATE +**	• *It is recommended that these be maximised whenever possible, and that the local community, especially, be the beneficiaries of this.*	**MODERATE +**
IN-MIGRATION OF JOB SEEKERS	A large-scale in-migration of people in search of work is often a concern associated with new developments. However, this usually applies to larger developments, and is not expected to happen in a large scale in the instance of the WEF.	**DIRECT**	**LOW -**	• *No mitigation possible.*	**LOW -**

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NOISE FROM OPERATION	Noise from wind turbines may cause disturbance, especially during night time.	**DIRECT**	**MODERATE -**	• *Mitigation measures proposed by the Noise specialist must be adhered to.*	**LOW -**
THERE MAY BE SENSITIVE HERITAGE FEATURES ON THE SITE THAT MAY BE IMPACTED	There may be sensitive heritage features on the site that may be impacted.	**DIRECT**	**MODERATE -**	*Recommendations and mitigation measures contained in the Heritage Impact Assessment must be adhered to.*	**MODERATE -**
POSSIBLE REDUCTION IN CRIME RATES	The presence of the project could possibly reduce the rate of petty theft and stock theft in the area. People may also resort less to crime if they obtain legitimate incomes through employment or business opportunities.	**DIRECT, INDIRECT, CUMULATIVE**	**LOW +**	*Measures should be taken to ensure security around any construction site, including maintaining access control onto affected farms.* *Affected landowners must be consulted and respected in terms of access to the site, security and all activities on the site, in order to minimise negative impacts to landowners.*	**LOW +**
LOSS OF AGRICULTURAL LAND	A small amount of agricultural land (used for grazing currently) will be lost to the wind turbines and access roads, but this will not be significant.	**DIRECT**	**LOW -**	*N/A*	**LOW -**
NEGATIVE VISUAL IMPACT ANDLOSS OF SENSE OF PLACE	WEFs invariably have a visual impact on an area. Many people perceive this as negative, and as spoiling the sense of place.	**DIRECT**	**MODERATE -**	*Mitigation measures suggested by the visual impact specialist must be adhered to.*	**MODERATE -**
LOSS OF INCOME DUE TO VISUAL IMPACTS	The presence of the WEF may negatively impact a hunting establishment in that international clientele seek the specific aesthetic of the desolate landscape, which will change as a result of the WEF.	**DIRECT, INDIRECT AND CUMULATIVE**	**LOW -**	*N/A*	**LOW -**
ADDITIONAL SUPPLY OF ENERGY	There is currently considerable need	**DIRECT,**	**HIGH +**	*N/A*	**HIGH +**

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TO THE NATIONAL GRID	and demand for additional electrical power and particularly for electricity from renewable and other diverse sources. This project will positively contribute to meeting these needs.	**INDIRECT, CUMULATIVE**			
TRAFFIC IMPACT ASSESSMENT					
NOISE AND POLLUTION	Very little noise and pollution is expected during the operation of the WEF.	**DIRECT**	**LOW -**	• *Schedule any trips arising for maintenance of wind turbines or other components outside peak traffic periods.*	**LOW -**
TRAFFIC IMPACTS	Trips for the operational phase will be limited to permanent staff and maintenance.	**DIRECT**	**LOW -**		**LOW -**
TRAFFIC IMPACTS AND ASSOCIATED NOISE AND DUST POLLUTION	The cumulative impact assumes that all approved developments will be operational at the same time, which would increase noise, pollution and traffic on surrounding road network.	**CUMULATIVE**	**MODERATE -**		**LOW -**
VISUAL IMPACT ASSESSMENT					
OTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY (< 5KM) TO THE PROPOSED DEVELOPMENT	The visual impacts of facility operations on sensitive visual receptors in close proximity to the proposed Soyuz 2 WEF (within 5km) is expected to be of very high significance. Sensitive receptors in this zone consist of observers travelling along the N12, various secondary and internal farm roads, as well as residents of various homesteads (refer to Section 6.6 for a full list). Homesteads located on farm portions	**DIRECT**	**VERY HIGH -**	• *Operations:* • *Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.* • *Maintain the general neat and tidy appearance of the facility as a whole.* • *Monitor rehabilitated areas, and implement remedial action as and when required.* • *Decommissioning:* • *Remove infrastructure not required*	**VERY HIGH -**
		CUMULATIVE	*Cumulative impact ratings have been scored at the end of the visual impact assessment section*		
		NO-GO	**NO IMPACT**		**NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	earmarked for the Britstown Wind Farm Cluster reduce the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated visual impacts). No mitigation is possible for a facility of this scale, but measures have been included as best practice guidelines Cumulative: The construction of the Soyuz 2 WEF (75 turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region. Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.			*for the post-decommissioning use of the site.* • *Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.* • *Monitor rehabilitated areas post-decommissioning and implement remedial actions*	
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS WITHIN THE LOCAL AREA (BETWEEN 5 - 10KM) SURROUNDING THE PROPOSED	The visual impact of facility operations on sensitive visual receptors (i.e. users of the various roads and residents of homesteads) within the local area (between 5 - 10km offset) is expected to be of high significance. Sensitive	**DIRECT** **CUMULATIVE**	**HIGH -** *Cumulative impact ratings have been scored at the end of the*	• *Site development & Operation:* • *Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.*	**HIGH -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
DEVELOPMENT	visual receptors within this zone include residents on the southern outskirts of Britstown, users traveling along the N12, R398 and various secondary roads in the area, as well as residents of various homesteads (refer to Section 6.6 for a full list). Homesteads located on farm portions earmarked for the Britstown Wind Farm Cluster reduce the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated visual impacts). No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines. Cumulative impact: The construction of the Soyuz 2 WEF (75 turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region. Residual Impact: The visual impact will	*visual impact assessment section* **NO-GO**	*visual impact assessment section* ***NO IMPACT***	• *Retain natural pockets (wetland, river and other sensitive vegetation zones) as buffers within the property and along the perimeter.* • *Dust suppression techniques should be in place at all times during the site development and operational phases.* • *Access roads will require an effective dust suppression management programme, such as regular wetting and/or the use of non-polluting chemicals that will retain moisture in the road surface.* • *Keeping infrastructure at minimum heights.* • *Introducing landscaping measures such as vegetating berms.* • *Avoid the use of highly reflective material.* • *Metal surfaces, where they occur, should be painted in natural soft colours that would blend in with the environment.* • *Maintain the general neat and tidy appearance of the site as a whole.* *<u>Lighting</u>* • *Lighting should be kept to a minimum wherever possible.* • *Install light fixtures that provide precisely directed illumination to*	**NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.			*reduce light "spillage" beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties.* • *Wherever possible, lights should be directed downwards to avoid illuminating the sky.* • *Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement.*	
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS WITHIN THE DISTRICT (BETWEEN 10 - 20KM) SURROUNDING THE PROPOSED DEVELOPMENT	The visual impact of facility operations on sensitive visual receptors within the district (between 10 - 20km offset) is expected to be of moderate significance. Sensitive visual receptors within this zone include users traveling along portions of the N10, R398, R384 and various secondary roads, visitors to the Smartt Syndicate Dam, as well as residents of various homesteads (refer to Section 6.6 for a full list). Homesteads located on farm portions earmarked for the Britstown Wind Farm Cluster reduce the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated	**DIRECT**	**MODERATE -**	<u>*Site development & Operation:*</u> • *Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.* • *Retain natural pockets (wetland, river and other sensitive vegetation zones) as buffers within the property and along the perimeter.* • *Dust suppression techniques should be in place at all times during the site development and operational phases.* • *Access roads will require an effective dust suppression management programme, such as regular wetting and/or the use of non-polluting chemicals that will retain moisture in*	**MODERATE -**
		CUMULATIVE	*Cumulative impact ratings have been scored at the end of the visual impact assessment section*		
		NO-GO	**NO IMPACT**		**NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	visual impacts). No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines Cumulative impact: The construction of the Soyuz 2 WEF (75 turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region. Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.			*the road surface.* • *Keeping infrastructure at minimum heights.* • *Introducing landscaping measures such as vegetating berms.* • *Avoid the use of highly reflective material.* • *Metal surfaces, where they occur, should be painted in natural soft colours that would blend in with the environment.* • *Maintain the general neat and tidy appearance of the site as a whole.* • *<u>Lighting</u>* • *Lighting should be kept to a minimum wherever possible.* • *Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties.* • *Wherever possible, lights should be directed downwards to avoid illuminating the sky.* • *Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement.*	
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON	The visual impact of facility operations on sensitive visual receptors within the	**DIRECT** **CUMULATIVE**	**LOW -** *Cumulative*	*<u>Site development & Operation:</u>* • *Retain / re-establish and maintain*	**LOW -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
SENSITIVE VISUAL RECEPTORS WITHIN THE REGION (> 20KM)	region (beyond the 20km offset) is expected to be of low significance. Sensitive visual receptors within this zone include users traveling along portions of the N10, N12, R398 and R384, as well as residents of various homesteads (refer to Section 6.6 for a full list). Homesteads located on farm portions earmarked for the Britstown Wind Farm Cluster reduce the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated visual impacts). No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines Cumulative: The construction of the Soyuz 2 WEF (75 turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region. Residual Impacts: The visual impact will	*impact ratings have been scored at the end of the visual impact assessment section* **NO-GO**	*impact ratings have been scored at the end of the visual impact assessment section* **NO IMPACT**	*large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.* • *Retain natural pockets (wetland, river and other sensitive vegetation zones) as buffers within the property and along the perimeter.* • *Dust suppression techniques should be in place at all times during the site development and operational phases.* • *Access roads will require an effective dust suppression management programme, such as regular wetting and/or the use of non-polluting chemicals that will retain moisture in the road surface.* • *Keeping infrastructure at minimum heights.* • *Introducing landscaping measures such as vegetating berms.* • *Avoid the use of highly reflective material.* • *Metal surfaces, where they occur, should be painted in natural soft colours that would blend in with the environment.* • *Maintain the general neat and tidy appearance of the site as a whole.* • *<u>Lighting</u>* • *Lighting should be kept to a*	**NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.			*minimum wherever possible.* • *Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties.* • *Wherever possible, lights should be directed downwards to avoid illuminating the sky.* • *Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement.*	
POTENTIAL VISUAL IMPACT OF OPERATIONAL LIGHTING AT NIGHT ON SENSITIVE VISUAL RECEPTORS IN THE REGION	The receiving environment has a relatively small number of populated places, and it can be expected that any light trespass and glare from the security and after-hours operational lighting for the facility will have some significance. In addition, the remote sense of place and rural ambiance of the local area increases its sensitivity to such lighting intrusions. Another source of glare light is the aircraft warning lights mounted on top of the hub of the wind turbines. While these lights are less aggravating due to the toned-down red colour, they do	**DIRECT**	**HIGH -**	<u>*Planning & operation*</u>*:* • *Aviation standards and CAA Regulations for turbine lighting must be followed.* • *The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, must be investigated.* • *Install aircraft warning lights that only activate when the presence of an aircraft is detected, if permitted by CAA.* • *Shield the sources of light by physical barriers (walls, vegetation, or the structure itself).*	**MODERATE -**
		CUMULATIVE	*Cumulative impact ratings have been scored at the end of the visual impact assessment section*		
		NO-GO	**NO IMPACT**		**NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	have the potential to be visible from a greater distance than general operational lighting, especially due to the strobing effect of the lights, a function specially designed to attract the viewers' attention. The Civil Aviation Authority (CAA) prescribes these warning lights and the potential to mitigate their visual impacts is low. The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, is recommended to be investigated. Some ground breaking new technology in the development of strobing lights that only activate when an aircraft is detected nearby. This may aid in restricting light pollution at night and should be investigated and implemented by the project proponent, if available and permissible by the CAA. This new technology is referred to as *needs-based night lights*, which basically deactivates a wind turbine's night lights when there is no flying object within the airspace of the WEF. The system relies on the active detection of aircraft by radar sensors, which relay a switch-on signal to the			• *Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights.* • *Make use of minimum lumen or wattage in fixtures.* • *Make use of down-lighters, or shielded fixtures.* • *Make use of Low-Pressure Sodium lighting or other types of low impact lighting.* • *Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.*	

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	central wind farm control to activate the obstacle lights. Last is the potential lighting impact is known as sky glow. Sky glow is the condition where the night sky is illuminated when light reflects off particles in the atmosphere such as moisture, dust or smog. The sky glow intensifies with the increase in the number of light sources. Each new light source, especially upwardly directed lighting, contributes to the increase in sky glow. The general lighting of the facility may contribute to the effect of sky glow in an otherwise dark environment. The visual impacts as a result of operational lighting at night on sensitive visual receptors in the region is likely to be of high significance and may be mitigated to moderate should the required CAA lighting be approved to be installed on the perimeter and/or the installation of *needs-based night lights* be allowed. Best practice guidelines for other general site lighting that may occur on the site have also been taken into consideration. The table below illustrates this impact assessment.				

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	Cumulative impacts: The operation of the Soyuz 2 WEF (75 turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased lighting and light pollution in an otherwise natural area increasing the cumulative visual impact of renewable energy facilities in the region. Residual Impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.				
POTENTIAL VISUAL IMPACT OF SHADOW FLICKER ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED DEVELOPMENT	Shadow flicker only occurs when the sky is clear, and when the turbine rotor blades are between the sun and the receptor (i.e. when the sun is low). De Gryse in Scenic Landscape Architecture (2006) found that "most shadow impact is associated with 3-4 times the height of the object". Based on this research, a 1km zone around each turbine has been identified as the zone within which there is a risk of shadow flicker occurring. No homesteads are located within the 1km. It is expected that motorists	**DIRECT** **CUMULATIVE** **NO-GO**	**MODERATE -** *Cumulative impact ratings have been scored at the end of the visual impact assessment section* **NO IMPACT**	▲ *Planning & operation:* ▲ *Adjust wind turbine locations to reduce the number of receptors likely to experience shadow flicker.* ▲ *Consult with participating landowners or identified receptors who may experience shadow flicker impacts to identify feasible and reasonable management and mitigation measures, should they be required.* ▲ *Installation of screening structures and/ or planting of trees to block shadows cast by the turbines on the identified affected receptors.*	**LOW -** **NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	travelling along secondary and internal farm roads within the 1km zone of a turbine could potentially experience shadow flicker, however the shadow flicker experienced by these motorists will be fleeting and not constitute a shadow flicker visual impact of concern. Cumulative impacts: The operation of the Soyuz 2 WEF (75 turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased lighting and light pollution in an otherwise natural area increasing the cumulative visual impact of renewable energy facilities in the region. The significance of shadow flicker is therefore anticipated to be moderate before mitigation and low post mitigation. Residual impact: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.			➢ *Investigate the use of turbine control strategies which shut down the offending turbines when shadow flicker is likely to occur on identified receptors is investigated.*	
ANCILLARY INFRASTRUCTURE	On-site ancillary infrastructure associated with the Soyuz 2 WEF	**DIRECT** **CUMULATIVE**	**MODERATE -** *Cumulative*	*Planning:* ➢ *Retain/re-establish and maintain*	**MODERATE -**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
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	includes a permanent laydown area, Battery Energy Storage System (BESS), internal overhead lines between the substations, permanent met masts, three on-site substations, access roads to and between project components inclusive of stormwater infrastructure, as well as operation and maintenance buildings, including a gate house, security building, control centre, offices, warehouses and workshops, etc. No dedicated viewshed analyses have been generated for the ancillary infrastructure, as the range of visual exposure will fall within (and be overshadowed by) that of the turbines. The anticipated visual impact resulting from this infrastructure is likely to be of moderate significance both before and after mitigation. Residual Impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		*impact ratings have been scored at the end of the visual impact assessment section*	*natural vegetation in all areas outside of the development footprint/servitude, but within the project site.* *Operations:* ➢ *Maintain the general neat and tidy appearance of the infrastructure.* *Decommissioning:* ➢ *Remove infrastructure not required for the post-decommissioning use.* ➢ *Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications*	
		NO-GO	**NO IMPACT**		**NO IMPACT**
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON THE VISUAL CHARACTER OF THE LANDSCAPE AND SENSE OF PLACE OF THE REGION	Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria and specifically the visual character of	**DIRECT** **CUMULATIVE**	**HIGH -** *Cumulative impact ratings have been scored at the*	*Planning:* *Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.*	**HIGH -**

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	an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, etc.) play a significant role. A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light. In general, the landscape character of the greater study area and site itself presents as rural in character with wide open, undeveloped landscapes. The visual quality of the region is generally high with tracts of intact vegetation as well as, hills and rocky outcrops characterising most of the visual environment. As such, the entire study area is considered sensitive to visual impacts due to its generally low levels of transformation. The anticipated visual impact on the visual character and sense of place of the study area is expected to be of high significance. No mitigation is possible within this environment and for a facility of this scale, but measures have	*end of the visual impact assessment section* **NO-GO**	**NO IMPACT**	➢ *Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised.* ➢ *Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible, and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.* ➢ *<u>Construction:</u>* ➢ *Rehabilitate all construction areas.* ➢ *Ensure that vegetation is not cleared unnecessarily to make way for infrastructure.* ➢ *<u>Operations:</u>* ➢ *Maintain the general neat and tidy appearance of the facility as a whole.* ➢ *Monitor rehabilitated areas, and implement remedial action as and when required.*	**NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	been included as best practice guidelines Cumulative impacts: The construction and operation of the Soyuz 2 WEF (75 turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region. Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.			• *<u>Decommissioning:</u>* • *Remove infrastructure not required for the post-decommissioning use of the site.* • *Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.* • *Monitor rehabilitated areas post-decommissioning and implement remedial actions.*	
POTENTIAL CUMULATIVE VISUAL IMPACT OF WIND ENERGY FACILITIES WITHIN THE REGION	It is a requirement that a visual specialist identify and quantify the cumulative visual impacts of a proposed development, propose potential mitigating measures and conclude if the proposed development will result in any acceptable loss of visual resources taking into consideration the other proposed and operational projects in the area. A cumulative visual impact can be defined as the combined or incremental effects resulting from changes caused by a proposed development in conjunction with other	**DIRECT**		• *None are available.*	
		CUMULATIVE: *Overall impact of the proposed project considered in isolation*	**MODERATE -**		
		CUMULATIVE: *Cumulative impact of the project and other projects in the area*	**HIGH -**		
		NO-GO	**NO IMPACT**		**NO IMPACT**

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	existing or proposed activities. The cumulative impact assessed in the table below will consist of the combined impact of the proposed Soyuz 2 WEF and the five other proposed facilities that form part of the Britstown Wind Farm Cluster. Cumulative visual impacts may be experienced as a result of where a combination of several WEF's turbines is within a receptors line of sight at the same time, where the receptor has to turn their head to see several of the turbines of the different WEF's or when the receptor has to move from one viewpoint to another to either see different developments or different views of the same development (such as when travelling along a road). The cumulative visual impact is not just the totality of the impacts of two developments. The combined impact may be greater than the sum of the two individual developments, or in rare cases even less. The cumulative visual impact is assessed as the product of the distance between the individual WEFs (or turbines), the total distance over which the turbines are visible, the general character of the landscape and				

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS					
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**MITIGATION MEASURES**	**SIGNIFICANCE POST-MITIGATION**
	its sensitivity to that specific typology of development, the location and design of the WEFs themselves and lastly the way in which the landscape is experienced by the sensitive receptors. The table below illustrates the assessment of the anticipated cumulative visual impact of infrastructure on sensitive visual receptors within the region. The cumulative visual impacts are likely to be of high significance when the proposed Soyuz 2 WEF and the five other proposed facilities that form part of the Britstown Wind Farm Cluster are in operation. Residual impact: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.				
DECOMMISSIONING PHASE ****DUE TO THE FACT THAT NO WIND ENERGY FACILITY'S HAVE BEEN DECOMMISSIONED IN SOUTH AFRICA, CES BELIEVES IT RESPONSIBLE TO STIPULATE THAT FUTHER ASSESSMENT IN THE FORM OF A DECOMISSIONING ENVIRONMENTAL MANAGEMENT PROGRAMME BE DRAFTED, IN CONSULTATION WITH SPECIALISTS, WHEN THIS PHASE BECOMES RELEVANT.**					
AQUATIC IMPACT ASSESSMENT					
The aquatic impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.					
AVIFAUNAL IMPACT ASSESSMENT					

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

9.4 SUMMARY OF FINDINGS AND COMPARATIVE ASSESSMENT OF IMPACTS

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

9.4.1 GENERAL IMPACTS

All the general negative impacts could be mitigated to either LOW negative or MODERATE negative. Of the 50 impacts, 24 are direct and indirect impacts, while 26 are cumulative impacts. No-go impacts are not represented in this summary and can be found in Section 9.2 and Appendix H.

Table 9-6: General Impact Summary

PHASE	IMPACT PRE-MITIAGTION									IMPACT POST-MITIAGTION								
	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
Planning & Design	0	0	4	0	6	0	0	0	12	0	0	0	0	0	0	0	0	
Construction	0	0	12	0	7	0	0	0	18	0	3	0	0	0	0	0	0	
Operation	0	0	6	0	2	2	0	0	7	0	2	0	0	2	0	0	0	
Decommission	0	2	8	0	0	0	0	0	8	2	0	0	0	0	0	0	0	
SUM	**0**	**2**	**30**	**0**	**16**	**2**	**0**	**0**	**45**	**2**	**5**	**0**	**0**	**2**	**0**	**0**	**0**	

9.4.2 AGRICULTURE IMPACT

The agricultural impacts are all 9 impacts of LOW and MEDIUM significance pre- mitigation. Both the MEDIUM and LOW impacts pre-mitigation are LOW significance post-mitigation.

Table 9-7: Agricultural Impact Summary.

PHASE	IMPACT PRE-MITIAGTION									IMPACT POST-MITIAGTION								
	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
AGRICULTURAL																		
Planning & Design	0																	
Construction	3		4							7		0						
Operation	1		1							2								
Decommission	0																	
SUM	4	0	5	0	0	0	0	0		9	0	0	0	0	0	0	0	

9.4.3 AVIFAUNAL IMPACT

The Avifaunal Impact Assessment rated most of its impacts as HIGH and LOW negative pre-mitigation. Of all negative pre-mitigation impacts 8 impacts, 5 can be mitigated to LOW negative post-mitigation significance, while the remaining 3 can be mitigated to MODERATE negative significance.

Table 9-8: Avifaunal Impact Summary.

PHASE	IMPACT PRE-MITIAGTION									IMPACT POST-MITIAGTION								
	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
AVIFAUNAL																		

Planning & Design																		
Construction	3				1					3		1						
Operation	1		1		2					2		2						
Decommission																		
SUM	4	0	1	0	3	0	0	0		5	0	3	0	0	0	0	0	

9.4.4 BAT IMPACT

The Bat Impact Assessment identified 3 operational impacts and rated 3 as HIGH negative pre-mitigation. All impacts can be mitigated to LOW or MODERATE post-mitigation significance.

Table 9-9: Bat Impact Summary.

PHASE	IMPACT PRE-MITIAGTION									IMPACT POST-MITIAGTION								
	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
BATS																		
Planning & Design																		
Construction			2							2								
Operation			1		2					1		2						
Decommission																		
SUM	0	0	3	0	2	0	0	0		3	0	2	0	0	0	0	0	

9.4.5 ECOLOGICAL IMPACT (BOTANICAL AND FAUNAL)

Of the 23 ecological impacts identified, 50% of the impacts are of a HIGH and Majority of other 50% are MEDIUM negative pre-mitigation significance. These impacts can be mitigated to 6 impacts as LOW negative significance and 12 impacts MODERATE negative significance. No high impacts were identified in the post-mitigation phases.

Table 9-10:: Ecological Impact Summary.

PHASE	IMPACT PRE-MITIAGTION									IMPACT POST-MITIAGTION								
	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
ECOLOGICAL																		
Planning & Design																		
Construction	3		7		6					2		12						
Operation	1		2		4					4								
Decommission																		
SUM	4	0	9	0	10	0	0	0		6	0	12	0	0	0	0	0	

9.4.6 FRESHWATER IMPACT

Of the 17 Aquatic and Wetland impacts identified, 2 of the impacts are of a MODERATE and the remaining 15 are LOW negative pre-mitigation significance. These impacts can be mitigated to 100% LOW negative significance. No high impacts were identified in the pre- or post-mitigation phases.

Table 9-11: Aquatic Impact Summary.

PHASE	IMPACT PRE-MITIAGTION									IMPACT POST-MITIAGTION								
	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
AQUATIC																		

Planning & Design																		
Construction	8		2							10								
Operation	7									4								
Decommission																		
SUM	15	0	2	0	0	0	0	0		14	0	0	0	0	0	0	0	

9.4.7 HERITAGE IMPACT

The pre-mitigation heritage impacts are all rated as LOW negative significance. The low frequency of significant archaeological resources documented in the project area and in its immediate surroundings implies low-severity impacts on the heritage landscape. In addition, localised and spatially confined heritage resources can easily be avoided by project design of individual turbines, pylon placements and service roads. The impacts can be all be mitigated to LOW negative significance post-mitigation.

Table 9-12: Heritage Impact Summary.

PHASE	IMPACT PRE-MITIAGTION									IMPACT POST-MITIAGTION								
	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
HERITAGE																		
Planning & Design																		
Construction	3									3								
Operation	3									3								
Decommission																		
SUM	6	0	0	0	0	0	0	0		6	0	0	0	0	0	0	0	

9.4.8 NOISE IMPACT

The noise impacts based on the current layout are majority 8 impacts LOW negative significance and 3 impacts HIGH negative significance pre- mitigation. All impacts were LOW negative significance post-mitigation.

Table 9-13: Noise Impact Summary.

PHASE	IMPACT PRE-MITIAGTION									IMPACT POST-MITIAGTION								
	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
NOISE																		
Planning & Design																		
Construction	6				2					8								
Operation	2				1					3								
Decommission																		
SUM	8	0	0	0	3	0	0	0		11	0	0	0	0	0	0	0	

9.4.9 PALAEONTOLOGY IMPACT

The 2 pre-mitigation impacts are each Moderate and HIGH negative significance pre- mitigation. All 2 impacts were LOW negative post- mitigation.

Table 9-14: Palaeontology Impact Summary.

PHASE	IMPACT PRE-MITIAGTION	IMPACT POST-MITIAGTION

	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
PALAEONTOLOGICAL																		
Planning & Design																		
Construction			1		1					2								
Operation																		
Decommission																		
SUM	0	0	1	0	1	0	0	0		2	0	0	0	0	0	0	0	

9.4.10 Socio-Economic Impact

The social study identified 27 impacts, comprising 13 negative impacts and 14 positive impacts related to the proposed development. The negative impacts are almost equally of a MODERATE and LOW negative significance, with no HIGH negative pre-mitigation significance. There are no high negative post-mitigation impacts and the majority of the remaining negative impacts are of a LOW negative significance post-mitigation. Of the 14 positive impacts identified the majority are of a MODERATE OR HIGH positive significance pre-mitigation, with 2 LOW positive pre-mitigation impacts. Post-mitigation, 7 are of the impacts are MODERATE positive, 5 HIGH positive and 12 LOW positive. It is clear that with mitigation measures in place the positive impacts can be enhanced.

Table 9-15: Social Impact Summary

PHASE	IMPACT PRE-MITIAGTION									IMPACT POST-MITIAGTION								
	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
SOCIAL																		
Planning & Design																		
Construction	4	1	3	4		2				5	1	2	4		2			
Operation	3	1	3	3		3				4	1	2	3		3			
Decommission																		
SUM	7	2	6	7	0	5	0	0		9	2	4	7	0	5	0	0	

9.4.11 Traffic Impact

Of the 6 impacts identified, 3 of the impacts are of a MODERATE, 2 are LOW negative pre-mitigation significance and 1 is of HIGH significance. These impacts can be mitigated to 5 LOW negative significance and only 1 MEDIUM negative significance. No high impacts were identified in the post-mitigation phases.

Table 9-16: Traffic Impact Summary.

PHASE	IMPACT PRE-MITIAGTION									IMPACT POST-MITIAGTION								
	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
TRAFFIC																		
Planning & Design																		
Construction			2		1					2		1						
Operation	2		1							3								
Decommission																		
SUM	2	0	3	0	1	0	0	0		5	0	1	0	0	0	0	0	

9.4.12 VISUAL IMPACT

The Visual Assessment identified a total of 11 impacts. The majority of these impacts related to the visual impact of the proposed WEF on sensitive receptors during the operation of the WEF. There are 5 HIGH and 1 VERY HIGH negative significance impacts that cannot be mitigated due to the fact that they are perception-based. Cumulative impacts were listed as 1 HIGH negative significance and 1 MODERATE significance pre-mitigation and were not classified post-mitigation.

Table 9-17: Visual Impact Summary

PHASE	IMPACT PRE-MITIAGTION									IMPACT POST-MITIAGTION								
	LOW		MODERATE		HIGH		V HIGH			LOW		MODERATE		HIGH		V HIGH		
Positive/negative	-	+	-	+	-	+	-	+		-	+	-	+	-	+	-	+	
VISUAL																		
Planning & Design																		
Construction					1							1						
Operation	1		4		4		1			2		3		2		1		
Decommission																		
SUM	1	0	4	0	5	0	1	0		2	0	4	0	2	0	1	0	

9.4.13 CUMULATIVE IMPACT

Overall, the cumulative impact of the proposed Soyuz 1 WEF, when neighbouring existing and authorised WEFs are considered is HIGH negative before mitigation. Cumulative impacts, as previous stated, are notoriously difficult to mitigate since environmental legislation, related to monitoring, construction and operation, changes over time. Developers are therefore not always prescribed the same standards of environmental care. In addition to this, cumulative impacts can only be assessed using available data and in some cases older EIAs did not assess impacts to the same level of detail, e.g. specialist studies can vary drastically, which means that data is often limited.

It is concluded that majority of the post-mitigation cumulative impacts are MODERATE in nature and although the many of the cumulative impacts of the proposed Soyuz WEF cluster in the area will be HIGH, the fact that the same developer is developing the cluster of WEFs, resulting in the standard of the EMPr and ECOs being consistent means that this can be mitigated to MODERATE.

9.4.14 NO-GO ALTERNATIVE

The no-go alternatives of the remainder of the impacts mean that the site and its surrounding remain as is (status quo). This means that the negative impacts described in this report would not transpire and nor would the positive impacts.

10 SENSITIVITY ANALYSIS

A site development sensitivity map (Figure 10-1) was developed based on specialist and general site information gathered, and the site was classified into areas of low and conditional sensitivity and NO-GO no development).

- NO-GO areas included areas of high sensitivity indicated by the bird and bat specialists (specific to turbines, rather than roads), identified heritage sites and buffers around existing infrastructure (including a 500m buffer around all noise sensitive areas).
- **Conditional Sensitivity** areas are areas where construction is conditional on the fulfilment of one or another aspect-specific requirement. For example, all construction in the Heritage conditional sensitivity areas will require sign-off by a palaeontologist to ensure that no fossils (if found) are damaged or destroyed. Other conditional sensitivity areas include areas of moderate sensitivity identified by the bird and bat specialist and ecologically sensitive areas such as watercourses, wetlands, and thicket vegetation.
- **Low Sensitivity** areas are areas where construction may take place without hindrance.

The main objective of the sensitivity analysis is to guide development away from sensitive areas and have development footprints located in areas of lower sensitivity. We have previously used the terms go area; do-but area; and no-go area.

The limitation of the above is that a no-go area is just that – one cannot ever do anything in this area, because its **no-go.** But in certain cases, development is required. A road crossing over a stream, or some other linear infrastructure, which can be developed, provided there is sound mitigation and other constraints are applied. So, it is not no-go but developmentally constrained.

It is therefore preferable to use and map the following categories:

NONE IDENTIFIED - These areas can be easily developed, as there are only minor constraints, and little mitigation and management is required (aside from normal building design and construction restrictions outlined in the EMPr).

LOW CONSTRAINT – These areas can be developed but require mitigation and management as per the general management conditions of the EMPr.

MODERATE CONSTRAINT - These areas can accommodate development, but there are constraints. Mitigation and management will be required to reduce significant environmental impacts to acceptable levels, and appropriate technology (sewage, waste etc.) and design will be required to reduce impacts and ensure sustainability. Sound arguments as to why the development cannot be located in less sensitive areas will be required to justify locating development in moderately constrained areas.

MODERATE-HIGH CONSTRAINT – These areas can accommodate development, but there are strict constraints. Mitigation and management will be required to reduce significant environmental impacts to acceptable levels. Sound arguments as to why the development cannot be located in less sensitive areas will be required to justify locating development in moderately-high constrained areas.

HIGH CONSTRAINT - If development takes place in these areas, considerable effort (and most likely expense) will be required to design out, mitigate or manage negative environmental impacts.

NO-GO CONSTRAINT – areas included areas of high sensitivity indicated by the bird and bat specialists (specific to turbines, rather than roads), identified heritage sites and buffers around existing infrastructure (including a 500m buffer around all noise sensitive areas).

The proposed Soyuz 1 WEF has avoided all NO-GO areas identified by the various specialists. Figure 10-1 overlays all sensitive areas identified by these specialists. The following sensitivities are relevant to the proposed WEF site:

- All specialist constraints (including **NO-GO**, **HIGH**, **MODERATE-HIGH**, **MODERATE**, **LOW** and **NONE**
- Avifaunal sensitivity:
  - VERA areas **NO-GO**
  - Primary foraging habitat **HIGH**
  - Migratory routes **MODERATE**
- Agricultural sensitivity:
  - High land capability (arable) **HIGH**
  - Moderate land capability (grazing) **MODERATE**
  - Low land capability (lower density grazing) **LOW**
- Bat sensitivity:
  - Roost areas **NO-GO**
- Habitats (Fauna and Flora - The habitats and the species of conservation concern in the project area were assessed based on their conservation importance (CI), functional integrity (FI) and receptor resilience (RS)
  - High CI and FI, Low RS **VERY HIGH**
  - High CI, FI and Moderate RS **HIGH**
  - High CI, FI and RS **MODERATE**
  - Moderate CI, High Fi, High RS **LOW**
  - Low CI, FI, Very High RS **VERY LOW/NONE**
- Heritage
  - Burials **HIGH**
  - Stone Age Sites, Historical Period Settlements **MODERATE**
- Northern Cape CBA:
  - CBA 1 **HIGH**
  - CBA 2 **MODERATE-HIGH**
  - ESAs **LOW**
- Noise sensitive receptors:
  - 500m buffer **HIGH**
  - 1000m buffer **MODERATE**
  - 2000m buffer **LOW**
- NBA (2018) Threatened Ecosystems:
  - Critical **NO-GO**
  - Endangered **HIGH**
  - Vulnerable **MODERATE-HIGH**
- Riparian areas, rivers and drainage lines:
  - Longitudinal washes **HIGH**
  - Lateral washes, Channels, Lowland flats, Pan, Unchanelled, Dams **MODERATE**
  - Mesa-top flats **LOW**

The following table illustrate the placement of turbines within sensitive areas based on the current layout, this table also includes the current proposed turbine coordinates. All proposed turbines for the Soyuz 1 WEF are situated within **MODERATE/HIGH IDENTIFIED SENSITIVITY** areas. The impacts in these areas are mitigable.

Table 10-1: Turbine Sensitivities and Coordinates

TURBINE NUMBER	TURBINE SENSITIVITY	TURBINE COORDINATES	
		South	East
B6-1	High	30°46'38"S	23°33'15"E
B6-2	Moderate	30°46'58"S	23°34'8"E
B6-3	Moderate	30°47'15"S	23°33'44"E
B6-4	Moderate	30°47'57"S	23°23'47"E
B6-5	Moderate	30°47'53"S	23°23'17"E
B6-6	Moderate	30°47'52"S	23°22'43"E

TURBINE NUMBER	TURBINE SENSITIVITY	TURBINE COORDINATES	
		South	East
B6-7	Moderate	30°47'35"S	23°23'34"E
B6-8	High	30°47'30"S	23°23'3"E
B6-9	Moderate	30°47'32"S	23°24'11"E
B6-10	High	30°46'58"S	23°23'18"E
B6-11	Moderate	30°47'40"S	23°24'55"E
B6-12	Moderate	30°47'0"S	23°24'23"E
B6-13	Moderate	30°46'37"S	23°24'19"E
B6-14	Moderate	30°46'25"S	23°23'47"E
B6-15	Moderate	30°46'51"S	23°24'51"E
B6-16	Moderate	30°46'9"S	23°24'24"E
B6-17	Moderate	30°47'41"S	23°25'28"E
B6-18	Moderate	30°47'24"S	23°25'36"E
B6-19	Moderate	30°46'44"S	23°25'14"E
B6-20	Moderate	30°46'15"S	23°24'58"E
B6-21	Moderate	30°46'50"S	23°26'5"E
B6-22	Moderate	30°48'55"S	23°29'59"E
B6-23	Moderate	30°46'24"S	23°25'45"E
B6-24	Moderate	30°45'49"S	23°25'15"E
B6-25	Moderate	30°45'53"S	23°25'45"E
B6-26	Moderate	30°46'12"S	23°26'13"E
B6-27	Moderate	30°49'42"S	23°28'51"E
B6-28	Moderate	30°45'43"S	23°26'5"E
B6-29	Moderate	30°47'41"S	23°26'32"E
B6-30	Moderate	30°47'23"S	23°26'43"E
B6-31	Moderate	30°47'38"S	23°29'27"E
B6-32	Moderate	30°46'7"S	23°26'41"E
B6-33	Moderate	30°47'49"S	23°27'44"E
B6-34	Moderate	30°47'21"S	23°27'25"E
B6-35	Moderate	30°46'40"S	23°27'10"E
B6-36	Moderate	30°50'21"S	23°27'37"E
B6-37	Moderate	30°49'45"S	23°27'36"E
B6-38	Moderate	30°49'14"S	23°27'37"E
B6-39	High	30°48'30"S	23°27'51"E
B6-40	Moderate	30°48'7"S	23°28'11"E
B6-41	Moderate	30°48'48"S	23°27'42"E
B6-42	Moderate	30°47'23"S	23°28'12"E
B6-43	Moderate	30°47'3"S	23°28'13"E
B6-44	Moderate	30°46'42"S	23°28'3"E
B6-45	Moderate	30°47'55"S	23°28'35"E
B6-46	Moderate	30°47'34"S	23°28'44"E
B6-47	High	30°47'19"S	23°28'55"E
B6-48	High	30°46'58"S	23°28'43"E
B6-49	Moderate	30°46'47"S	23°26'48"E
B6-50	Moderate	30°49'8"S	23°28'14"E
B6-51	Moderate	30°48'55"S	23°28'27"E
B6-52	Moderate	30°49'55"S	23°28'25"E
B6-53	Moderate	30°49'36"S	23°29'25"E
B6-54	Moderate	30°49'18"S	23°29'30"E
B6-55	Moderate	30°48'53"S	23°29'8"E
B6-56	Moderate	30°48'27"S	23°29'12"E
B6-57	Moderate	30°48'21"S	23°29'57"E
B6-58	Moderate	30°47'58"S	23°30'7"E
B6-59	Moderate	30°47'38"S	23°30'18"E

SOYUZ 1 WIND ENERGY FACILITY

TURBINE NUMBER	TURBINE SENSITIVITY	TURBINE COORDINATES	
		South	East
B6-60	Moderate	30°48'23"S	23°30'57"E
B6-61	Moderate	30°47'57"S	23°30'49"E
B6-62	High	30°47'33"S	23°30'54"E
B6-63	High	30°47'52"S	23°31'15"E
B6-64	Moderate	30°48'55"S	23°31'19"E
B6-65	Moderate	30°48'38"S	23°31'40"E
B6-66	Moderate	30°48'22"S	23°31'49"E
B6-67	High	30°47'42"S	23°31'41"E
B6-68	High	30°47'35"S	23°32'3"E
B6-69	High	30°47'17"S	23°32'5"E
B6-70	Moderate	30°47'29"S	23°22'35"E
B6-71	High	30°47'13"S	23°32'38"E
B6-72	High	30°46'52"S	23°32'47"E
B6-73	Moderate	30°48'21"S	23°33'48"E
B6-74	High	30°47'51"S	23°33'2"E
B6-75	Moderate	30°47'19"S	23°33'20"E

SUMMARY	TURBINE SENSITIVITY
NO-GO	0
HIGH SENSITIVITY	14
HIGH/MODERATE SENSITIVITY	0
MODERATE SENSITIVITY	61
LOW/MODERATE SENSITIVITY	0
LOW/NO IDENTIFIED SENSITIVITY	0

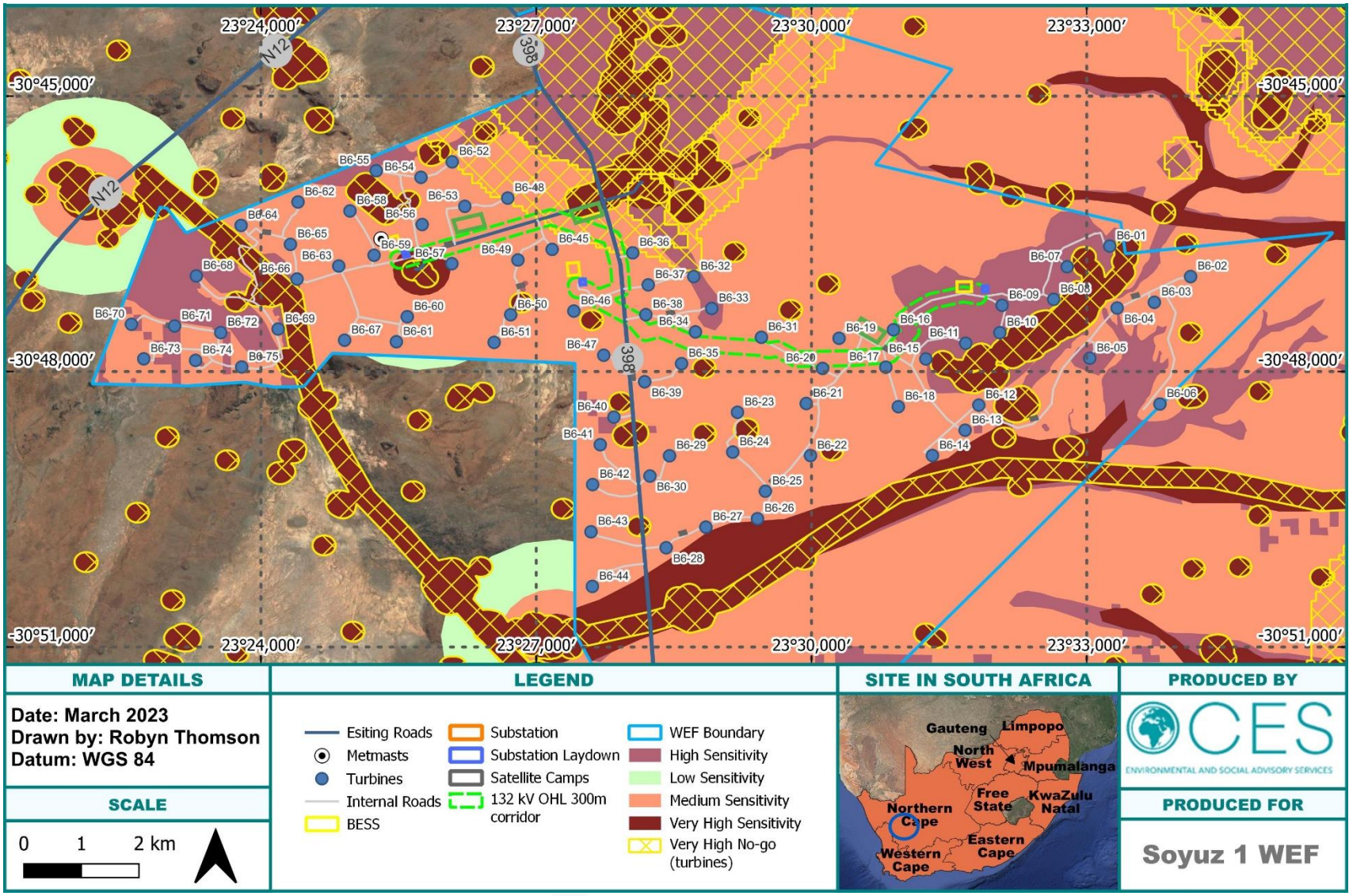

Figure 10-1: Soyuz 1 WEF Site Sensitivity

11 PUBLIC PARTICIPATION

11.1 NOTIFICATION OF INTERESTED AND AFFECTED PARTIES

Public consultation is a legal requirement throughout the EIA process according to the NEMA EIA Regulations (2014, as amended). 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 (DFFE). 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 be attached as APPENDIX C.

11.1.1 NEWSPAPER ADVERTISEMENT

- 1st Advert: Volksblad, 9 September 2022, please see APPENDIX C.
- 2nd Advert: Volksblad, 3 March 2023, proof to be included in the Final EIR.

11.1.2 ONSITE NOTICES

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

11.1.3 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. All relevant organisations (Table 11-1) were invited to comment on the Draft Scoping Report and will also be provided an opportunity to comment on the Draft EIR. 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 11-1: 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
Emthanjeni Local Municipality

Emthanjeni LM Ward 8 Councillor
SALGA Northern Cape
South African Heritage Resources Agency (SAHRA)
Telkom
Sentech
Vodacom
MTN
Cell C
Civil Aviation Authority (CAA)
Department of Defence
South African Radio Astronomy Observatory (SARAO)
South African Weather Service
Air Traffic and Navigation Services (ATNS)
Roads (SANRAL/Public Works)
BirdLife South Africa
Endangered Wildlife Trust
WEF LANDOWNERS
Bernard Edgar Raath Elizabeth Lynette Sieberhagen Lemoenkloof Trust Stecarlou Trust Phillip Raath Lemoenkloof Trust
SURROUNDING LANDOWNERS
Andre Raath Andries Grove Andries Marais Andries van Niekerk Davey van den Berg Francois Viljoen Gawie van Heerden George-Martin Lambrechts Gerand Sieberhagen Hendrick Ackerman Izak Theron JJ Mocke Johan du Plessis Johan van Zyl Johan Viljoen JOSEPH & VAN RENSBURG ATTORNEYS MC Dippenaar Mr Andre Raath Mr Wilhelm van Zyl NJS van der Merwe Oloff Paul Philip Theron Philip van der Merwe Pieter Franken Pieter Nel Rikus van der Merwe

Totius du Plessis **Wessel Campher** **Wim van der Merwe** **Zacharias**
REGISTERED INTERESTED AND AFFECTED PARTIES
Rikus van der merwe
Andre van Rensburg
To be added as requests are received

11.1.4 Surrounding and Affected Landowners

The residents of the surrounding areas have been identified and notified of the WEF EIA. Notifications include the contact details of the EAP for the landowners to register themselves and/or submit their comments on the proposed development.

11.1.5 Registered I&APs

Other than I&APs initially identified, all persons requesting to be registered as I&APs have been and will continue to be included in the I&AP database (Table 11-1).

11.1.6 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 was available for public review from the **20th of September 2022 to 21st of October 2022** (30 days, inclusive of one public holiday).

(a) Hard copies of the Draft Scoping Report were made available at:
- Emthanjeni Local Municipality, Mark Street, Britstown

(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 from 9 March 2023 to 11 April 2023 (30 days plus three public holidays).

(a) Hard copies of the Draft Environmental Impact Assessment Report will be available at:
- Emthanjeni Local Municipality, Mark Street, Britstown

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

11.2 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 has been included as Appendix D of the Draft EIA Report and includes responses to comments received throughout the process.

12 CONCLUSIONS

12.1 DESCRIPTION OF THE PROPOSED ACTIVITY

Soyuz 1 (Pty) Ltd, plans to develop, construct and operate a Wind Energy Facility (WEF) 22 km south of Britstown in the Emthanjeni Local 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 Soyuz 1 Wind Energy Facility (WEF) will consist of up to 75 turbines, with a total facility output of up to 480MW. The WEF will also include a Battery Energy Storage System (BESS), temporary and permanent laydown areas, IPP Substations (SS), a Concrete Tower Manufacturing Facility (CTMF), access roads and construction compound (CC) areas. A 14.5 km 132 kV OHL is required in order to connect the internal WEF substations. The construction footprint of the proposed WEF will be up to 215 ha and rehabilitated to an operational footprint of up to 150 ha. 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).

12.2 PREFERRED ALTERNATIVE

Based on the assessment of alternatives, the preferred alternative for the Soyuz 1 WEF consists of:

- **Alternative location 1** – Turbines located on the following farms portions which were selected on the basis of good wind resource potential, land availability and the sites proximity to available Eskom electricity grid capacity (the final layout of the turbines will only be confirmed following the EIA phase of the project).

SOYUZ 1 WEF		
SG DIGIT NUMBER	**FARM NUMBER/PORTION**	**AREA (HA)**
N073C01200000000144000000	0/144	979
N073C01200000000145000001	RE/145	807
N073C01200000000147000010	1/147	255
N073C01200000000147000060	6/147	1 629
N073C01200000000147000090	9/147	926
N073C01200000000147000110	11/147	3 647
N073C01200000000169000010	1/169	4 893
N073C01200000000169000001	RE/169	3 107
	TOTAL	**16243**

- **Alternative energy technology 1** – Wind turbines as a preferred technology as a low carbon emitting and renewable energy resource.
- **Alternative layout 1:** Current proposed layout of up to 75 turbine WEF layout, access route, electrical switching stations and short connecting powerline.
- **Alternative design 1 –** The following turbine design specifications are proposed:
    - WEF Capacity - Up to 480 MW
    - Number of Turbines - Up to 75
    - Hub Height - Up to 160 m
    - Rotor Diameter - Up to 200 m
    - Blade length - Up to 100 m

12.3 NEED AND DESIRABILITY

The need to reduce greenhouse gas emissions and the importance of a secure and diversified energy supply has resulted in a national shift towards the use of renewable energy technologies. In support of this, the national and provincial government has encouraged the utilisation of renewable energy through policy and strategic planning.

12.4 ASSUMPTIONS, LIMITATIONS AND GAPS IN KNOWLEDGE

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

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

12.5 ENVIRONMENTAL COST-BENEFIT ANALYSIS

174 impacts (156 negative impacts) were identified during the EIA process for Soyuz 1. Of the identified impacts, 156 are NEGATIVE pre-mitigation and 146 are NEGATIVE post-mitigation. 18 impacts are POSITIVE pre- and post - mitigation. The outstanding 10 NEGATIVE pre-mitigation impacts were reduced to 'none' post mitigation.

In terms of the mitigation hierarchy the Figures below illustrate the following application.

1) Avoid: No-go areas have been avoided as per Chapter 10 of this report (sensitivity analysis) and no critical un-mitigatable impacts remain. No turbines are situated within areas rated as No-Go.
2) Minimise: Most of the impacts are LOW post-mitigation (69%), having been reduced from predominantly MODERATE pre-mitigation.
3) Offset: N/A as no VERY HIGH biodiversity impacts remain post mitigation.

Given the reduction in impact significance (negative impacts) through the mitigation hierarchy and the number of positive impacts associated with the development, the EAP is of the opinion that the environmental, social and economic cost does not outweigh the environmental, social and economic benefit of the proposed Soyuz 1 WEF.

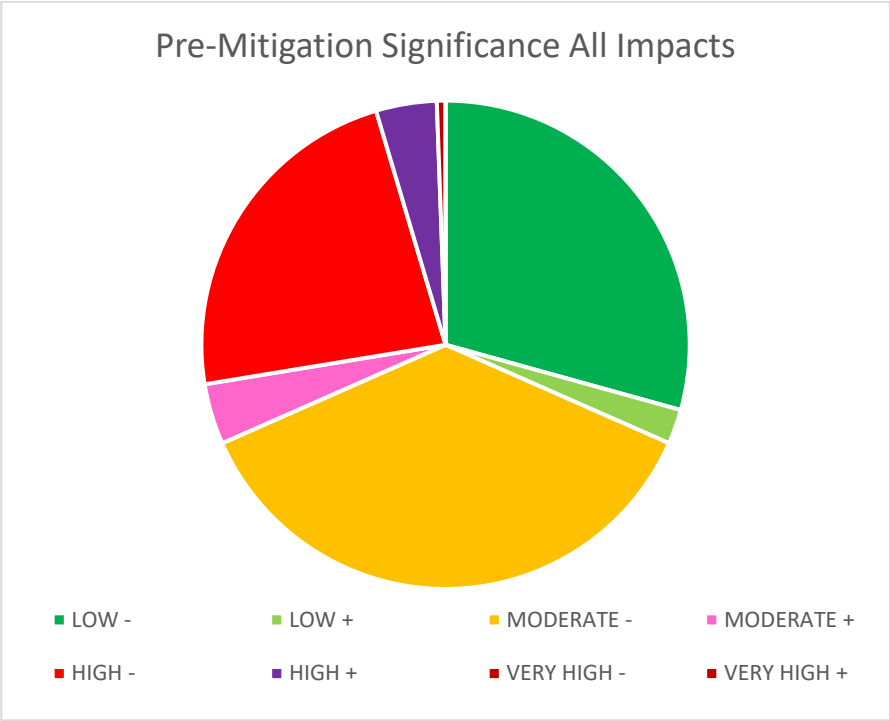

Figure 12-1: Soyuz 1 WEF Full Impact Comparison, Pre-Mitigation

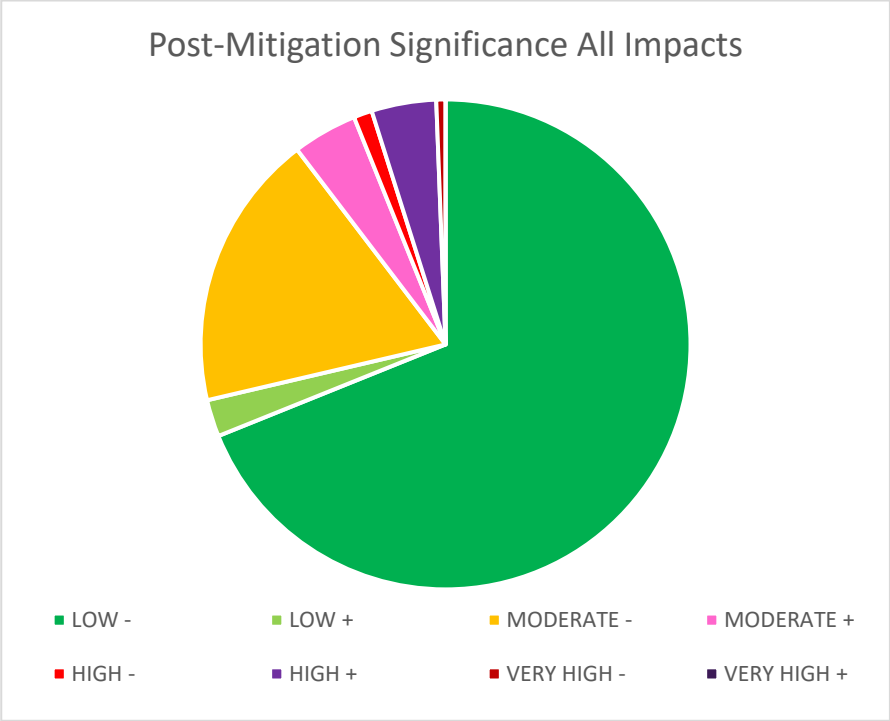

Figure 12-2: Soyuz 1 WEF Full Impact Comparison, Post-Mitigation

12.6 FATAL FLAWS

It is the opinion of the EAP that based on the information gathered during the course of the EIA process, including specialist studies and PPP, the impacts described do not represent any fatal flaws regarding the proposed Soyuz 1 WEF.

12.7 OPINION OF THE EAP

Based on the contents of this report, and all associated documentation, it is the opinion of the EAP that the proposed Soyuz 1 WEF be authorised on condition that all conditions stipulated in Section 12.8 of this report be contained within the EA. The ecological, economic and social trade-offs must be factored in by the department during the decision-making process. It is the opinion of the EAP that site is sensitive from a visual perspective (social), suitable from an ecological perspective (high sensitive areas have been avoided and can be suitably mitigated) and both sensitive and suitable from an economic perspective.

12.8 RECOMMENDATIONS OF THE EAP

Please note that this this list is limited to general recommendations. The specialist recommendations have been included in the EMPr, which must be implemented and adhered to.

12.8.1 PLANNING AND DESIGN RECOMMENDATIONS

The following mitigation measures must be implemented as part of the planning and design 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 must be done early in the planning phase. The necessary road traffic permits must be obtained for transporting parts, containers, materials and construction equipment to the site.
- Careful planning of the routes taken by heavy vehicles must highlight areas of road that may need to be upgraded in order to accommodate these vehicles. Once identified, these areas must be upgraded if necessary.
- All hazardous substances such as paints, diesel and cement must be stored in a bunded area with an impermeable surface beneath them.
- Cement mixing must be conducted at the designated construction camps and/or satellite laydown areas, where practical. This mixing must take place on an impermeable surface, and dried waste cement must be disposed of with building rubble.
- The applicant must ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy. These must include (but not restricted to):
  - Local and District Spatial Development Frameworks
  - Local Municipal bylaws
- In addition, planning for the construction and operation of the proposed energy facility must consider available best practice guidelines, up to date at the proposed time of construction.
- Structures must be located at least 32m away from identified drainage lines (excluding cabling and roads where necessary).
- A Stormwater Management Plan must be designed and implemented to ensure maximum water seepage at the source of water flow.
- The Stormwater Management Plan must also include management mitigation measures for water pollution, wastewater management and the management of surface erosion e.g. by considering the applicability of contouring, etc.
- A Waste Management Plan must be developed for handling onsite waste. This plan must designate an appropriate area where waste can be stored before disposal.
- All general waste must be disposed of at a registered landfill site.
- Wherever possible, construction activities must be undertaken during the driest part of the year to minimize downstream sedimentation due to excavation, etc. When not possible, suitable stream diversions structures must be used to ensure that rivers/streams are not negatively impacted by construction activity.

12.8.2 CONSTRUCTION RECOMMENDATIONS

The following mitigation measures must be implemented during the construction phase:

- Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following

  - Damping down of un-surfaced and un-vegetated areas;
  - Retention of vegetation where possible;
  - Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;
  - A speed limit of 40km/h must not be exceeded on dirt roads;
- Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.
- There must be no burning of construction waste or debris onsite. Cooking is not permitted on site. Smoking on site must be confined to a designated area in the vicinity of the site office which must be equipped with the necessary fire extinguishers.
- The Stormwater Management Plan must be implemented. There must be no earthworks within 32m of the drainage lines to avoid contamination of water sources (excluding for the approved road network).
- The Waste Management Plan, incorporating recycling and waste minimisation, must be implemented. The plan must be explained to all employees as part of the environmental induction training. All waste must be disposed of at an appropriately licensed landfill site.
- The storage of fuels and hazardous materials must be located away from sensitive water resources. All hazardous substances (e.g. diesel, oil drums, etc.) must be stored in a bunded area.
- All construction materials must be stored in a central and secure location with controlled access with an appropriate impermeable surface.
- The recommendations of the Stormwater Management Plan must be implemented to mitigate the impacts of run-off water on pollution.
- The concrete batching plant must be clearly demarcated, and no sprawl must be tolerated.
- Stockpiled excavated material must not be stored within 32m of a watercourse.
- Stockpile areas must be suitably bunded to prevent waterborne erosion of exposed soils where there is a likelihood that the soils will be washed into a watercourse.
- Materials used for infilling must be suitably stabilized to ensure that scour and erosion of the existing bed/banks is exacerbated.
- Subsoil cannot be disposed of onsite without the appropriate Waste License in terms of the NEMA: Waste Act. This must be stipulated in the Waste Management Plan.
- Spoil could be used to rehabilitate open borrow pits or erosion features. Disposal of spoil material to a registered landfill must be the last option. No spoil stockpiles will be allowed to remain onsite once construction activities have ceased.

12.8.3 Operational Recommendations

The following mitigation measures must be implemented during the operational phase:

- All project structures and buildings must be maintained.
- All hazardous substances must be stored in appropriately bunded locations.
- Recommendations of the Stormwater Management Plan must be implemented throughout the lifespan of the project.
- Recommendation of the Waste Management Plan, incorporating recycling and waste minimisation, must be implemented throughout the lifespan of the project.

12.8.4 Decommissioning Recommendations

The following mitigation measures must be implemented during the operational phase:

- This section of mitigation measures must be reassessed by a suitably qualified EAP and specialists prior to decommissioning.
- Littering must be avoided, and litter bins must be made available at various strategic points on site. Refuse from the construction site must be collected on a regular basis and deposited at an appropriate landfill.
- Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following
  - Damping down of un-surfaced and un-vegetated areas;

- Retention of vegetation where possible;
- Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;
- A speed limit of 40km/h must not be exceeded on dirt roads;

- Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.
- Construction vehicles and machinery must make use of existing infrastructure such as roads as far as possible to minimise disturbance on the receiving environment.
- After the removal of all wind turbine-related structures, the disturbed soils must be re-vegetated to avoid unnecessary soil erosion.

Based on current available information the turbines will be removed as per the above specifications. It is recommended that a new and up-to-date impact assessment is undertaken prior to this process to ensure that the latest relevant guidelines and policy on wind farm decommissioning are factored into the process. Should new technology be available to replace the structures then, depending on the legislation relevant at the time, the EAP recommends a new impact assessment process prior to being able to do so. The DFFE would be required to approve any decommissioning or replacement process.

12.8.5 Monitoring Recommendations

- Avifaunal Monitoring:
  - As a minimum, survey protocols used in the pre-application monitoring should be repeated during the first two years of operation and should be combined with monitoring of fatalities. Requirements of the latest available guidelines should be included wherever necessary. The need for further monitoring of bird abundance and movements should be reviewed at the end this of period to determine if it is necessary to continue with some, or all, components of the monitoring.
  - Any observed changes in bird numbers and movements at a WEF could be linked to changes in the available habitat (e.g. agricultural expansion, mining, alien vegetation clearing as well as changes in weather conditions, rainfall, etc.). The avifaunal habitats available on both the development and reference sites should therefore be mapped at least once a year (at the same time every year).
  - In addition to avifaunal abundance, flight activity monitoring and habitat mapping, the post-construction monitoring programme must include fatality monitoring that incorporates carcass searches, as well as scavenger removal (carcass persistence) and searcher efficiency trials.
  - Quarterly monitoring reports should be completed for each site, presenting the results of the previous three months monitoring. Quarterly reports must include the details of carcasses found, including the species, date found, carcass condition (e.g. fresh, decomposed, feathers only), age class and sex (if possible), nearest turbine number, GPS location and proximity to relevant impact receptors (e.g. nests).
  - A post-construction monitoring report analysing the results of monitoring should be completed at the end of each year of monitoring. These reports must be submitted to the competent authority and relevant stakeholders
  - Post-construction monitoring reports must also be made available to environmental assessment practitioners, specialists and scientists for the purposes of environmental audits, environmental impacts assessments, cumulative impact assessments and scientific research
- Bat Monitoring
  - It is considered mandatory for the Soyuz 1 WEF to undertake a suitable operational phase bat monitoring programme by an appropriately qualified bat specialist, particularly in the first two years of project operation. Thereafter, this monitoring programme must be repeated in the fifth year, and every five years thereafter – for the lifespan of the facility. All monitoring must be undertaken in accordance with the most relevant/recent operational phase bat monitoring and threshold guidelines available at the time.
  - Blade feathering should be implemented from the start of operation, as this mitigation has no impact on energy production. Curtailment and acoustic deterrents are the remaining mitigation measures to reduce residual impacts to bats during operation and must be continuously refined and adapted

based on incoming bat fatality data. The need for curtailment and/or deterrents to address residual impacts will only be determined during operations, following analysis of the operational phase monitoring results by the project bat specialist. A suitable curtailment plan with relevant parameters must be drawn up at the time that the requirement becomes necessary.

- When dealing with living animals that can respond in different and unpredictable ways to changing environmental, climatic and developmental parameters, it is very difficult to make guaranteed predictions. Lintott et al. (2016) state that the nightly and seasonal activity data collected during pre-construction surveys may provide an indication of the extent of curtailment that is required and therefore the economic viability of the project, however, they highlight the need for a feedback mechanism for practitioners to share the success or failure of mitigation strategies, i.e. adaptive mitigation. The bat specialist conducting the operational monitoring has the right to make further recommendations should they see fit.
- Given the magnitude and extent of wind-turbine related bat fatalities worldwide, the conservation implications are critically important and bat fatalities must be avoided, minimised or mitigated proactively.

13 APPENDIX A | EAP DECLARATION

PLEASE FIND SIGNED EAP DECLARATION HERE WITHIN

14 APPENDIX B | EAP CVs

PLEASE FIND EAP TEAM CVs HERE WITHIN

15 APPENDIX C | PPP PROOFS

15.1 PROOF OF ADVERTISEMENT

KENNISGEWING VAN AANSOEK VIR OMGEWINGS MAGTIGING VIR DIE SOYUZ 1 WIND ENERGIE FASILITEIT (WEF), EMTHANJENI PLAASLIKE MUNISIPALITEIT, NOORD KAAP PROVINSIE

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 Soyuz 1 Wind Energie Fasiliteit (WEF) binne die Emthanjeni Plaaslike Munisipaliteit van die Noord-Kaap Provinsie. Die Soyuz 1 WEF-projekterrein beslaan ongeveer 16 200 ha en bestaan uit die volgende plaasgedeeltes: Plaas Perdepoort Nr. 169: Oorgeblewe Gedeelte (Gedeelte 0) en Gedeelte 1. Plaas Nieuwejaarsfontein Nr. 147: Gedeelte 11 (van Gedeelte 2), Gedeelte 9 (van Gedeelte 1) en Gedeelte 1; Plaas 145 Oorgeblewe gedeelte (Gedeelte 0); en Plaas 144, Gedeelte 0.

Die aansoeker, Soyuz 1 (Pty) Ltd, stel die ontwikkeling van die Soyuz 1 WEF voor, wat sal bestaan uit tot en met 75 turbines met 'n maksimum naafhoogte van tot en met 160 m en 'n rotor deursnee van tot 200 m, met 'n totale fasiliteitsuitset van tot 480MW. Die verwagte WEF voetspoor is tot en met 150 ha.

Die WEF sal ook 'n transformator aan die basis van elke turbine insluit; beton turbine fondamente; turbine, hyskraan en lem se harde stande; tydelike lêgebiede wat die balkoprigting, berging en monteerarea sal akkommodeer; Battery Energieberging; bekabeling tussen die turbines, wat ondergronds gelê moet word waar prakties; twee substasies op die perseel om die verbinding tussen die windplaas en die elektrisiteitsnetwerk te vergemaklik; toegangspaaie na die terrein en tussen projekkomponente, insluitend stormwaterinfrastruktuur.

Die WEF sal 'n totale padnetwerk van tot 125 km hê; 'n tydelike kampterrein en beton-aanlegte en bedryfs- en instandhoudingsgeboue, insluitend 'n hekhuis, sekuriteitsgebou, beheersentrum, kantore, pakhuise, 'n werkswinkel en besoekersentrum.

Die ontwikkeling van die voorgestelde Soyuz 1 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 (Omgewings Impak Beoordeling 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 OM (Omgewings Magtiging) is die Nasionale Departement van Bosbou, Visserye en die Omgewing (DBVO/'DFFE').

Vir verdere informasie, registrasie as 'n Belanghebbende en/of Geaffekteerde Party (B&GP) of indiening van skriftelike kommentaar, kontak asseblief vir Me Robyn Thomson via pos, telefoon of e-pos: Posbus 8145, Nahoon (Oost London), 5110 | Tel: +27 (0)43 726 7809 | E-pos: ***reppp@cesnet.co.za*** * Sluit asseblief die projek verwysing in by alle korrespondensie: ***Soyuz 1 WEF***.

KENNISGEWING: POPIA ("Protection of Personal Information Act" – Beskerming van Persoonlike Informasie Wet) Vrywaring. Alle Belanghebbende- en Geaffekteerde Party (B&GP)-databasisse moet vanaf 1 Julie 2021 aan die Wet voldoen. Indien u as 'n B&GP op die databasis wil registreer, benodig ons as die administrateurs van die Soyuz 1 WEF 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 jou naam, affiliasie, kontakbesonderhede en skriftelike kommentaar) sigbaar is vir enige persoon wat in die projek belang stel 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.

X1XDNB59-VB090922

Geklassifiseerd

EIENDOMME

AFTREEOORDE TE HUUR

REGSKENNISGEWINGS & TENDERS

HOFBEVELE/ SEKWESTRASIES/ LIKWIDASIES

CES

KENNISGEWING VAN AANSOEK VIR OMGEWINGS MAGTIGING VIR DIE SOYUZ 1 WIND ENERGIE FASILITEIT (WEF), EMTHANJENI PLAASLIKE MUNISIPALITEIT, NOORD KAAP PROVINSIE

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KENNISGEWING VAN AANSOEK VIR OMGEWINGS MAGTIGING VIR DIE SOYUZ 2 WIND ENERGIE FASILITEIT (WEF), EMTHANJENI PLAASLIKE MUNISIPALITEIT, NOORD KAAP PROVINSIE

KENNISGEWING VAN AANSOEK VIR OMGEWINGS MAGTIGING VIR DIE SOYUZ 3 WIND ENERGIE FASILITEIT (WEF), EMTHANJENI EN UBUNTU PLAASLIKE MUNISIPALITEIT, NOORD KAAP PROVINSIE

KENNISGEWING VAN AANSOEK VIR OMGEWINGS MAGTIGING VIR DIE SOYUZ 4 WIND ENERGIE FASILITEIT (WEF), UBUNTU PLAASLIKE MUNISIPALITEIT, NOORD KAAP PROVINSIE

KENNISGEWING VAN AANSOEK VIR OMGEWINGS MAGTIGING VIR DIE SOYUZ 5 WIND ENERGIE FASILITEIT (WEF), UBUNTU PLAASLIKE MUNISIPALITEIT, NOORD KAAP PROVINSIE

KENNISGEWING VAN AANSOEK VIR OMGEWINGS MAGTIGING VIR DIE SOYUZ 6 WIND ENERGIE FASILITEIT (WEF), UBUNTU PLAASLIKE MUNISIPALITEIT, NOORD KAAP PROVINSIE

TOKOLOGO PLAASLIKE MUNISIPALITEIT KENNISGEWING

TOKOLOGO PLAASLIKE MUNISIPALITEIT: HERSIENING VAN DIE MUNISIPALE RUIMTELIKE ONTWIKKELINGSRAAMWERK

WAARSKUWING

KENNISGEWINGS

15.2 PROOF OF SIGNAGE

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

SOYUZ 1 SITE NOTICE PHOTOGRAPHS
Co-ordinates: -30.7382357578, 23.4487241341

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

15.3 ORIGINAL CORRESPONDENCE FROM I&APS

16 APPENDIX D | COMMENTS AND RESPONSE REPORT

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
Andre van Rensburg Branch Manager SANCO 082 931 4609 deaar@sanco.co.za Irvin Road, Industrial Area, De Aar	08/09/2022	I came upon a Notice Application board of yours just outside the town of Britstown in the Northern Cape. I am just sending you a mail regarding the service that we can maybe supply to you. We are a Company based in De Aar that are not very far from site. Just want to find out from you when Project will maybe start in the near future? Please do see attached our Company Profile for your convenience.	CES replied 08/09/2022: "Thank you so much. We are busy with the Environmental Impact Assessment phase at the moment. We will include you on our database and will keep you informed throughout the process." Andre van Rensburg was added as an I&AP to the PPP database and was included in all notifications.
Natasha Higgitt Heritage Officer: Archaeology, Palaeontology and Meteorites Unit SAHRA, 111 Harrington Street, Cape Town, 8001, Western Cape, ZA	20/09/2022	Please note that all development applications are processed via our online portal, the South African Heritage Resources Information System (SAHRIS) found at the following link: http://sahra.org.za/sahris/. We do not accept emailed, posted, hardcopy, faxed, website links or DropBox links as official submissions. Please create **an application on SAHRIS** and upload all documents pertaining to the Environmental Authorisation Application Process. As per section 24(4)b(iii) of NEMA and section 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA), an assessment of heritage resources must form part of the process and the assessment must comply with section 38(3) of the NHRA. If a case already exists on SAHRIS regarding the development, please upload the documents to that case. Once all documents including all appendices are uploaded to the case applications, please ensure that the status of the case is changed from DRAFT to SUBMITTED. Please ensure	CES replied 05/10/2022: "This email serves as confirmation that we have received your response and we have created the applications on SAHRIS and have uploaded all the documentation." All document pertaining to the EIA were uploaded onto the SAHRIS Portal on 23/09/2022. The Draft EIA and associated specialist studies, including the Heritage Assessment and Palaeontological Assessment, will be uploaded onto the SAHRIS Portal at the same time that they are released to the public for comment and review. The officials listed in your correspondence have been included on the I&AP database.

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		that all documents produced as part of the EA process are submitted as part of the application. Please note that I will be on planned sick leave from the 5th October 2022. I will return to the office on the 17th October 2022. Please take note of the Case Officer assigned to cases during that time. Please contact Nokukhanya Khumalo (nkhumalo@sahra.org.za) or Andrew Salomon (asalomon@sahra.org.za) for section 38 applications in the Mpumalanga Province and Sityhilelo Ngcatsha (sngcatsha@sahra.org.za) for section 38 applications in the Northern Cape Province. For all other queries, please contact Phillip Hine (phine@sahra.org.za).	
Martin Zeekoei Private person	20/09/2022	Well Received.	This comment has been recorded. Martin Zeekoei is registered as an I&AP.
Lizna Fourie Department of Water and Sanitation (DWS)	21/09/2022	I see this is for the Northern Cape As I am in the Eastern Cape I will not be involved.	CES replied 29/09/2022: "Thank you for your feedback, we will remove you from the I&AP list for this project." The I&AP was removed from the database.
John Geeringh (Pr Sci Nat) Reg. EAP (EAPASA) Senior Consultant Environmental Management Grid Planning: Land and Rights Eskom Transmission Division	28/09/2022	Please send me a KMZ file of the affected properties and proposed grid connection. Please find attached Eskom requirements for work at or near Eskom infrastructure and servitudes, as well as an RE setbacks guideline.	CES replied 29/9/2022: "Please find attached the KML files of the affected properties for the Wind Energy Facilities." The grid connection is subject to a separate Basic Assessment process. The applicant is currently engaging with Eskom regarding the route alignment. KML files of the WEF were provided.

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
Megawatt Park, D1Y42, Maxwell Drive, Sunninghill, Sandton. P O Box 1091, Johannesburg, 2000.			
Mashudu Mudau BC Admin Department of Forestry, Fisheries, and the Environment	3/10/2022	DFFE Directorate: Biodiversity Conservation hereby acknowledge receipt of the invitation to review and comment on the project mentioned on the subject line. Kindly note that the project has been allocated to Mrs Makitla and Ms Mudau (Both copied on this email). Please note: All Public Participation Process documents related to Biodiversity EIA review and any other Biodiversity EIA queries will be submitted to the Directorate: Biodiversity Conservation at Email: BCAdmin@environment.gov.za for attention of Mr Seoka Lekota.	CES replied 5/10/2022: "Thank you, this email serves as confirmation that we have received your acknowledgement of receipt of the invitation to review and comment." All Public Participation Process documents related to Biodiversity EIA review and any other Biodiversity EIA queries will be submitted to the Directorate: Biodiversity Conservation at Email: BCAdmin@environment.gov.za for attention of Mr Seoka Lekota. We will also submit the documents to the updated BCAdmin@dffe.gov.za email address.
Millicent Solomons Acting Chief Director: Integrated Environmental Authorisations Department of Forestry, Fisheries and the Environment	20/10/2022	COMMENTS ON THE DRAFT SCOPING REPORT FOR THE PROPOSED SOYUZ 1 WIND ENERGY FACILITY, EMTHANJENI LOCAL MUNICIPALITY IN THE NORTHERN CAPE PROVINCE The Application for Environmental Authorisation and the Draft Scoping Report (SR) dated September 2022 and received by the Department on 20 September 2022, refers. This letter serves to inform you that the following information must be included to the Final Scoping Report: **(a) Specific Comments**	Thank you for your comments on the proposed Soyuz 1 WEF Draft Scoping Report. **(a) Specific Comments** (i) The project does not have SIP status yet and the application should therefore be treated as a normal EIA application. (ii) A concise and complete summary of the project description is provided in the Scoping Report on pages ii to iv.

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		(i) The applicant stipulates the project forms part of two Strategic Infrastructure Projects (SIPs) i.e., SIP 8: Green energy in support of the South African economy and SIP 9: Electricity generation to support socioeconomic development. It is mandatory to provide proof of confirmation for SIP applications from the relevant sector representative. Should no proof be provided, the application will be considered as a normal EIA Application. A letter of confirmation for SIP applications can be obtained from the following relevant sector representatives: • Alvino Wild Schutt-Prins: AlvinoW@idc.co.za/ Alvino@presidency.gov.za; or • Tshepo Chuene: TshepoCh@idc.co.za. (ii) Please provide a concise, but complete, summary and bullet list of the project description and associated infrastructure (or project scope). This must include a list of all development components and associated infrastructure. (iii) The layout plans overlaid by the sensitivities in a number of specialist's studies included in the Draft SR fails to illustrate all of the proposed infrastructure, for example, the layout plan included in the Avifaunal Assessment uses the same symbols to display the substation and laydown area, and does not illustrate the position of the BESS. The layout plans included in the Freshwater Assessment, Botanical Assessment and the Faunal Assessment do not illustrate the location of the BESS while the layout plan in the Bat Assessment depicts all the associated infrastructure as one symbol making it difficult to determine which specific infrastructure or activity would be located in which area. All	(iii) A **preliminary** layout map is included as Figure 2-1 in the Scoping Report (please note that the layout will be refined based on the outcome of the specialist studies in order to avoid and minimise impacts on sensitive areas). The **preliminary** positions of the proposed wind turbines, laydown areas, internal and external roads, substations and concrete batching plant are displayed on the map. The position of the BESS, gate house and security, operational and maintenance buildings have yet to be determined and will be informed by the outcome of the specialist assessments and EIA. (iv) Comments have been received from the Department's Biodiversity Conservation Directorate. Comments are included in the Comments and Response Report (this table) and original comments are included under Appendix D. **(b) Listed Activities** (i) The EAP confirms that all relevant listed activities are applied for, are specific and can be linked to the development activity or infrastructure as described in the project description. The listed activities are included in the Scoping Report under Section 2.3. (ii) The EAP confirms that the latest application form, dated April 2021, has been used and that the listed activities in the Scoping Report are the same as those in the Application Form.

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		layout plans utilized by the specialist's studies and overlaid by the identified sensitivities on the site, must be the same layout plan uniformly used by all specialists. Each activity/infrastructure needs to be clearly illustrated on the layout plans and assigned different symbols that can be clearly seen and identified. (iv) Comments must be obtained from this Department's Biodiversity Conservation Directorate at BCAdmin@dffe.gov.za. **(b) Listed Activities** (i) Please ensure that all relevant listed activities are applied for, are specific and can be linked to the development activity or infrastructure as described in the project description. (ii) If the activities applied for in the application form differ from those mentioned in the Final SR, an amended application form must be submitted. Please note that the Department's application form template has been amended and can be downloaded from the following link https://www.environment.gov.za/documents/forms. **(c) Layout & Sensitivity Maps** (i) The Final SR must provide coordinate points for the proposed development site (note that if the site has numerous bend points, at each bend point coordinates must be provided) as well as the start, middle and end point of all linear activities.	**(c) Layout & Sensitivity Maps** (i) Coordinate points, including all bend points, for the proposed development site, as well as the start, middle, and end points of all linear activities are included in the Scoping Report. Please see Table 2-4 and Figure 2-4 in Chapter 2 of this report for the coordinates for the site. (ii) All turbine positions are clearly numbered in the maps and consistently used in all maps in the report. This numbering will be maintained throughout the EIA Phase for ease of reference. (iii) A **preliminary** layout map is included as Figure 2-1 in the Scoping Report as described below (please note that the layout will be refined based on the outcome of the specialist studies in order to avoid and minimise impacts on sensitive areas): a) The **preliminary** positions of the proposed wind turbines, laydown areas, internal and external roads, substations and concrete batching plant are displayed on the map. The position of the BESS, gate house and security, operational and maintenance buildings have yet to be determined and will be informed by the outcome of the specialist assessments and EIA. b) A separate **preliminary** sensitivity map overlain by the proposed WEF and associated infrastructure as described in point (a) is included as Figure 7-10 in the Scoping Report; c) Supporting onsite infrastructure as described above in point (a) is **preliminarily** show in Figure 2-1;

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		(ii) All preferred turbine positions must be clearly numbered. The turbine position numbers must be consistently used in all maps to be included in the reports. (iii) Please provide a layout map which indicates the following: a) The proposed position of the wind turbines, laydown areas, internal and external roads, substations, BESS, gate house and security, operational and maintenance buildings and the concrete batching plant; b) The proposed WEF and associated infrastructure, overlain by the sensitivity map; c) All supporting onsite infrastructure e.g. roads (existing and proposed); d) The location of sensitive environmental features on site e.g. CBAs, heritage sites, wetlands, drainage lines etc. that will be affected; e) Buffer areas; and f) All "no-go" areas. (iv) The above map must be overlain with a sensitivity map and a cumulative map which shows neighbouring renewable energy developments and existing grid infrastructure. (v) Google maps will not be accepted. **(d) Alternatives** (i) Please provide a description of any identified alternatives for the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives will have on the	d & e) The location of **preliminary** sensitive environmental features and buffer areas on the site have been included as Figure 7-10 in the report; and f) No-go areas will be identified based on the results of the full impact assessments that from part of the EIR phase of the application. (iv) A cumulative map showing neighbouring renewable energy developments is included as Figure 9.1. (v) The EAP confirms that Google maps has not been used to create the maps for this application. **(d) Alternatives** (i) The EAP acknowledges the required process in terms of Alternatives. Please see Chapter 8 and Table 8.1 for a detailed description of Alternatives. (ii) A description of identified alternatives has been provided in Chapter 8 and Table 8.1. **(e) Public Participation Process** (i) The provincial Newspaper, Die Volksblad, does not publish advertisements in English. Therefore, the Afrikaans medium was the only medium available to use. (ii) The Public Participation Process is being conducted in terms of Regulation 39, 40 41, 42, 43 & 44 of the EIA Regulations 2014, as amended. Please kindly refer to the Comments and Response Report, appended to the Final

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		environment and on the community that may be affected by the activity as per Appendix 2 of GN R.982 of 2014 (as amended). (ii) Alternatively, you should submit written proof of an investigation and motivation if no reasonable or feasible alternatives exist in terms of Appendix 2. **(e) Public Participation Process** (i) Kindly provide reasons as to why the language selected for the newspaper advertisement (attached as Appendix C) is only Afrikaans. The EAP must ensure that the newspaper medium used must ensure that all potential I&AP's are adequately catered for in the study area. (ii) Please ensure that all issues raised and comments received during the circulation of the SR from registered I&APs and organs of state which have jurisdiction (including this Department's Biodiversity Section) in respect of the proposed activity are adequately addressed in the Final SR. Proof of correspondence with the various stakeholders must be included in the Final SR. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of Regulation 39, 40 41, 42, 43 & 44 of the EIA Regulations 2014, as amended. (iii) All issues raised and comments received during the circulation of the Draft SR from I&APs and organs of state which have jurisdiction in respect of the proposed activity	Scoping Report as Appendix D which includes all comments received on the Draft Scoping Report from I&APs and organs of state which have jurisdiction in respect of the proposed activity, including comments from DFFE EIA Application Directorate and DFFE Biodiversity Directorate. Comments have been addressed within the Final Scoping Report. Kindly refer to Chapter 10 (PPP process, inclusive of Stakeholder and I&AP database, Appendix C (PPP Proofs); and Appendix D (Comments and Response Report). (iii) Please kindly refer to the Comments and Response Report, appended to the Final Scoping Report as Appendix D which includes all comments received on the Draft Scoping Report from I&APs and organs of state which have jurisdiction in respect of the proposed activity, including comments from DFFE EIA Application Directorate and DFFE Biodiversity Directorate. Comments have been addressed within the Final Scoping Report. Kindly refer to Chapter 10 (PPP process, inclusive of Stakeholder and I&AP database, Appendix C (PPP Proofs); and Appendix D (Comments and Response Report). (iv) The Comments and Response Report is a separate document from the main report and is present a table format. Please kindly refer to the Comments and Response Report, appended to the Final Scoping Report as Appendix D. All comments from I&APs have been copied verbatim and responded to in detail.

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		are adequately addressed in the Final SR, including comments from this Department, and must be incorporated into a Comments and Response Report (CRR). (iv) The comments and response trail report (C&R) must be submitted with the Final SR. The C&R report must incorporate all comments for this development. The C&R report must be a separate document from the main report and the format must be in the table format as indicated in Annexure 1 of this comments letter. Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as "Noted" is not regarded as an adequate response to I&AP's comments. (v) Minutes and attendance registers (where applicable) of any physical/virtual meetings held by the Environmental Assessment Practitioner (EAP) with Interested and Affected Parties (I&APs) and other role players must be included in the Final SR. (vi) The Final SR must provide evidence that all identified and relevant competent authorities have been given an opportunity to comment on the proposed development. **(f) Specialist Assessments** (i) Specialist Declaration of Interest forms must be attached to the Final SR. The forms are available on Department's website (please use the Department's template).	(v) The minutes and attendance register for the Pre-Application Meeting held with DFFE are included under Appendix C (PPP Proofs). (vi) All proofs of PPP are available in Appendix C of this Report and the Comments and Response Report is available in Appendix D. **(f) Specialist Assessments** (i) Specialist Declaration of Interest forms have been attached to the Final Scoping Report under Appendix E. The Department's template has been used. (ii) Detailed specialist methodologies are provided under Chapter 10 of the Final Scoping Report and will also be included each specialist report. The specialists have assessed the preliminary layout of the proposed WEF project. The layout will be refined during the EIR phase of the project when the detailed specialist impact assessments are undertaken. (iii) The EAP confirms that the detailed specialist impact assessments will provide a detailed description of all limitations associated with the studies. All specialist studies will be conducted in the correct season where applicable. (iv) The EAP acknowledges that in the event that specialists specify contradicting recommendations, the EAP will clearly indicate the most reasonable

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		(ii) Specialist studies to be conducted must provide a detailed description of their methodology, as well as indicate the locations and descriptions of turbine positions, and all other associated infrastructures that they have assessed and are recommending for authorisations. (iii) The specialist studies must also provide a detailed description of all limitations to their studies. All specialist studies must be conducted in the right season and providing that as a limitation, will not be accepted. (iv) Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons; and were necessary, include further expertise advice. (v) It is further brought to your attention that Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols"), and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. Please note that specialist assessments must be conducted in accordance with these protocols. (vi) As such, the Specialist Declaration of Interest forms must also indicate the scientific organisation	recommendation and substantiate this. Further expert advice will be obtained should the EAP deem this fit. (v) The EAP confirms that specialist assessments will be conducted in accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols"), and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species). (vi) The Specialist Declaration of Interest forms included under Appendix E of the Scoping Report indicate the scientific organisation registration/member number and status of registration/membership of the specialist. (vii) The Final Scoping Report includes the Site Verification Report compiled in terms of the protocols (see Chapter 7 of the Final Scoping Report) as required by the relevant environmental themes and assessments. (viii) The EAP confirms that the relevant specialist SACNASP certificates will be attached to the relevant specialist reports. (ix) The required specialist studies are presented in Table 7.1 in the Final Scoping Report, which provides the site sensitivity verification and indicates the specialist studies to be undertaken and describes the approach. Several

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		registration/member number and status of registration/membership for each specialist. (vii) Please also ensure that the Final SR includes the Site Verification Report as required by the relevant environmental themes and assessments. (viii) Please note further that the protocols, if applicable, require certain specialists' to be SACNASP registered. Please ensure that the relevant specialist certificates are attached to the relevant reports. (ix) We note that the screening tool indicates that seventeen specialist studies need to be undertaken or conducted. We note that the SR does not include seventeen specialist reports. Please kindly peruse the protocols and provide in the SR site sensitivity reports for each theme/study listed, as well as compliance statements for assessments not needed to be conducted based on your site sensitivity verification. For ease of reference, Part A of the protocols is omitted from the SR. **(g) Cumulative Assessment** (i) Should there be any other similar projects within a 30km radius of the proposed development site, the cumulative impact assessment for all identified and assessed impacts must be refined to indicate the following: a) Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be	specialist studies are being combined, namely the Visual Specialist Study includes an landscape and flicker assessment, the Faunal Specialist Study includes the terrestrial biodiversity and animal species assessments, and the Botanical Specialist Study includes the terrestrial biodiversity and plant species assessments. The relative civil aviation and defence themes have been confirmed to be of low sensitivity; therefore, no further assessment is required. As agreed during the pre-application meeting with DFFE, SKA/SARAO will be registered as a stakeholder and will be invited to participate in the PPP. Should an RFI study be required, this can be commissioned during the EIR phase. **(g) Cumulative Assessment** (i) The proposed assessment of cumulative impacts is discussed under Section 9.4 of the Final Scoping Report. A map showing similar projects within a 30km radius of the proposed development site has been included as Figure 9.1. During the EIR phase, the cumulative impact assessment for all identified and assessed impacts will be refined and will indicate the following: a) Identified cumulative impacts will be defined, and where possible the size of the impact will be quantified and indicated. b) The process flow to be followed is included under Section 9.4 of the Final Scoping Report

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		quantified and indicated, i.e. hectares of cumulatively transformed land. b) Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project. c) The cumulative impacts significance rating must also inform the need and desirability of the proposed development. d) A cumulative impact environmental statement on whether the proposed development must proceed. **General** You are further reminded to comply with Regulation 21(1) of the NEMA EIA Regulations 2014, as amended, which states that: "If S&EIR must be applied to an application, the applicant must, within 44 days of receipt of the application by the competent authority, submit to the competent authority a scoping report which has been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority" You are further reminded that the Final SR to be submitted to this Department must comply with all the requirements in terms of the scope of assessment and content of Scoping	c) The cumulative impacts significance rating will be provided to inform the need and desirability of the proposed development. d) A cumulative impact environmental statement will be provided on whether the proposed development must proceed. **General** The EAP confirms that the application complies with Regulation 21(1) of the NEMA EIA Regulations 2014, as amended. The Final Scoping Report, which includes a 30-day public review period, has been submitted within 44 days of receipt of the application. The report includes all comments received. The EAP confirms that the Final Scoping report complies with the scope of assessment and content of Scoping reports in accordance with Appendix 2 and Regulation 21(1) of the EIA Regulations 2014, as amended. The EAP acknowledges that this application will lapse if the applicant fails to meet any of the timeframes prescribed in terms of these Regulations unless an extension has been granted in terms of Regulation 3(7). The EAP acknowledges that no activity may commence prior to an Environmental Authorisation being granted by the Department. **Annexure 1**

<table>
<tr><th>STAKEHOLDER AND I&AP DETAILS</th><th>DATE RECEIVED</th><th>STAKEHOLDER OR I&AP COMMENT</th><th>EAP/APPLICANT RESPONSE</th></tr>
<tr><td></td><td></td><td>reports in accordance with Appendix 2 and Regulation 21(1) of the EIA Regulations 2014, as amended.

Further note that in terms of Regulation 45 of the EIA Regulations 2014, as amended, this application will lapse if the applicant fails to meet any of the timeframes prescribed in terms of these Regulations, unless an extension has been granted in terms of Regulation 3(7).
You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an Environmental Authorisation being granted by the Department.

Annexure 1
<table>
<tr><td>Format for Comments and Response Report: Date of comment, format of comment name of organisation/I&AP</td><td>Comment</td><td>Response from EAP/Applicant/ Specialist</td></tr>
<tr><td>27/03/2021

Email

Department of Forestry, Fisheries, and the Environment: Priority</td><td>Please record C&R trail report in this format.

Please update the contact details of the provincial</td><td>EAP: (Noted)The C&R trail report has been updated into the desired format, see Appendix K.

EAP: Details of provincial</td></tr>
</table></td><td>The comments and response report (this table) has been presented in the table format required by the CA.</td></tr>
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STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		Infrastructure Projects (Joe Soap) | environmental authority. | authority have been updated, see page 16 of the Application form.	
Seoka Lekota Biodiversity Control Officer Grade B Department of Forestry, Fisheries, and the Environment	21/10/2022	COMMENTS ON THE DRAFT SCOPING REPORT FOR THE DEVELOPMENT OF THE PROPOSED SOYUZ WEF COMPLEX NEAR BRITSTOWN WITHIN EMTHANJENI AND UBUNTU LOCAL MUNICIPALITIES, NORTHERN CAPE PROVINCE The Directorate: Biodiversity Conservation has reviewed and evaluated the report and does not have any objections to the Draft Scoping Report & Plan of Study. However, according to the Northern Cape Critical Biodiversity Area Map (2016) maps biodiversity priority areas, including Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), and Other Natural Areas (ONAs) require safeguarding to ensure the persistence of biodiversity and ecosystem functioning, through a systemic conservation planning process. It is therefore that infrastructure is placed in such a way to avoid any highly sensitive biodiversity areas and where avoidance is not possible, minimise the footprint, to reduce the impact of the project. NB: The Public Participation Process document related to Biodiversity EIA for review and queries should be submitted to the Directorate: Biodiversity Conservation at Email; BCAdmin@environment.gov.za for attention of Mr. Seoka Lekota.	Thank you for your comments on the Soyuz WEFs Draft Scoping Reports. The EAP acknowledges that you have no objections. The aim of the EIA and associated specialist studies is to ensure that infrastructure is not placed in such a way that will detrimentally affect highly sensitive biodiversity areas. The presence of No-Go and sensitive areas will inform the project layout to ensure that the impact of the project is as low as possible. The EAP confirms that all Public Participation Process documents related to the project will be submitted to the Directorate: Biodiversity Conservation at Email; BCAdmin@environment.gov.za/BCAdmin@dffe.gov.za for attention of Mr. Seoka Lekota.

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
Natasha Higgitt nhiggitt@sahra.org.za 021 462 4502 Heritage Officer South African Resource Agency (SAHRA) Philip Hine Manager: Archaeology, Palaeontology and Meteorites Unit SAHRA	21/10/2022	In terms of Section 38(3), 38(8) of the National Heritage Resources Act (Act 25 of 1999) Attention: Soyuz 1 (Pty) Ltd 14th Floor Pier Place, Heerengracht Street, Foreshore, Cape Town, 8001 The Applicant, Soyuz 1 (Pty) Ltd., is proposing the development of a commercial Wind Energy Facility (WEF) and associated infrastructure on a site located approximately 22 km South of Britstown within the Emthanjeni Local Municipality and the Pixley ka Seme District Municipality in the Northern Cape Province. CES Environmental and Social Advisory Services has been appointed by Soyuz 1 (Pty) Ltd to conduct an Environmental Authorisation (EA) Application for the proposed Soyuz 1 Wind Energy Facility, near Britstown, Northern Cape Province. A draft Scoping Report (DSR) has been submitted in terms of the National Environmental Management Act, 1998 (NEMA) and the 2017 NEMA Environmental Impact Assessment (EIA) Regulations. The proposed development will include the construction of up to 75 turbines, transformer at the base of each turbine, concrete turbine foundation, turbine, crane and blade hardstands, temporary laydown areas, battery energy storage system (BESS), cabling between turbines (underground where practical), two on-site substations, access roads to the site and between project components inclusive of storm water	Thank you for your comments on the Soyuz 1 WEF Draft Scoping Report. **Interim Comment** The EAP confirms that the pending assessment of the impact to heritage and palaeontological resources will comply with section 38(3) of the NHRA, the 2007 SAHRA Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment and the 2012 Minimum Standards: Palaeontological Component of Heritage Impact Assessments. The HIA will include the results of the VIA. We look forward to receiving further comments from you once you have reviewed the draft EIA inclusive of appendices.

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		infrastructure (125 km), a temporary site camp establishment and concrete batching plants, operation and maintenance buildings, within an application area of 16 200 ha. Banzai Environmental (Pty) Ltd and Exigo Sustainability were appointed to provide heritage specialist input into the EA process as required by section 24(4)b(iii) of NEMA and section 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA). *Butler, E. 2022. Palaeontological Desktop Assessment: Soyuz 1 Wind Energy Facility Northern Cape Province.* The proposed development area is underlain by Late Caenozoic alluvium, Tertiary-Quaternary calcrete, Jurassic Karoo Dolerite, and the Ecca Group, which is highly sensitive. The report recommends that a site investigation of the proposed development area be conducted during the EIA phase. *Nelius, K. 2022. Heritage Scoping Study: Soyuz 1 (Pty) Ltd: Soyuz 1 Wind Energy Facility Project, Pixley Ka Seme District Municipality, Northern Cape Province* The desktop assessment states that heritage resources such as Stone Age sites, engravings, historical farmsteads and structures, remains of the Anglo-Boer War, cemeteries and burial grounds, and intangible heritage may be present in the proposed development area.	

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		Recommendations provided in the report include the following: • 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; • 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. **Interim Comment** The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit requests that the pending assessment of the impact to heritage and palaeontological resources comply	

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		with section 38(3) of the NHRA, the 2007 SAHRA Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment and the 2012 Minimum Standards: Palaeontological Component of Heritage Impact Assessments. The HIA must include the results of the VIA. Further comments will be issued upon receipt of the above pending reports and the draft EIA inclusive of appendices.	
COMMENTS SUBMITTED AFTER FINAL SCOPING REPORT			
STAKEHOLDER AND I&AP DETAILS	**DATE RECEIVED**	**STAKEHOLDER OR I&AP COMMENT**	**EAP/APPLICANT RESPONSE**
Portia Makitla DFFE Control Biodiversity Officer: Biodiversity Mainstreaming & EIA	7/11/2022	DFFE Directorate: Biodiversity Conservation hereby acknowledge receipt of the invitation to review and comment on the project mentioned on the subject line. Kindly note that the project has been allocated to Mrs P Makitla and Ms M Mudau (Both copied on this email). Please note: All Public Participation Process documents related to Biodiversity EIA review and any other biodiversity EIA queries will be submitted to the Directorate: Biodiversity Conservation at Email: BCAdmin@environment.gov.za for attention of Mr Seoka Lekota	All correspondence regarding the Public Participation Process for the Soyuz WEF cluster have and will continue to be submitted the DFFE Biodiversity Conservation Directorate and marked for attention of Mr Seoka Lekota as well as Mrs P Makitla and Ms M Mudau. It is noted that we have also sent the correspondence to the BCAdmin@dffe.gov.za email address, as this is the correct email address.
John Geerigh Eskom	07/11/2022	Do these projects have reference numbers yet?	CES replied 7/11/2022: "Yes, they do each have a DFFE reference number as follows: Soyuz 1 WEF: **14/12/16/3/3/2/2205** Soyuz 2 WEF: **14/12/16/3/3/2/2206** Soyuz 3 WEF: **14/12/16/3/3/2/2207** Soyuz 4 WEF: **14/12/16/3/3/2/2208** Soyuz 5 WEF: **14/12/16/3/3/2/2209**

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
			Soyuz 6 WEF: **14/12/16/3/3/2/2210** An electronic copy of the Final Scoping Reports with that information can also be downloaded from the CES website at: http://www.cesnet.co.za/public-documents".
Martin Zeekoei I&AP	1/12/2022	Thank you for the information.	The comment has been recorded.
Mashienyane Portia Makitla DFFE Control Biodiversity Officer: Biodiversity Mainstreaming & EIA And Seoka Lekota Control Biodiversity Officer Grade B: Biodivseristy Conservation Department of Forestry, Fisheries and the Environment	06/12/2022	Kindly find the attached comments for your consideration. **COMMENTS ON THE FINAL SCOPING REPORTS FOR THE DEVELOPMENT OF THE PROPOSED SOYUZ WEF COMPLEX NEAR BRITSTOWN WITHIN EMTHANJENI AND UBUNTU LOCAL MUNICIPALITIES, NORTHERN CAPE PROVINCE** The Directorate: Biodiversity Conservation has reviewed and evaluated the report and does not have any objections to the Draft Scoping Report & Plan of Study. The Northern Cape Critical Biodiversity Area Map (2016) classified the Critical Biodiversity Areas (CBAs) as areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan. Ecological Support Areas (ESAs) 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 proposed development might impact on biodiversity important areas, kindly prioritise positioning the development infrastructures in areas of low ecological importance and ensure that all activities within a sensitive	All correspondence regarding the Public Participation Process for the Soyuz WEF cluster have and will continue to be submitted the DFFE Biodiversity Conservation Directorate and marked for attention of Mr Seoka Lekota as well as Mrs P Makitla and Ms M Mudau. It is noted that we have also sent the correspondence to the BCAdmin@dffe.gov.za email address, as this is the correct email address. The specialist studies undertaken during the EIA, including the terrestrial biodiversity studies, have informed the layout of the proposed WEF. The WEF infrastructure thus avoids. sensitive areas as far as possible. A detailed sensitivity analysis together with a layout map superimposed on an environmental sensitivity map is included under Section 10 of this report. Wetlands, rivers and riparian areas have been demarcated as no-go areas except where access roads over these areas are required. The freshwater specialist study includes a detailed impact assessment on these features and recommends mitigation measures for minimizing potential impacts.

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		area that will result with significant negative residual impacts after mitigation are prohibited. Furthermore, the following recommendations must be considered in the final report. • A map combining the final layout map superimposed (overlain) on the environmental sensitivity map. This map must reflect the proposed location of the turbines • Wetlands, rivers and rivers riparian areas must be treated as "no-go" areas and appropriately demarcated as such • Develop and implement bat/avifauna monitoring program to determine the actual impacts on the bat community • The pre-construction monitoring programme must be designed in accordance with the latest version of the "Best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development areas in southern Africa" • Develop and submit an Alien Invasive Plant Species Management as part of the final report to mitigate on alien plant invasion • Develop an Erosion Management Plan, Maintenance Plan and Rehabilitation Plan of natural vegetation to mitigate on habitat degradation and consider all phases of the development; and • Rehabilitation Plan must include the ongoing monitoring and maintenance of the surrounding natural vegetation. • NB: The Public Participation Process documents related to Biodiversity EIA for review and queries should be submitted to the Directorate: Biodiversity Conservation	At bat/avifauna monitoring programme will be developed and implemented for the construction and operational phases of the WEF. Alien invasive plant, erosion, maintenance and rehabilitation management plans will form part of the final EMPr submitted to DFFE for approval.

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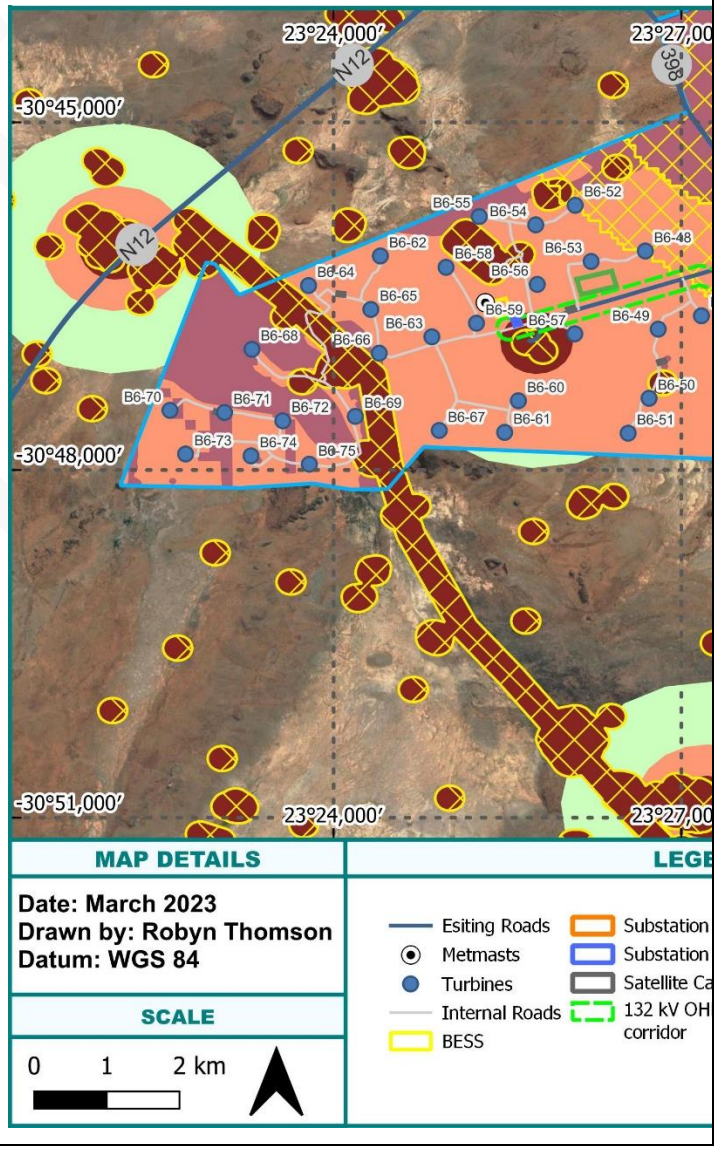
		at Email; BCAdmin@environment.gov.za for attention of Mr. Seoka Lekota.	
Milicent Solomons Acting Chief Director: Integrated Environmental Authorisations DFFE (Signed by Coenrad Agenbach)	07/12/2022	**ACCEPTANCE OF THE SCOPING REPORT FOR THE SOYUZ 1 WIND ENERGY FACILITY IN THE EMTHANJENI MUNICIPALITY IN THE NORTHERN CAPE PROVINCE** The final Scoping Report (SR) and the Plan of Study for Environmental Impact Assessment dated November 2022 and received by the Department on 02 November 2022, refer. The Department has evaluated the submitted final SR and the Plan of Study for Environmental Impact Assessment dated November 2022 and is satisfied that the documents comply with the minimum requirements of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended. The final SR is hereby accepted by the Department in terms of Regulation 22(1)(a) of the EIA Regulations, 2014, as amended. You may proceed with the environmental impact assessment process in accordance with the tasks contemplated in the Plan of Study for Environmental Impact Assessment as required in terms of the EIA Regulations, 2014, as amended. In addition, the following amendments and additional information are required for the EIAR: **(a) Listed Activities**	**Listed Activities** The EIAr provides an assessment of the impacts and mitigation measures for each of the listed activities applied for. The listed activities represented in the EIAr and the application form are the same and correct. The EIAr assesss the correct sub listed activity for each listed activity applied for. **Public Participation** A second advert in English has been placed in the newspaper to coincide with the availability of the Draft EIR. Proof will be included in the Final EIR. All relevant stakeholders have been included on the I&AP and stakeholder database for the WEF. This includes the Northern Cape Department: Agriculture, Environment Affairs, Rural Development and Land Reform, the Emthanjeni Local Municipality, the Pixley Ka Seme District Municipality, the Department of Water and Sanitation (DWS), the South African Heritage Resources Agency (SAHRA), the Endangered Wildlife Trust (EWT), BirdLife SA, the Department of Mineral Resources, and the Department of Environment, Forestry and Fisheries: Directorate Biodiversity and Conservation. All comments received from stakeholders will be submitted to the DFFE with the Final EIR.

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		(i) The EIAr must provide an assessment of the impacts and mitigation measures for each of the listed activities applied for. (ii) The listed activities represented in the EIAr and the application form must be the same and correct. (iii) The EIAr must assess the correct sub listed activity for each listed activity applied for. **(b) Public Participation** (i) Please ensure the language used to inform potential I&APs in the newspaper advertisement is not only communicated in the language Afrikaans but should also utilise other dominant languages spoken in the study area. The EAP must ensure that the newspaper medium adequately caters for all potential I&APs in the study area. (ii) Please ensure that comments from all relevant stakeholders are submitted to the Department with the EIAr. This includes but is not limited to the Northern Cape Department: Agriculture, Environment Affairs, Rural Development and Land Reform, the Emthanjeni Local Municipality, the Pixley Ka Seme District Municipality, the Department of Water and Sanitation (DWS), the South African Heritage Resources Agency (SAHRA), the Endangered Wildlife Trust (EWT), BirdLife SA, the Department of Mineral Resources, and the Department of Environment, Forestry and Fisheries: Directorate Biodiversity and Conservation.	All issues raised, and comments received during the circulation of the draft SR and draft EIAr from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity will be adequately addressed in the final EIR. Proof of correspondence with the various stakeholders will be included in the final EIR. Proof will be submitted to the DFFE of the attempts made to obtain comments. A Comments and Response trail report (C&R) will be submitted with the final EIR. The C&R report will incorporate all comments for this development. The C&R report will be a separate document from the main report and in a table format. Comments from I&APs will be transcribed verbatim and responded to clearly. Comments from I&APs will not be split and arranged into categories. Comments from each submission will be responded to individually. The Public Participation Process is being conducted in terms of Regulation 39, 40, 41, 42, 43 and 44 of the EIA Regulations, 2014, as amended. **(c) Layout & Sensitivity Maps** The EIAr must provides coordinate points for the proposed development site and all proposed infrastructure. Coordinates are listed in Table 2-4, Table 2-5 and Table 9-3. All turbine positions are clearly numbered. The turbine position numbers have been consistently used in all maps in the reports.

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		(iii) Please ensure that all issues raised, and comments received during the circulation of the draft SR and draft EIAr from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the final EIAr. Proof of correspondence with the various stakeholders must be included in the final EIAr. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments. (iv) A Comments and Response trail report (C&R) must be submitted with the final EIAr. The C&R report must incorporate all comments for this development. The C&R report must be a separate document from the main report and the format must be in the table format as indicated in Appendix 1 of this comments letter. Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as "noted" is not regarded as an adequate response to I&AP's comments. (v) Comments from I&APs must not be split and arranged into categories. Comments from each submission must be responded to individually. (vi) The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 and 44 of the EIA Regulations, 2014, as amended. **(c) Layout & Sensitivity Maps**	A final preferred layout map is included as Figure 2-1. All available biodiversity information has been used in the finalisation of the layout map. Existing infrastructure will be used as far as possible e.g., roads. The layout map indicates the following: • The proposed wind energy facility boundary • Position of the wind turbines • Powerlines • Internal roads • All supporting onsite infrastructure such as laydown area, guard house and control room • Substations, transformers, switching stations and inverters • Battery Energy Storage System • The location of sensitive environmental features on site, including CBAs, heritage sites, wetlands, drainage lines. that will be affected by the facilities and its associated infrastructure • Connection routes to the distribution/transmission network. Note that pylon positions will depend on the outcome of the micro siting exercise to take place prior to finalization of the EMPr • All existing infrastructure on the site, especially railway lines and roads • Buildings, including accommodation.

		(i) The EIAr must provide coordinate points for the proposed development site and all proposed infrastructure (note that if the site has numerous bend points, at each bend point coordinates must be provided) as well as the start, middle and end point of all linear activities. (ii) All preferred turbine positions must be clearly numbered. The turbine position numbers must be consistently used in all maps to be included in the reports. (iii) The EIAr must provide a copy of the final preferred layout map. All available biodiversity information must be used in the finalisation of the layout map. Existing infrastructure must be used as far as possible e.g., roads. The layout map must indicate the following: a) A clear indication of the envisioned area for the proposed wind energy facility; b) Position of the wind turbines; c) Powerlines; d) Internal roads; e) All supporting onsite infrastructure such as laydown area, guard house and control room etc.; f) Substations, transformers, switching stations and inverters; g) Battery Energy Storage System; h) The location of sensitive environmental features on site e.g. CBAs, heritage sites, wetlands, drainage lines etc. that will be affected by the facilities and its associated infrastructure;	An environmental sensitivity map indicating the following is shown as 

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		i) Connection routes (including pylon positions) to the distribution/transmission network; j) All existing infrastructure on the site, especially railway lines and roads; and k) Buildings, including accommodation. (iv) Please provide an environmental sensitivity map which indicates the following: a) The location of sensitive environmental features identified on site, e.g. CBAs, protected areas, heritage sites, wetlands, drainage lines etc. that will be affected by the facility and its associated infrastructure; b) Buffer areas; and c) All "no-go" areas. (v) The above layout map must be superimposed (overlain) with the sensitivity map and a cumulative map which shows neighbouring and existing infrastructure. (vi) Google maps will not be accepted. **(d) Specialist assessments** (i) The EAP must ensure that the terms of reference for all the identified specialist studies must include the following: a) A detailed description of the study's methodology;	Figure 10-1: • The location of sensitive environmental features identified on site, e.g. CBAs, protected areas, heritage sites, wetlands, drainage lines etc. that will be affected by the facility and its associated infrastructure • Buffer areas • All "no-go" areas The above layout map has been superimposed (overlain) with the sensitivity map. A cumulative map which shows neighbouring and existing infrastructure has also been provided. Google maps has not been used to create these maps. **Specialist assessments** The identified specialist studies all include the following: • A detailed description of the study's methodology; indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisation. • Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season and providing that as a limitation will not be allowed. • 'No-go' areas are presented as areas where no development of any infrastructure is allowed. • In areas where 'no-go' relates to only certain infrastructure, this has been clearly indicated. The specialists have indicated the 'no-go' area buffers where applicable.

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisation. b) Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season and providing that as a limitation will not be allowed. c) Please note that the Department considers a 'no-go' area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the 'no-go' areas. d) Should the specialist definition of 'no-go' area differ from the Department's definition; this must be clearly indicated. The specialist must also indicate the 'no-go' area's buffer if applicable. e) **All specialist studies must be final, and provide detailed/practical mitigation measures for the preferred alternative and recommendations, and must not recommend further studies to be completed post EA.** f) **Bird and bat specialist studies must have support from Birdlife South Africa and SABAA.** g) Should a specialist recommend specific mitigation measures, these must be clearly indicated.	▲ All specialist studies forming part of the final EIR will be final, and will provide detailed/practical mitigation measures for the preferred alternative and recommendations, and do not recommend further studies to be completed post EA. ▲ Birdlife South Africa and SABAA will be engaged to comment on the Draft EIR. ▲ Specific specialist mitigation measures, these must be clearly indicated. The appointed specialists have not specified contradicting recommendations. The specialists have used the Procedures for the Assessment and Minimum Criteria for Reporting in identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols") and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. Specialist assessments have been conducted in accordance with these protocols. A site verification report was included in the Scoping Reports submitted to the DFFE during the Scoping Phase. SACNASP registered specialists have conducted the specialist studies. Certificates have been included in the EIR. Specialist Declaration of Interest forms indicate the scientific organisation registration/member number and status of registration/membership for each specialist and are included under Appendix F of the Draft EIR (this report). The following Specialist Assessments form part of the EIR:

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<tr><th>STAKEHOLDER AND I&AP DETAILS</th><th>DATE RECEIVED</th><th>STAKEHOLDER OR I&AP COMMENT</th><th>EAP/APPLICANT RESPONSE</th></tr>
<tr><td></td><td></td><td>(ii) Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons; and were necessary, include further expertise advice.
(iii) It is further brought to your attention that Procedures for the Assessment and Minimum Criteria for Reporting in identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. “the Protocols”) and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. Please note that specialist assessments must be conducted in accordance with these protocols.
(iv) Please also ensure that the EIAr includes the Site Verification Report and Compliance Statements (where applicable) as required by the relevant themes.
(v) Please note further that the protocols, if applicable, require certain specialists’ to be SACNASP registered. Please ensure that the relevant specialist certificates are attached to the relevant reports.</td><td>
<table>
<tr><th>Specialist Study</th><th>Company</th></tr>
<tr><td>Agricultural Impact Assessment</td><td>TerraAfrica</td></tr>
<tr><td>Avifaunal Monitoring and Impact Assessment</td><td>Arcus Consultancy Service South Africa</td></tr>
<tr><td>Bat Monitoring and Impact Assessment</td><td>Arcus Consultancy Service South Africa</td></tr>
<tr><td>Botanical Impact Assessment</td><td>Biodiversity Africa</td></tr>
<tr><td>Faunal Impact Assessment</td><td>Biodiversity Africa</td></tr>
<tr><td>Freshwater Impact Assessment</td><td>Verdant Environmental</td></tr>
<tr><td>Heritage Impact Assessment</td><td>CES</td></tr>
<tr><td>Noise Impact Assessment</td><td>Environmental Acoustic Research</td></tr>
<tr><td>Paleontological Impact Assessment</td><td>Banzai Environmental</td></tr>
<tr><td>Socio-economic Impact Assessment</td><td>CES</td></tr>
<tr><td>Traffic Impact Assessment</td><td>JG Afrika</td></tr>
<tr><td>Visual Impact Assessment</td><td>NuLeaf Planning and Environmental</td></tr>
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Cumulative Assessment
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<td>(vi) As such, the Specialist Declaration of Interest forms must also indicate the scientific organisation registration/member number and status of registration/membership for each specialist.
(vii) The following Specialist Assessments will form part of the EIAr:

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<tr><td>Paleontological Impact Assessment</td><td>Banzai Environmental</td></tr>
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</td>
<td>A cumulative impact assessment for all identified and assessed impacts has been undertaken and includes the following:

- Identified cumulative impacts are clearly defined, and where possible the size of the identified impact has be quantified and indicated.
- The process flow has been provided, indicating how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.
- The cumulative impacts significance rating has informed the need and desirability of the proposed development.
- A cumulative impact environmental statement on whether the proposed development must proceed has been provided under Section 9.4.2.

General

All turbines located in the "not preferred" and "no-go" areas have been relocated based on the identification of sensitive areas by specialists.

The EIR provides the technical details for the proposed facilities in a table format as well as their description and/or dimensions.

Landowner consent for all farm portions affected by the proposed project were provided with the application forms submitted at the commencement of the S&EIR process.</td>
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<tr><td>Visual Impact Assessment</td><td>NuLeaf Planning and Environmental</td></tr>
</table>
(e) Cumulative Assessment
(i) Should there be any similar projects within a 30km radius of the proposed development site, the cumulative impact assessment for all identified and assessed impacts must be refined to indicate the following:
a) Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be quantified and indicated, i.e. hectares of cumulatively transformed land.
b) Detailed process flow and proof must be provided, to indicate how the specialist’s recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.
c) The cumulative impacts significance rating must also inform the need and desirability of the proposed development.
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<td>
A construction and operational phase EMPr that includes mitigation and monitoring measures has been submitted with the EIR, including the Generic EMPrs for the substations and powerlines.
The S&EIR process is compliant with the requirements of Regulation 45 of GN R982 of 04 December 2014, as amendment, with regard to the time period allowed for complying with the requirements of the Regulations.
The applicant acknowledges Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an environmental authorisation being granted by the Department.
</td>
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</table>

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		a) A cumulative impact environmental statement on whether the proposed development must proceed. **(f) General** (i) All turbines located in the "not preferred" and "no-go" areas must be relocated or removed from the development. (ii) The EIAr must provide the technical details for the proposed facilities in a table format as well as their description and/or dimensions. A sample for the minimum information required is listed under Annexure 2 below. (iii) The EAP must provide landowner consent for all farm portions affected by the proposed project i.e., all farm portions where non – linear infrastructure are to be located. (iv) A construction and operational phase EMPr that includes mitigation and monitoring measures must be submitted with the final EIAr, including the Generic EMPrs for substations and powerlines. The applicant is hereby reminded to comply with the requirements of Regulation 45 of GN R982 of 04 December 2014, as amendment, with regard to the time period allowed for complying with the requirements of the Regulations.	

STAKEHOLDER AND I&AP DETAILS	DATE RECEIVED	STAKEHOLDER OR I&AP COMMENT	EAP/APPLICANT RESPONSE
		You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an environmental authorisation being granted by the Department.	

17 APPENDIX E | SPECIALIST STUDIES

17.1 APPENDIX E1 – AGRICULTURAL IMPACT ASSESSMENT

17.2 APPENDIX E 2 – AVIFAUNAL MONITORING AND IMPACT ASSESSMENT

17.3 APPENDIX E3 – BAT MONITORING AND IMPACT ASSESSMENT

17.4 APPENDIX E4 – BOTANICAL IMPACT ASSESSMENT

17.5 APPENDIX E5 – FAUNAL IMPACT ASSESSMENT

17.6 APPENDIX E6 – FRESHWATER IMPACT ASSESSMENT

17.7 APPENDIX E7 – HERITAGE IMPACT ASSESSMENT

17.8 APPENDIX E8 – NOISE IMPACT ASSESSMENT

17.9 APPENDIX E9 – PALEONTOLOGICAL IMPACT ASSESSMENT

17.10 APPENDIX E10 – SOCIO-ECONOMIC IMPACT ASSESSMENT

17.11 APPENDIX E11 – TRAFFIC IMPACT ASSESSMENT

17.12 APPENDIX E12 – VISUAL IMPACT ASSESSMENT

18 APPENDIX F | SPECIALIST DECLARATIONS

PLEASE FIND THE SPECIALIST DECLARATIONS HERE WITHIN

18.1 APPENDIX F1 – AGRICULTURAL DECLARATION

18.2 APPENDIX F2 – AVIFAUNAL DECLARATION

18.3 APPENDIX F3 – BAT DECLARATION

18.4 APPENDIX F4 – BOTANICAL DECLARATION

18.5 APPENDIX F5 – FAUNAL DECLARATION

18.6 APPENDIX F6 – FRESHWATER DECLARATION

18.7 APPENDIX F7 – HERITAGE DECLARATION

18.8 APPENDIX F8 – NOISE DECLARATION

18.9 APPENDIX F9 – PALEONTOLOGICAL DECLARATION

18.10 APPENDIX F10 – SOCIO-ECONOMIC DECLARATION

18.11 APPENDIX F11 – TRAFFIC DECLARATION

18.12 APPENDIX F12 – VISUAL DECLARATION

19 APPENDIX G | ENVIRONMENTAL MANAGEMENT PROGRAMMES (EMPRS)

PLEASE FIND THE ENVIRONMENTAL MANAGEMENT PROGRAMMES HERE WITHIN

19.1 APPENDIX 4 EMPR (GENERAL WEF SITE)

19.2 GENERIC EMPR (SUBSTATIONS)

19.3 GENERIC EMPR (POWERLINES)

20 APPENDIX H | FULL IMPACTS TABLES

PLEASE FIND THE FULL IMPACT TABLES HERE WITHIN

20.1 GENERAL IMPACTS TABLE

20.2 SPECIALIST IMPACTS TABLE

21 APPENDIX I | IFC PERFORMANCE STANDARDS COMPLIANCE

PLEASE FIND THE IFC PERFORMANCE STANDARDS COMPLIANCE HERE WITHIN

21.1 IFC PERFORMANCE STANDARDS

OBJECTIVE	COMPLIANCE STATUS	RESPONSE	REFERENCE
PERFORMANCE STANDARD 1 – ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS			
▲ To identify and evaluate environmental and social risks and impacts of the project. ▲ To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, affected communities, and the environment. ▲ To promote improved environmental and social performance of clients through the effective use of management systems. ▲ To ensure that grievances from affected communities and external communications from other stakeholders are responded to and managed appropriately. ▲ To promote and provide means for adequate engagement with affected communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.	**YES**	A comprehensive EIA process is being conducted for the project in accordance with the National Environmental Management Act (No. 107 of 1998) (NEMA) and the 2014 EIA Regulations which will determine whether the project will be suitable from an environmental and social risk perspective. The NEMA EIA process aims to provide for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state. The process which has been undertaken for the Soyuz WEF cluster is underpinned by environmental, social and economic balance and public consultation. The result of this process, as evident in this EIR, was to apply the mitigation hierarchy to the site and to ensure that the public is fully aware of the environmental and social risks associated with the proposed cluster. The EIA process, inclusive of stakeholder and interested and affected party document disclosure, addresses IFC Performance Standard 1.	This EIA Report, with particular reference to Chapter 9, Chapter 10, Chapter 11 and Chapter 12. And Appendix C.
PERFORMANCE STANDARD 2 – LABOUR AND WORKING CONDITIONS			

OBJECTIVE	COMPLIANCE STATUS	RESPONSE	REFERENCE
▲ To promote the fair treatment, non-discrimination, and equal opportunity of workers. ▲ To establish, maintain, and improve the worker-management relationship. ▲ To promote compliance with national employment and labour laws. ▲ To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain. ▲ To promote safe and healthy working conditions, and the health of workers. ▲ To avoid the use of forced labour.	**YES**	South African Labour and Working Conditions Legislation is aligned with the WLO requirements which has been considered during the EIA process. The EIA process for the proposed Soyuz WEF cluster includes a detailed Socio-economic Impact Assessment. The Socio-economic Impact Assessment includes key principles and management outcomes to mitigate negative social impacts associated with labour and working conditions, and to enhance social benefits associated with the development. The Socio-economic Impact Assessment addresses IFC Performance Standard 2.	Appendix E, Socio-Economic Impact Assessment, the EIA Report and the EMPr.
PERFORMANCE STANDARD 3 – RESOURCE EFFICIENCY AND POLLUTION PREVENTION			
▲ To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. ▲ To promote more sustainable use of resources, including energy and water. ▲ To reduce project related GHG emissions.	**YES**	The EIA process for the proposed Soyuz WEF cluster includes a comprehensive assessment of the impacts of the proposed project with respect to resource efficiency and pollution prevention. The Environmental Management Programmes (EMPrs) address the impact of pollution, littering, handling of hazardous waste, protection of water resources and energy efficiency on site. These EMPrs, include various additional management plans, to ensure that the roles of the various role players are clearly defined to identify how best to manage the state of the receiving environment. These mitigation measures and management outcomes underpin the success or failure of a project from an implementation perspective (in the context of the receiving environment) and are ultimately the most important outcome of the EIA process.	EIR, Chapter 9 and Appendix H. Appendix G, Environmental Management Programmes (EMPrs)

OBJECTIVE	COMPLIANCE STATUS	RESPONSE	REFERENCE
		In addition to the above, the Soyuz project is a renewable energy project that will contribute significantly to climate change mitigation The EIAr and Environmental Management Programmes address IFC Performance Standard 3.	
PERFORMANCE STANDARD 4 – COMMUNITY HEALTH, SAFETY AND SECURITY			
▲ To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. ▲ To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.	**YES**	The EIA process for the proposed Soyuz WEF cluster includes a comprehensive stakeholder engagement process (according to EIA Regulation specifications) where communities and other stakeholders are able to raise any concerns relating to the project. In addition, a detailed Socio-economic Impact Assessment has been conducted that includes key principles and management outcomes to mitigate negative social impacts associated with labour and working conditions, and to enhance social benefits associated with the development. The EIAr process and Socio-economic Impact Assessment addresses IFC Performance Standard 4.	EIR, Chapter 11 and Appendix C Appendix E, Socio-Economic Impact Assessment
PERFORMANCE STANDARD 5– LAND ACQUISITION AND INVOLUNTARY RESETTLEMENT			
▲ To avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs. ▲ To avoid forced eviction. ▲ To anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that	**YES**	The EIA process confirms that no displacement of communities will be required for the successful implementation of these projects. This process can confirm this in four ways. Firstly, the NEMA EIA Regulations application process requires proof of landowner consent as part of the process. Secondly, the landowners have agreements in place, with the developer, to receive compensation for the land on which the development is proposed. Thirdly, individuals living on the land on which the	Application Process, EIA Report (Chapter 11 and Appendix C), Appendix E, Socio-Economic Impact Assessment, Visual Impact Assessment and Noise Impact Assessment

OBJECTIVE	COMPLIANCE STATUS	RESPONSE	REFERENCE
resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. • To improve, or restore, the livelihoods and standards of living of displaced persons. • To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.		development is proposed are protected by a number of specialist buffers, including noise and visual assessments. And finally, the NEMA EIA Regulations (Chapter 6) have strict public consultation processes, during which landowners (and surrounding landowners) are required to be engaged throughout. The EIA process, inclusive of the Noise, Socio-economic and Visual Impact Assessments, and PPP processes address IFC Performance Standard 5.	
PERFORMANCE STANDARD 6 – BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES			
• To protect and conserve biodiversity. • To maintain the benefits from ecosystem services. • To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.	**YES**	The South African EIA process includes a number of legislative requirements in addition to the NEMA EIA Regulations. These legislative requirements are outlined in Chapter 4 of the EIA Report and requires a comprehensive assessment of biodiversity and ecosystem impacts. In addition to legislative requirements there are also a number of guidelines which must be applied to the planning of a renewable energy facility in South Africa. Two of the key guidelines relate to the conservation of biodiversity. The first is the "South African Best Practice Guidelines for Pre-construction Monitoring of Bats at Wind Energy Facilities, 5th Edition: April 2020". The has been applied to this project, as per the Bat Impact Assessment. The second is the "Birds and Wind-Energy Best-Practice Guidelines Best-Practice Guidelines for assessing and monitoring the impact of wind energy facilities on birds in southern Africa Third Edition, 2015". This has also been applied to this project, as per the Avifaunal Impact Assessment. The aim of these monitoring, risks assessment, and impact assessment processes are to identify sensitive areas and sensitive species. The mitigation hierarchy	Appendix E, Avifaunal Monitoring and Impact Assessment, Bat Monitoring and Impact Assessment, Botanical Impact Assessment, Faunal Impact Assessment, Aquatic/ Freshwater Impact Assessment. Appendix G, EMPrs.

OBJECTIVE	COMPLIANCE STATUS	RESPONSE	REFERENCE
		is then applied by the specialists before the recommendations are then carried through into the EIA phase of the process. In addition to the avifaunal and bat assessments, the sites also underwent aquatic/freshwater, botanical, faunal impact assessments. These assessments included seasonally appropriate site investigations, risk assessments, and impact assessment processes. With the aim of identifying sensitive areas and sensitive species. The mitigation hierarchy is then applied by the specialists before the recommendations are then carried through into the EIA phase of the process. Sensitive areas are graded by specialists to reveal no-go, high, moderate and low sensitivities in a biodiversity context. Layouts are required to be adjusted to ensure that no-go areas are avoided. The impacts associated with development within the remaining areas are then mitigated through either avoidance, minimising or restoration (or a combination of all three). This is the key to sustainable development and the purpose of Chapter 8, Chapter 9 and Chapter 10 of this EIA process. These recommendations, mitigation measures and management outcomes underpin the Environmental Management Programmes as the key outcome of the EIA process. The Avifaunal Monitoring and Impact Assessment, Bat Monitoring and Impact Assessment, Freshwater/Aquatic Impact Assessment, Botanical Impact Assessment and Faunal Impact Assessment are key studies which, together with the EIR and EMPrs, address IFC Performance Standard 6.	
PERFORMANCE STANDARD 7 – INDIGENOUS PEOPLES			

OBJECTIVE	COMPLIANCE STATUS	RESPONSE	REFERENCE
▲ To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples. ▲ To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts. ▲ To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. ▲ To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. ▲ To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present. ▲ To respect and preserve the culture, knowledge, and practices of Indigenous Peoples.		The EIA process for the proposed Soyuz WEF cluster includes a detailed Socio-economic Impact Assessment. The Socio-economic Impact Assessment includes key principles and management outcomes to mitigate negative social impacts associated with labour and working conditions, and to enhance social benefits associated with the development. In addition to these principals, the SEIA also specifies the need for the employment of local people within a radius of 50km of the site. This aims to ensure that the local community is protected during the development and that they benefit from the development. The PPP process also includes distribution of documentation to ensure, as per NEMA EIA Regulations Chapter 6, is fair and just. Document dissemination is done digitally and in hard copy format. And the notification of the EIA process is also done in two languages to ensure that the local culture and context of the receiving community is considered. The Socio-economic Impact Assessment and NEMA EIA PPP process address IFC Performance Standard 7.	Appendix E, Socio-Economic Impact Assessment. EIA Report (Chapter 11 and Appendix C)
PERFORMANCE STANDARD 8 – CULTURAL HERITAGE			
▲ To protect cultural heritage from the adverse impacts of project activities and support its preservation. ▲ To promote the equitable sharing of benefits from the use of cultural heritage.	**YES**	The sites underwent both heritage (archaeological) and palaeontological assessments to ensure that the cultural integrity of the area is protected. This is done by site investigations, risk assessments, and impact assessment processes. With the aim of identifying sensitive areas and ensuring that they are either avoided or sufficiently buffered to ensure protection. The mitigation hierarchy is then applied by the specialists before the recommendations are then carried through into the EIA phase of the process.	Appendix E, Heritage Impact Assessment, Palaeontological Impact Assessment, Socio-economic Impact Assessment, Noise Impact Assessment and Visual Impact Assessment. EIA Report (Chapter 11 and Appendix C)

OBJECTIVE	COMPLIANCE STATUS	RESPONSE	REFERENCE
		From a current cultural heritage perspective, the Visual Impact Assessment and Socio-Economic Impact Assessment also play a critical role in identifying the impact of a change in sense of place which local communities may feel affected by due to the presence of the development. The PPP process, again, is an integral tool used to ensure that the local community feels heard and that issues raised are addressed in the EIA reporting process. The Heritage Impact Assessment, Paleontological Impact Assessment, Socio-economic Impact Assessment, Noise Impact Assessment and Visual Impact Assessment and the NEMA EIA PPP process address IFC Performance Standard 8.	