DRAFT SCOPING REPORT FOR THE PROPOSED DEVELOPMENT OF THE SOYUZ 4 SOLAR PV PARK NEAR BRITSTOWN, NORTHERN CAPE PROVINCE

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RED ROCKET
Force of Nature

17 MARCH 2022

APPLICABLE LEGISLATION	COMPETENT AUTHORITY REFERENCE NUMBER/S
National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations (2017) (as amended)	Department of Forestry and Fisheries and the Environment (DFFE) REFERENCE NUMBER: 2023-02-0019
Water Use License Application (WULA) in terms of Section 21 of the National Water Act (NWA) (Act No. 39 of 1998)	A Water Use Licence Application will be submitted to the Department of Water and Sanitation (DWS) for Section 21(c) and (i) water uses.
National Heritage Resource Act (No. 25 of 1999)	A Heritage Impact Assessment will be submitted the South African Heritage Resources Agency (SAHRA).

Report Title	Draft Scoping Assessment Report for public consultation for the proposed development of the Soyuz 4 Solar PV Park and associated infrastructure near Britstown, Northern Cape Province.
Author and Environmental Assessment Practitioner (EAP)	**Wendy Mey** (Terramanzi Group (Pty) Ltd) Natasha Williams (Terramanzi Group (Pty) Ltd) Kristen Shaw (Terramanzi Group (Pty) Ltd) Tarryn Frankland (Terramanzi Group (Pty) Ltd) Zandria Jordaan (Terramanzi Group (Pty) Ltd)
Specialist Sub-Consultants	Alien Invasive Management Plan – NCC Environmental Services (Pty) Ltd (C/O - Sean Altern) Avifaunal Scoping Assessment – Enviro-Insight cc (C/O Luke Verburgt) Biodiversity Scoping Assessment - SAS Environmental Group of Companies (Pty) Ltd (C/O Charne Gouws) Climate Change Assessment – Airshed Planning Professionals (Pty) Ltd (C/O Hanlie Liebenberg-Enslin) Freshwater Ecological Scoping Assessment – SAS Environmental Group of Companies (Pty) Ltd (C/O Paul Da Cruz) Geotechnical Reconnaissance Study - GEOSS South Africa (Pty) Ltd (C/O Louis Jonk) Heritage Scoping Assessment – ACO Associates cc (C/O John Gribble) Noise Scoping Assessment – dBA Acoustics (C/O Barend van der Merwe) Social Scoping Assessment - Tony Barbour Environmental Consulting (C/O Tony Barbour) Soil, Landuse and Land Capability Scoping Assessment - SAS Environmental Group of Companies (Pty) Ltd (C/O Tshiamo Setsipane) Town Planning - Warren Petterson Planning (C/O Soné vd Merwe)

	Traffic Scoping Assessment - Innovative Transport Solutions (C/O Christoph Krogscheepers) Visual Scoping Assessment - SAS Environmental Group of Companies (Pty) Ltd (C/O Sanja Erwee)
Client	Soyuz 4 Solar PV Park (Pty) Ltd C/O Matteo Giulio Luigi Brambilla
Report Version	Draft Scoping Report for Public Consultation
Submission Date	17 March 2023

Please use the following as a reference for this Report:

Terramanzi Group Project Number: 221101 - 04

Project Title: Draft Scoping Report for public consultation for the proposed development of the Soyuz 4 Solar PV Park and associated infrastructure near Britstown, Northern Cape Province.

Project Overview and Purpose of this Scoping Report

Soyuz 4 Solar PV Park (Pty) Ltd proposes the development of the Soyuz 4 Solar PV Park and associated infrastructure ("the Project"), near Britstown, Northern Cape Province. The Project will be located on Portion 5 of Farm 127. The Photo Voltaic Solar Energy Facility (PVSEF) will have a generating capacity of no more than 300MW and Battery Energy Storage Systems (BESS) of 1200MWh. Bi-facial, single axis trackers will be utilised for the panels. An on-site substation with a capacity of 300MVA, will enable the connection of a 132kV Overhead Powerline (OHPL). The final interconnection solution will be dependent on the requirements of Eskom, which are still to be defined. The purpose of the facility is to generate clean electricity from a renewable energy source (i.e., solar radiation) in order to contribute to the National energy grid and/or any Private off takers (where applicable).

In order for the Soyuz 4 Solar PV Park to become operational, the Applicant is required to obtain Environmental Authorisation for the Project. Terramanzi Group (Pty) Ltd (hereinafter referred to as "TMG") have been appointed has been appointed by the Applicant as the Independent Environmental Assessment Practitioner (EAP) to facilitate the Scoping and Environmental Impact Assessment (S&EIA) process to obtain environmental authorisation in terms of the National Environmental Management Act ("NEMA") Environmental Impact Assessment (EIA) Regulations (2014), as amended.

This Draft Scoping Report forms part of the above permitting process and is included with this first public consultation opportunity for Interested and Affected Parties (hereinafter referred to as "I&APs") and commenting authorities to participate in the permitting process, to share their comments, concerns and suggestions with the Applicant, Professional Team, the EAP and Competent Authority. This consultation process will ensure that any aspects not already raised in this Report, can be recorded and considered as part of the environmental permitting process, which will ultimately be decided on by the Competent Authority, the Department of Forestry, Fisheries and the Environment (DFFE).

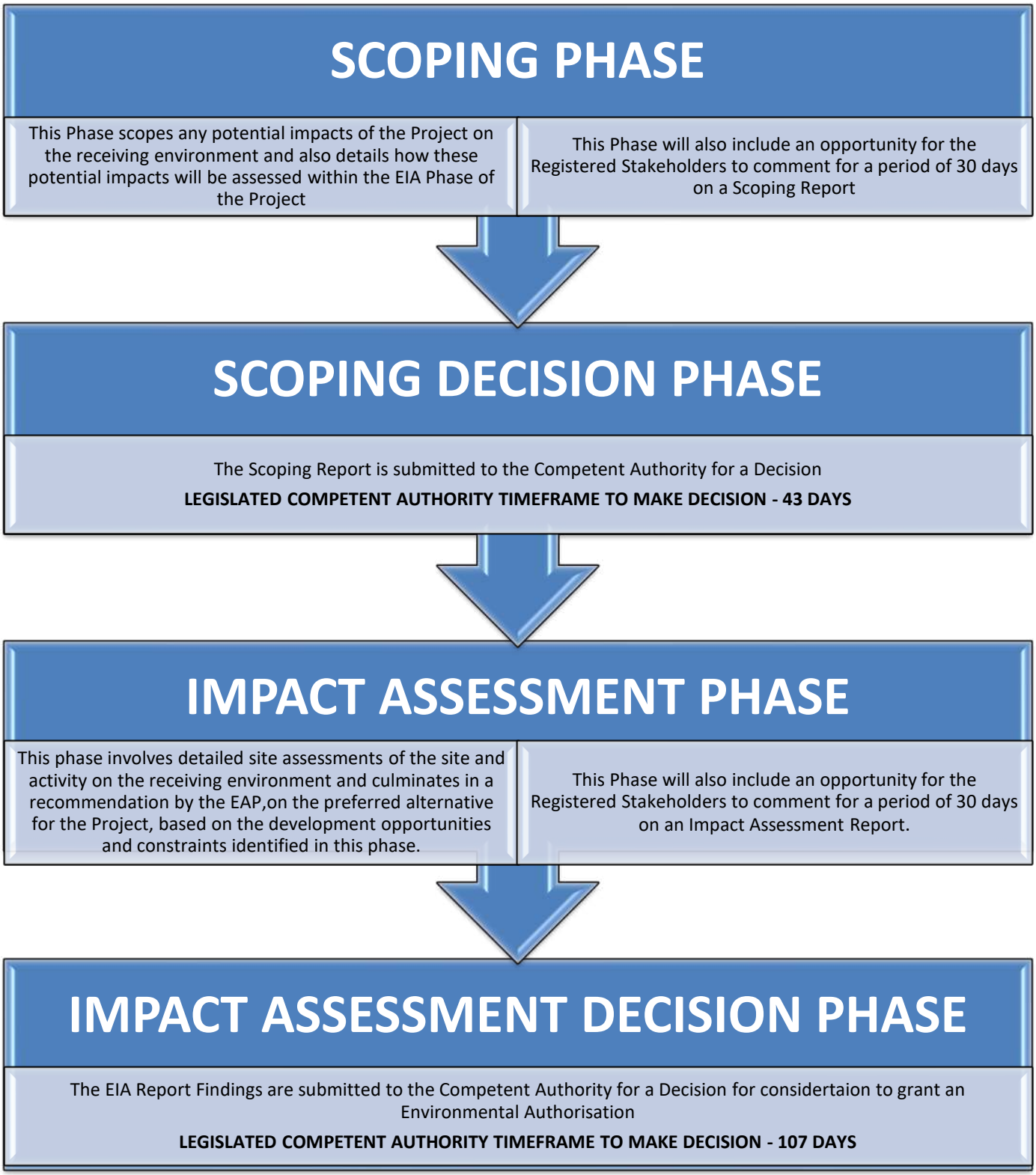
I&APs are invited to register to participate in the Public Participation Process (PPP). This Draft Scoping Report for public consultation and supporting documentation will be available for comment for the statutory 30 calendar day commenting period from **Monday, 20 March 2023** up to and including **Friday, 21 April 2023**. All comments received during this PPP will be recorded in a Comments and Responses Report and addressed as part of the environmental permitting process. The feedback from the DFFE regarding the Scoping Phase will be provided to Registered I&APs once a decision on the Scoping Phase has been made. All Registered I&APs will be provided an additional statutory commenting period of 30-days to provide comments and concerns during the EIA Phase of the Project.

The site has been assessed by independent experts as part of this Scoping Phase Assessment in addition to allowing for the development of a Scoping Level Opportunities and Constraints Map to guide the Applicant and Professional Team with any further development considerations for the site.

This "Opportunities and Constraints Map" has been developed to provide a clear and accountable illustration of areas that are immediately deemed suitable and those areas which are considered potentially problematic and would require more detailed assessment during the EIA Phase of the Project. The Applicant has chosen to only assess a layout during the EIA Phase of the Project, which will be based on the findings of this Scoping Report. This will place the PVSEF in the most suitable location of the site and ensure that the best environmental practical option is implemented. The final layout will be considered acceptable and implementable by all of the independent specialists and will be presented to registered I&APs, commenting authorities and the Competent Authority for comment during the EIA Phase of the environmental permitting process.

Summary of What the Scoping Report Entails and Details:

- Details of the EAP;
- Location of the proposed development;
- Plan which locates the proposed activity or activities applied for at an appropriate scale;
- Description of the scope of the proposed activity;
- Description of the policy and legislative context applicable to the proposed development;
- Motivation for the need and desirability for the proposed development;
- Full description of the process followed to reach the proposed preferred activity, site and location within the site;
- Plan of study for the EIA process to be undertaken; and
- Undertakings under oath or affirmation by the EAP.



Public Participation Process for Scoping Report

This Draft Scoping Report will be made available for comment for a period of 30 calendar days from **Monday, 20 March 2023 up to and including Friday, 21 April 2023.**

The report is available for download via the following link:
https://terramanzi.egnyte.com/fl/Eujj33H3DU

Comments must be submitted directly to Terramanzi Group (Pty) Ltd, as follows:

- Electronic mail: comments@terramanzi.co.za; or
- Facsimile: 086 558 1213; or
- Post: Postnet Suite 211, Private Bag X26, Tokai, Cape Town
- For Attention: **Wendy Mey**
- Terramanzi Project Reference Number: 221101-04
- Visit us at www.terramanzi.co.za

COMMENTS RECEIVED AFTER 21 APRIL 2023 WILL NOT BE CONSIDERED FOR THIS PHASE OF THE PROJECT

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Please note that the Appendices are located after this Scoping Report and have detailed Cover Pages available to facilitate document navigation for the reader.

APPENDIX A – Site Maps

APPENDIX B –Specialist Reports

- Avifaunal Scoping Assessment – Compiled by Luke Verburgt from Enviro-Insight cc dated February 2023
- Biodiversity Scoping Assessment – Compiled by Charne Gouws from SAS Environmental Group of Companies (Pty) Ltd dated February 2023
- Climate Change Assessment – Compiled by Hanlie Liebenberg-Enslin from Airshed Planning Professionals (Pty) Ltd (C/O) date February 2023
- Freshwater Ecological Scoping Assessment – Compiled by Paul Da Cruz from SAS Environmental Group of Companies (Pty) Ltd dated February 2023
- Geotechnical Reconnaissance Study - Compiled by Louis Jonk from GEOSS South Africa (Pty) Ltd dated February 2023
- Heritage Scoping Assessment – Compiled by John Gribble from ACO Associates cc dated February 2023
- Noise Scoping Assessment – Compiled by Barend van der Merwe from dBA Acoustics dated xx February 2023
- Social Scoping Assessment – Compiled by Tony Barbour from Tony Barbour Environmental Consulting dated February 2023
- Soil, Landuse and Land Capability Scoping Assessment – Compiled by Tshiamo Setsipane from SAS Environmental Group of Companies (Pty) Ltd dated February 2023

- Town Planning – Compiled by Soné vd Merwe from Warren Petterson Planning dated February 2023
- Traffic Scoping Assessment – Compiled by Christoph Krogscheepers from Innovative Transport Solutions dated March 2023
- Visual Scoping Assessment – Compiled by Sanja Erwee from SAS Environmental Group of Companies (Pty) Ltd dated February 2023

APPENDIX C – Public Participation Folder

- Newspaper Advertisement – March 2023
- Site Notice – March 2023
- Stakeholder Letter – March 2023
- Stakeholder Database

APPENDIX D – Environmental Management Programme (EMPr)

- Only applicable in the EIA Phase

APPENDIX E – Authorisations & Competent Authority Correspondence:

- Request for Pre-Application Meeting
- Pre – Application Meeting Minutes Approval

APPENDIX F – Application and declarations

- EA application form –March 2023
- Applicant Declaration – March 2023
- EAP Declaration – March 2023
- EAP Oath – November 2022

APPENDIX G – EAP Curriculum Vitae

APPENDIX H – Landowner Consent

APPENDIX I – Definitions, Terminology and Acronyms

- Abbreviations
- Glossary of Terms

1 DEFINITIONS AND TERMINOLOGY REFERRED TO IN THIS REPORT

Please consult APPENDIX I for the Definitions, Acronyms and Terminology referred to in the Report.

2 INTRODUCTION TO THE PROJECT

Red Rocket South Africa (Pty) Ltd intends to develop the **Soyuz Solar PV Cluster 1-6** comprising of six (6) Photovoltaic Solar Energy Facilities (PVSEFs). This development is situated approximately 14km South-east of Britstown in the Northern Cape Province. Figure 1 depicts the regional location of the renewable energy site.

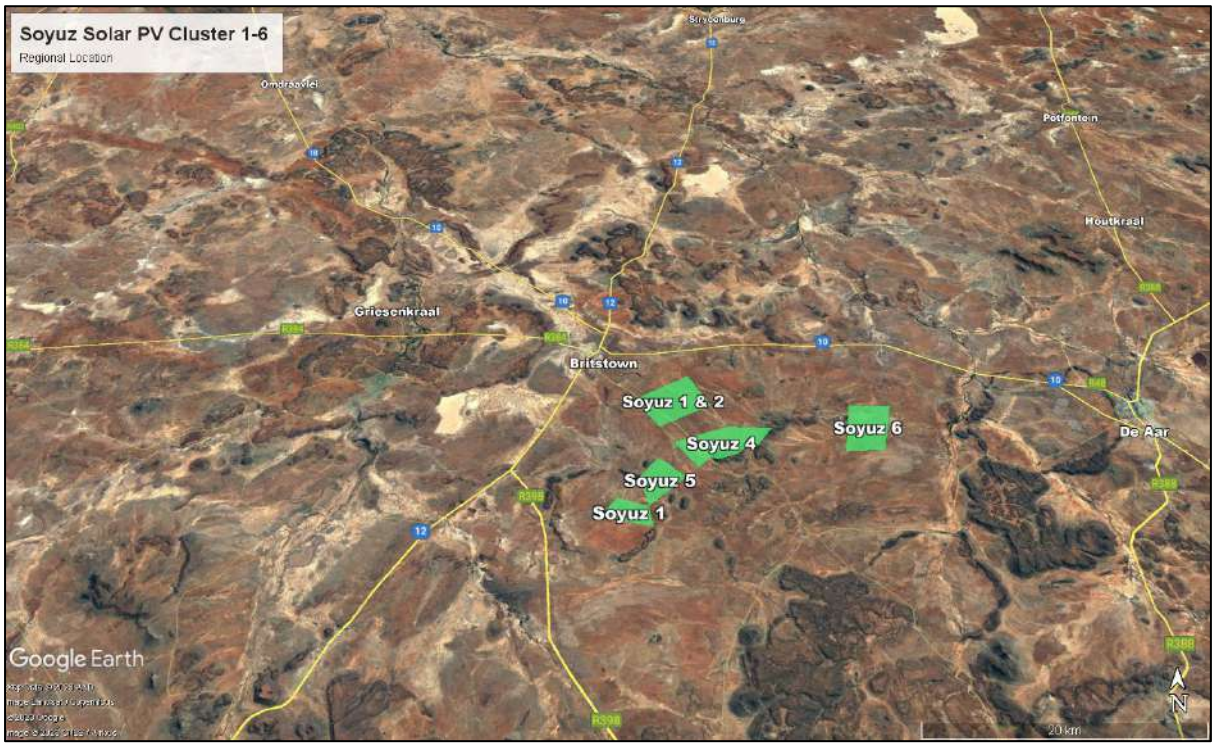


Figure 1 Regional Location of the Soyuz Solar PV Cluster 1-6

The proposed development layout is shown in Figure 2. Due to commercial reasons, each of the six (6) PVSEFs will fall under a different applicant. The applicant names with respective generating capacities are as follows:

Soyuz 1 Solar PV Park (Pty) Ltd - 240MW
Soyuz 2 Solar PV Park (Pty) Ltd – 300MW
Soyuz 3 Solar PV Park (Pty) Ltd – 240MW
Soyuz 4 Solar PV Park (Pty) Ltd – 300MW
Soyuz 5 Solar PV Park (Pty) Ltd – 150MW
Soyuz 6 Solar PV Park (Pty) Ltd – 240MW

Six (6) separate environmental application processes are required (i.e., one for each solar cluster). This Scoping Report forms part of the environmental authorisation process for the **Soyuz 4 Solar PV Park** under the applicant name, **Soyuz 4 Solar PV Park (Pty) Ltd**.

Figure 2 Soyuz Solar PV Cluster 1-6 Overall Layout

2.1 OVERVIEW OF THE ENVIRONMENTAL APPLICATION PROCESS

The National Environmental Management Act, 107 of 1998 (NEMA) is the key legislation in South Africa governing environmental authorisation. The listed activities in Section 24 of NEMA are associated with the Environmental Impact Assessment (EIA) regulations published in Government Notices R327, R325 and R324 (as amended) in Government Gazette 40772.

An EIA is a systematic process of evaluating the potential environmental effects of a proposed project or development. The purpose of an EIA is to identify, predict, and evaluate the likely environmental impacts of a project, and to propose measures to mitigate or manage those impacts. The main function of an EIA is to inform the decision-making process by clearly presenting pertinent information

The first step is for the applicant to engage with the relevant authorities, stakeholders and affected communities to determine if an EIA is required and what information is needed to submit an application. Once the applicant has determined that an EIA is required, they must appoint an EAP to conduct the application procedure for the Environmental Authorisation (EA).

There are two categories of prescribed processes namely the Scoping and Environmental Impact (S&EIA) process and the Basic Assessment (BA) process. The Government Notices in Government Gazette 40772 include the listed activities of the NEMA EIA Regulations that instruct if a BA or S&EIA process is required.

The EAP must complete and submit the application form to the competent authority (CA) indicating that either a BA or a S&EIA process is to be followed. The CA reviews the application and within 10

days of the receiving application the competent authority must acknowledge if the application is permitted and if it is rejected or accepted.

After the acknowledgment that the application is permitted and accepted for a S&EIA process, the scoping report is compiled by the EAP with inputs from specialists and subject matter experts. A draft version of the scoping report is made available to I&APs for review and comment for 30 days as part of the PPP.

A Comments and Responses Report (CRR) is developed as a record of the stakeholder comments and corresponding responses. The scoping report is updated to a final version taking into consideration the I&APs comments and concerns and submitted to the CA for deliberation. The final scoping report must be submitted to the CA within 44 days following the submission of the application form.

The CA has 43 days after receipt of the final scoping report and supporting documentation to accept or decline the report and the Plan of Study for the EIA. A new application must be submitted if the scoping report is rejected.

The impact assessment phase involves the preparation of an environmental impact report, which assesses the potential impacts of the proposed activity on the environment and identifies mitigation measures to reduce or avoid these impacts. The draft EIA report must be issued for public consultation for no less than 30 days and an Environmental Management Programme (EMPr) must be linked with an EIA report. The CRR will be updated with the impact assessment phase stakeholder comments and responses. The EIA report is revised to include the changes as per the PPP and the final report is submitted together with the EMPr and supporting documentation to the CA for decision. The final report must be issued to the CA within 106 days of the scoping report decision.

The CA must recognise the receipt of the report in less than 10 days and has 107 days to review the documentation and make a decision to approve or reject the application, or approve it subject to certain conditions. This decision is communicated to the applicant and all I&APs.

If the application is approved, the applicant must implement the project according to the conditions set out by the CA. The competent authority will monitor the implementation of the project and its impacts on the environment and may take enforcement action if necessary.

It is important to note that the EIA process in South Africa is designed to be inclusive and participatory and provides opportunities for I&APs to participate and provide input throughout the process. The S&EIA Process for the Soyuz 4 Solar PV Park is depicted in Figure 3. The phases highlighted in blue above illustrate phases completed and underway. The phases highlighted in green are pending.

Figure 3 Overview of the S&EIA Process

2.2 CONTENT OF THIS DRAFT SCOPING REPORT

This Draft Scoping Report (DSR) for public consultation contains the necessary information for an appropriate understanding of the Project and associated Environmental Application Process. The document describes the site, alternatives considered, the scope of the assessment, the consultation process to be followed and any findings and recommendations at this stage of the Environmental Application Process.

Table 1 highlights the minimum criteria to be satisfied for a Scoping Report as guided by the NEMA EIA Regulations (2014 as amended in April 2017). The location of this content in the DSR is provided alongside the requirements for ease of reference.

Table 1 Minimum Criteria to be Satisfied for a Scoping Report

Regulation	Scope of Assessment and Content of Environmental Impact Assessment Reports	Relevant Section of this Report
A2 R2 (1)(a)	Details of:	
(i)	The EAP who prepared the report; and	Section 3.2
(ii)	The expertise of the EAP, including a curriculum vita	Section 3.2
A2 R2 (1)(b)	The location of the activity, including:	
(i)	The 21-digit Surveyor General code of each cadastral land parcel;	Section 3.3
(ii)	Where available, the physical address and farm name; and	Section 3.3
(iii)	Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	Section 3.3
A2 R2 (1)(c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is-	
(i)	a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	Section 3.4
(ii)	on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 3.4
A2 R2 (1)(d)	A description of the scope of the proposed activity, including:	
(i)	All listed and specified activities triggered; and	Section 4.3
(ii)	A description of the activities to be undertaken, including associated structures and infrastructure	Section 4.2
A2 R2 (1)(e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 5
A2 R2 (1)(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 6
A2 R2 (1)(g)	A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including:	
(i)	Details of all alternatives considered;	Section 8
(ii)	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 13
(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;	Section 13.7
(iv)	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 7
(v)	The impacts and risks which have informed the identification of each alternative including the nature, significance, consequence, extent,	Section 9

Regulation	Scope of Assessment and Content of Environmental Impact Assessment Reports	Relevant Section of this Report
	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	
(vi)	The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives	Section 10
(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;	Section 11
(viii)	The possible mitigation measures that could be applied and level of residual risk;	Section 11
(ix)	The outcome of the site selection matrix	Section 9
(x)	If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such	Section 8
(xi)	A concluding statement indicating the preferred alternative including preferred location of the activity.	Section 8.4
A2 R2 (1)(h)	A plan of study for undertaking the environmental impact assessment process to be undertaken, including-	
(i)	A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity	Section 16
(ii)	A description of the aspects to be assessed as part of the environmental impact assessment process	Section 16
(iii)	Aspects to be assessed by Specialists	Section 16
(iv)	A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists	Section 16
(v)	A description of the proposed method of assessing duration and significance	Section 16
(vi)	An indication of the stage at which the competent authority will be consulted	Section 16
(vii)	Particulars of the public participation process that will be concluded during the environmental impact assessment process	Section 16
(viii)	A description of the tasks that will be undertaken as part of the environmental impact assessment process	Section 16
(xi)	Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Section 16
A2 R2 (1)(i)	An undertaking under oath or affirmation by the EAP in relation to-	

Regulation	Scope of Assessment and Content of Environmental Impact Assessment Reports	Relevant Section of this Report
(i)	The correctness of the information provided in the report	Section 14
(ii)	The inclusion of comments and inputs from Stakeholders and interested and affected parties	Section 14
(iii)	Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties	Section 14
A2 R2 (1)(j)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.	Not Applicable
A2 R2 (1)(k)	Where applicable, any specific information required by the competent authority, and	Not Applicable
A2 R2 (1)(l)	Any other matter required in terms of section 24(4)(a) and (b) of the Act	Not Applicable
A2 R2 (1)(2)	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a scoping report, the requirements as indicated in such notice will apply.	Not Applicable

2.3 OBJECTIVES OF THE SCOPING PROCESS

In accordance with Appendix 2, the following is noted:

Regulation 1 of GN No. R. 326 of the NEMA EIA Regulations (2014 as amended) states that the objective of the Scoping process is to, through a consultative process-

a) ***Identify the relevant policies and legislation relevant to the activity;***
b) ***Motivate, the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;***
c) ***Identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;***
d) ***Identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographic, physical, biological, social, economic and cultural aspects of the environment;***
e) ***Identify the key issues to be addressed in the assessment phase;***
f) ***Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and***
g) ***Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.***

3 PROJECT DETAILS

3.1 ENTITY RESPONSIBLE FOR DEVELOPMENT OF THE PVSEF

Red Rocket South Africa (Pty) Ltd is proposing the development of the Soyuz 4 Solar PV Park under the legal entity Soyuz 4 Solar PV Park (Pty) Ltd. The names and contact details are provided on Table 2.

Table 2 Entity Responsible for the Development of the PVSEF

DEVELOPMENT ENTITY	
Applicant Name	Soyuz 4 Solar PV Park (Pty) Ltd
Responsible Person	Mr Matteo Giulio Luigi Brambilla
Address	14th Floor Pier Place Heerengracht Street Foreshore Cape Town

DEVELOPMENT ENTITY	
	8001
Contact Details	+27 (0)72 212 1531 (C) Email: m.logan@redrocket.energy

3.2 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) DETAILS, EXPERTISE AND INDEPENDENCE

*In accordance with **Appendix 1 Regulation 3(a) of GN No. R.326 of the NEMA EIA Regulations (2014, as amended)**:*

Details of-

i. The EAP that prepared the report, and
ii. The expertise of the EAP, including curriculum vitae

Terramanzi Group (Pty) Ltd ("TMG"), is the consulting firm appointed to undertake this Application for Environmental Authorisation (EA) on behalf of the Applicant.

Wendy Mey is the independent EAP responsible for compilation and review of this draft report. Wendy is an environmental consultant with more than 18 years of experience. She is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (2021/3684). Wendy holds a BSc in Chemical Engineering from the University of KwaZulu Natal and is a senior member of the Environmental Services Team at TMG.

This report was reviewed by Fabio Venturi whose career spans over 20 years in the industry, across both the government and private sectors of the green economy. Fabio's entrepreneurial drive to innovate and influence has resulted in multiple industry firsts and awards. Fabio is an Accredited Professional with the Green Building Council of South Africa (GBCSA), a Certified Environmental Scientist, served on the South Africa Environmental Industry Body, that being the Western Cape Committee Branch of the South African Affiliate of the International Association for Impact Assessment (IAIAsa), and sat on the National Executive Committee (NEC) of IAIAsa, and is a Certified Carbon Footprint Analyst and Energy Efficiency Auditor.

TMG hereby declares that they have no conflicts of interest related to the work of this report. Specifically, TMG declares that they have no personal financial interests in the property and/or activity being assessed in this report, and that they have no personal or financial connections to the relevant property owners, developers, planners, financiers or consultants of the property or activity, other than fair remuneration for professional services rendered for this report to the Competent Authority. TMG declares that the opinions expressed in this report are independent and a true reflection of their professional expertise.

TMG is a **Level 4 Broad Based Black Economic Empowerment Company** and is **professionally accredited** with a number of relevant industry bodies, in line with the Preferential Procurement Policy Framework Act No. 5 of 2000 (PPPFA).

Please refer to Appendix G for the EAP's Curriculum Vitae

3.3 PROJECT LOCATION

In accordance with ***Appendix 1 Regulation 3(b) of GN No. R. 326 of the NEMA EIA Regulations (2017, as amended)****:*

3(b): *The location of the activity, including:*

- ***i. The 21-digit Surveyor General Code of each cadastral land parcel;***
- ***ii. Where available the physical address and farm name; and***
- ***iii. Where the required information in terms (i) and (ii) is not available, the coordinates of the boundary of the property or properties.***

The site of the proposed Soyuz 4 Solar PV Park is situated approximately 14km South-east of Britstown within the Emthanjeni Local Municipality, which is an administrative area of the Pixley ka Seme District Municipality in the Northern Cape Province. The proposed development will be located on Portion 5 of The Farm 127, Twyfelhoek with an area of 2123.936ha.

The details of the cadastral unit making up the Soyuz 4 Solar PV Park are provided in Table 3 and the area is shown in Figure 4.

Table 3 Cadastral Land Parcel Details

CADASTRAL LAND PARCEL	SG21 DIGITAL CODE	GPS CO-ORDINATES
Farm Twyfelhoek 5/127	C0I2000000000012700005	Eastern corner: 30°40'35.26"S, 23°40'7.81"E
		Northwestern corner: 30°41'27.44"S, 23°34'39.35"E
		Middle point: 30°41'28.57"S, 23°37'17.12"E
		Southwestern corner: 30°42'56.38"S, 23°35'54.27"E

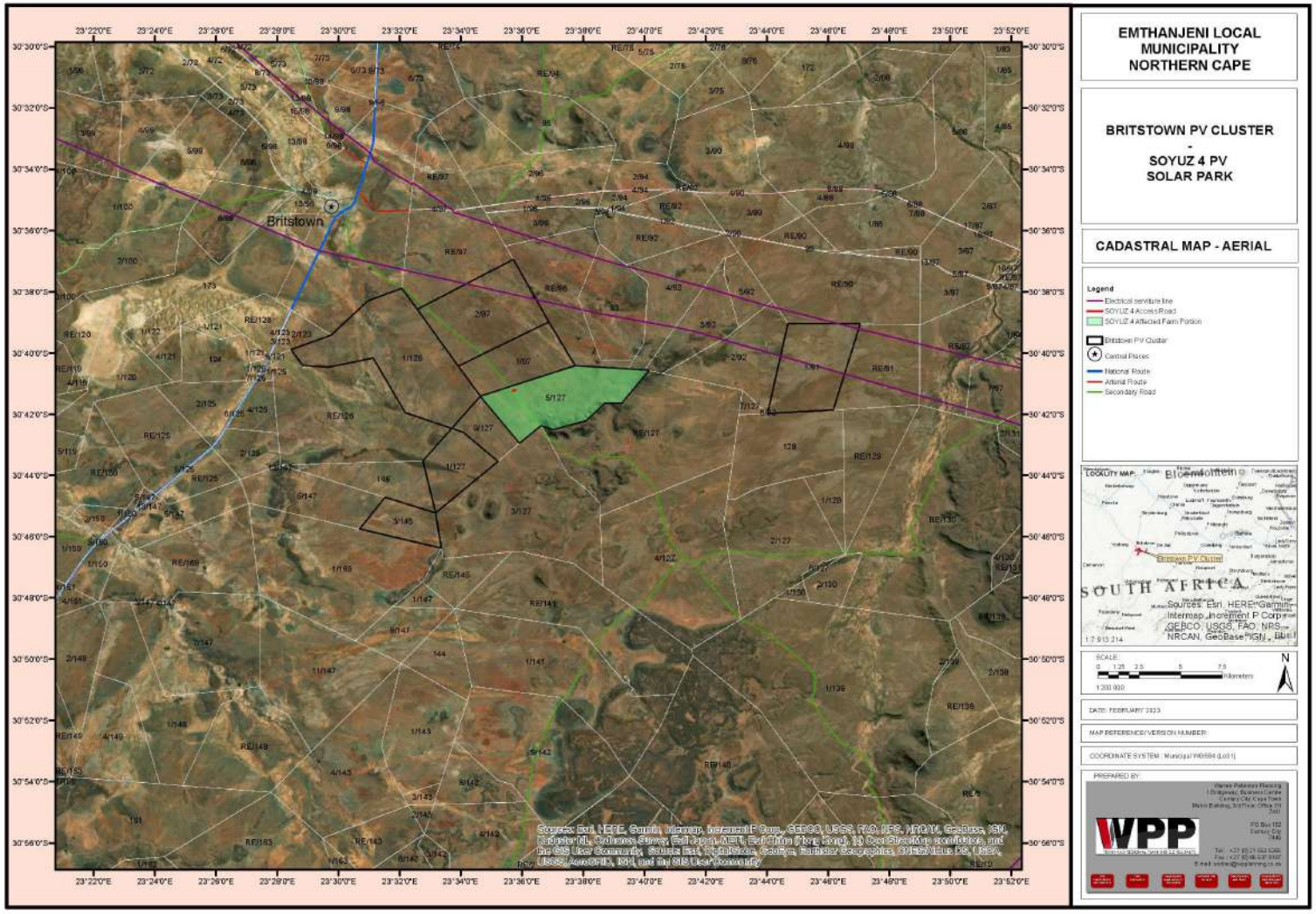


Figure 4 Cadastral Map

3.4 SITE LOCATION OF PVSEF

In accordance with ***Appendix 1 Regulation 3 (c) of GN No. R. 326 of the NEMA EIA Regulations (2014, as amended)****:*

3(c): *A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructures at an appropriate scale, or if it is-*

- ***i. A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken***
- ***ii. On land where the property has not been defined, the coordinates within which the activity is to be undertaken***

The PVSEF is located within the Emthanjeni Local Municipality (ELM) which forms part of the Pixley ka Seme District Municipality (PKSDM). The regional location of this district municipality is shown in red in Figure 5.

Figure 5 Regional location of the Pixley ka Seme District Municipality

[1]The PKSDM is situated in the south-east of the Northern Cape Province and covers an area of 103 222km². It shares its borders with three other provinces, namely the Free State to the east, the Eastern Cape to the south-east, and the Western Cape to the south-west. It is the second-largest district of the five in the province and makes up almost a third of its geographical area.

The main economic sectors comprise of community services (26.6%), agriculture (16.6%), transport (15.1%), trade (12.9%), finance (12.8%), electricity (7.0%), construction (3.3%), manufacturing (3.2%), mining (2.6%).

The PKSDM is made up of eight local municipalities which include Emthanjeni, Kareeberg, Thembelihle, Siyathemba, Renosterberg, Ubuntu, Siyancuma and Umsobomvu municipalities. These are shown in Figure 6. De Aar is the administrative seat of the EML and PKSDM. The town of De Aar is located 23 km to the east of the nearest PVSEF site.

The landscape associated with the PVSEF site is a typical Karoo landscape consisting of dolerite koppies and ridges separated by valley bottoms.

Figure 6 Local Municipalities within PKSDM

[1] *Information sourced from* https://municipalities.co.za/overview/137/pixley-ka-seme-district-municipality

The land uses are linked to livestock farming, specifically sheep farming. The Locality Map for the Soyuz 4 Solar PV Park is provided in Figure 7.

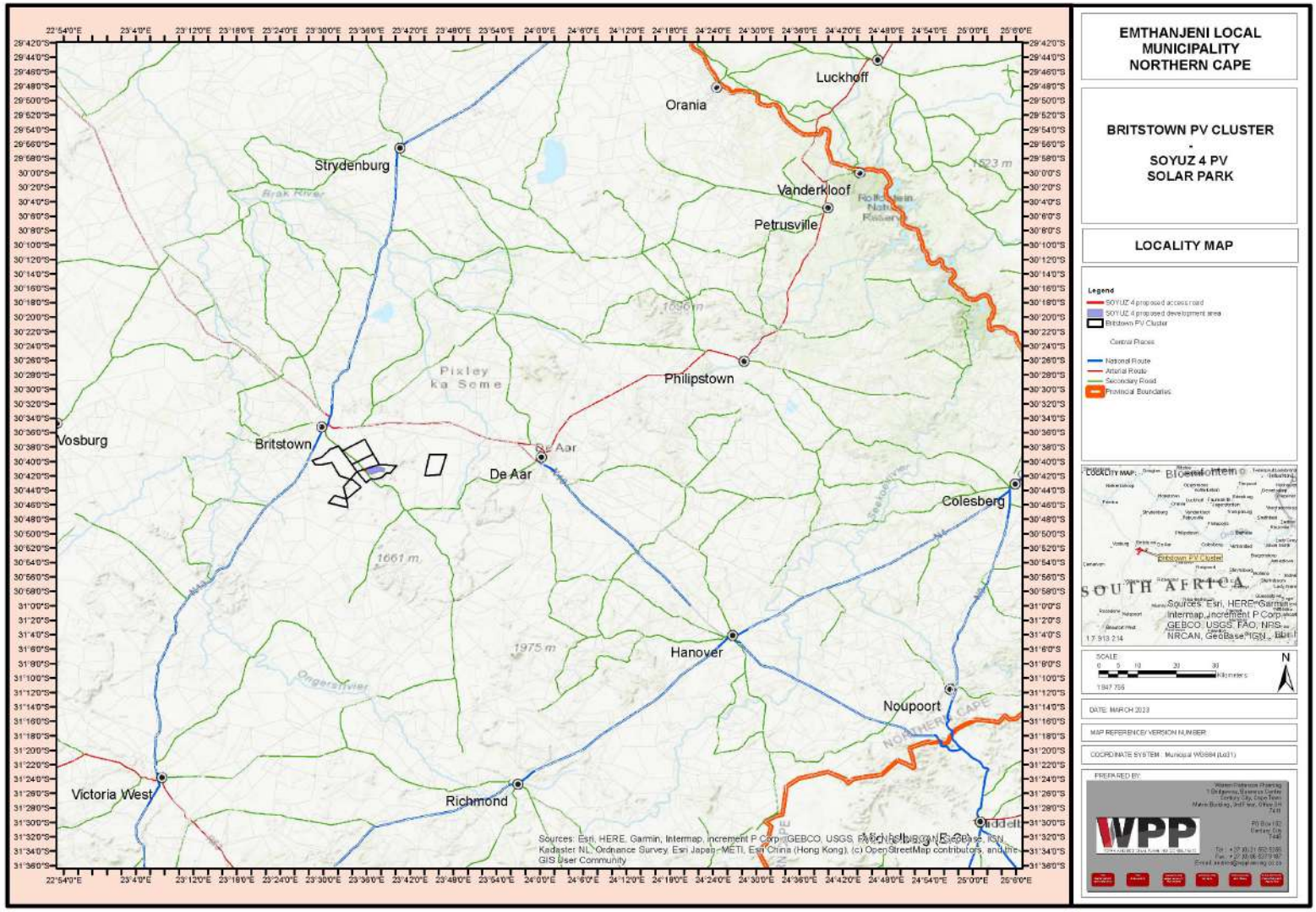


Figure 7 Locality Map

The climate of the proposed site location for the PVSEF is classified as semi-desert with annual rainfall ranging from 100mm upwards. Temperatures in the area can reach up to 50°C. The PKSDM is one of the hottest and driest districts in South Africa, making it an ideal location for solar-energy projects. The PKSDM falls within the Solar Development Corridor as identified in the Northern Cape Provincial Spatial Development Framework (SDF). The corridor extends from Kakamas to Upington and down to De Aar in the south-east (Yellow Corridor in Figure 8).

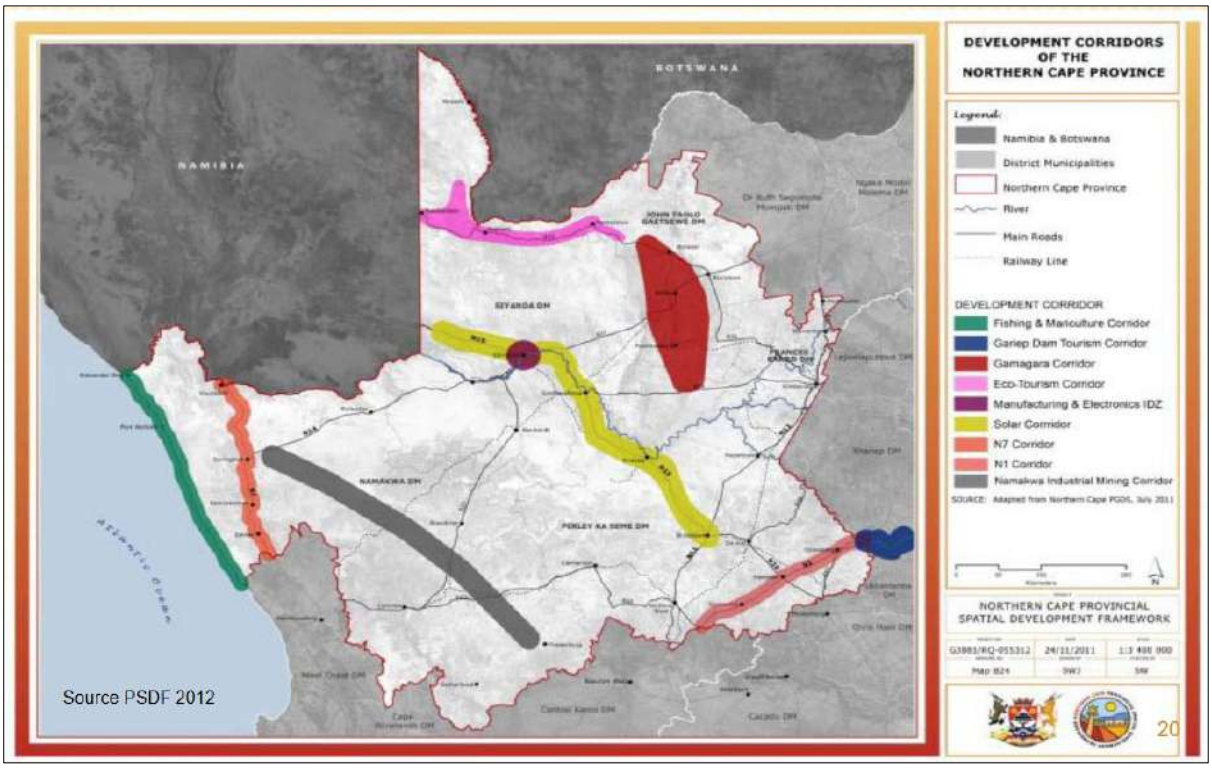


Figure 8 Northern Cape Development Solar Corridor

The project site consists of approximately 2124 hectares of farmland and is well suited for solar installations as it comprises an extensive flat area with little agricultural or natural potential together with a very high solar theme sensitivity.

3.5 LAYOUT OF THE PVSEF

The objective of the Scoping Phase of the Project is to enable the Specialists and the EAP to identify the Best Practical Environmental Option (BPEO) for the development footprint, and to identify studies which are required to be refined during the EIA Phase of the Project. In support of this requirement, an iterative design methodology has been adopted for the Project.

The Scoping Phase for this Project has been used to ensure that the site is well-suited to the activity, and to identify the Opportunities and Constraints of the site for the proposed activity. Independent specialists assessed the affected property of this project upfront and development opportunities and constraints were identified in the form of ''developable'', developable with mitigation" and ''non-developable'' areas. These are spatially represented in Figure 9.

The Applicant will use this information as key inputs to the development of the block plan to locate the proposed facility and associated infrastructure. The area is depicted in Figure 10 and will be assessed during the EIA Phase of this Project.

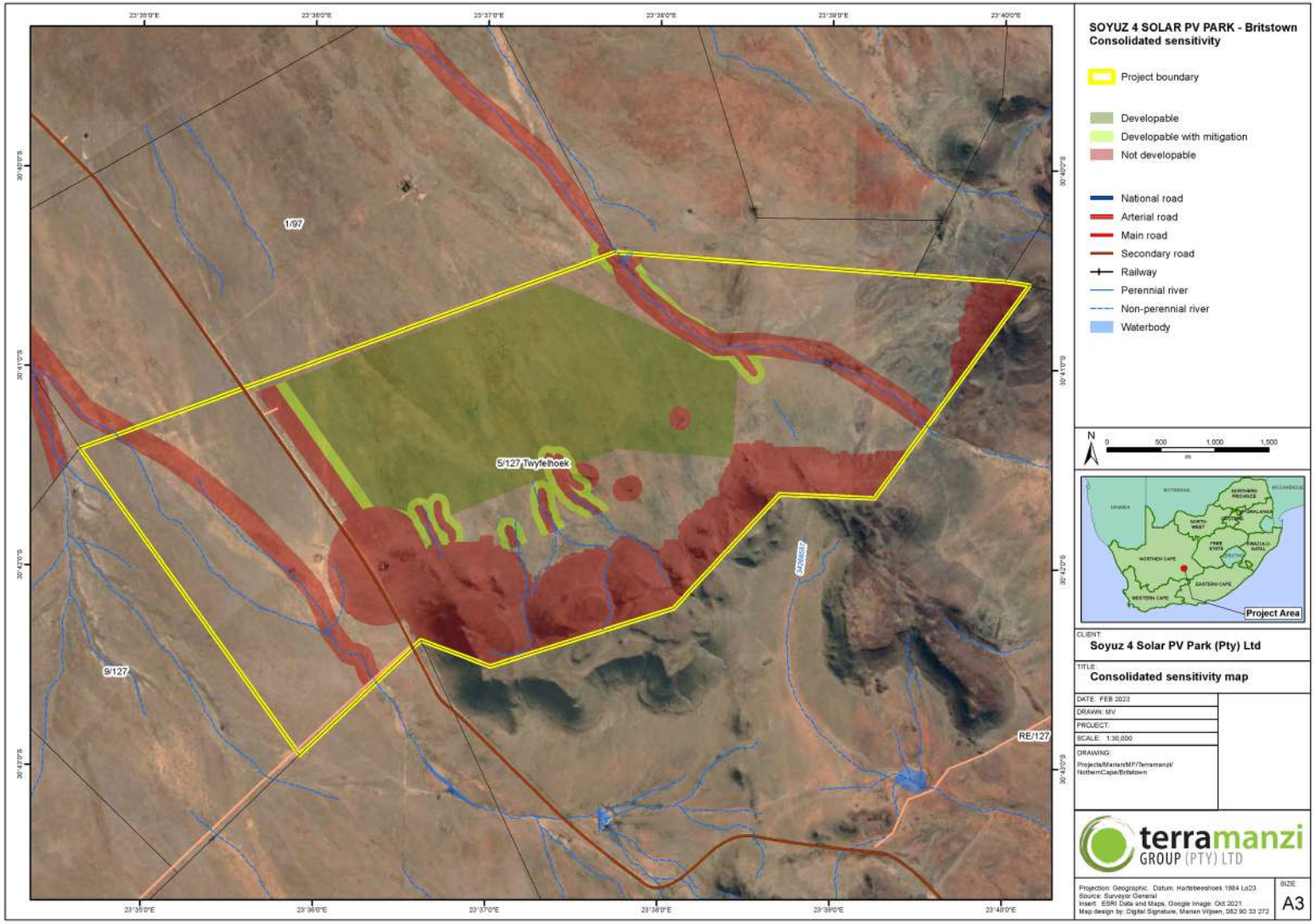


Figure 9 Opportunities and Constraints Map

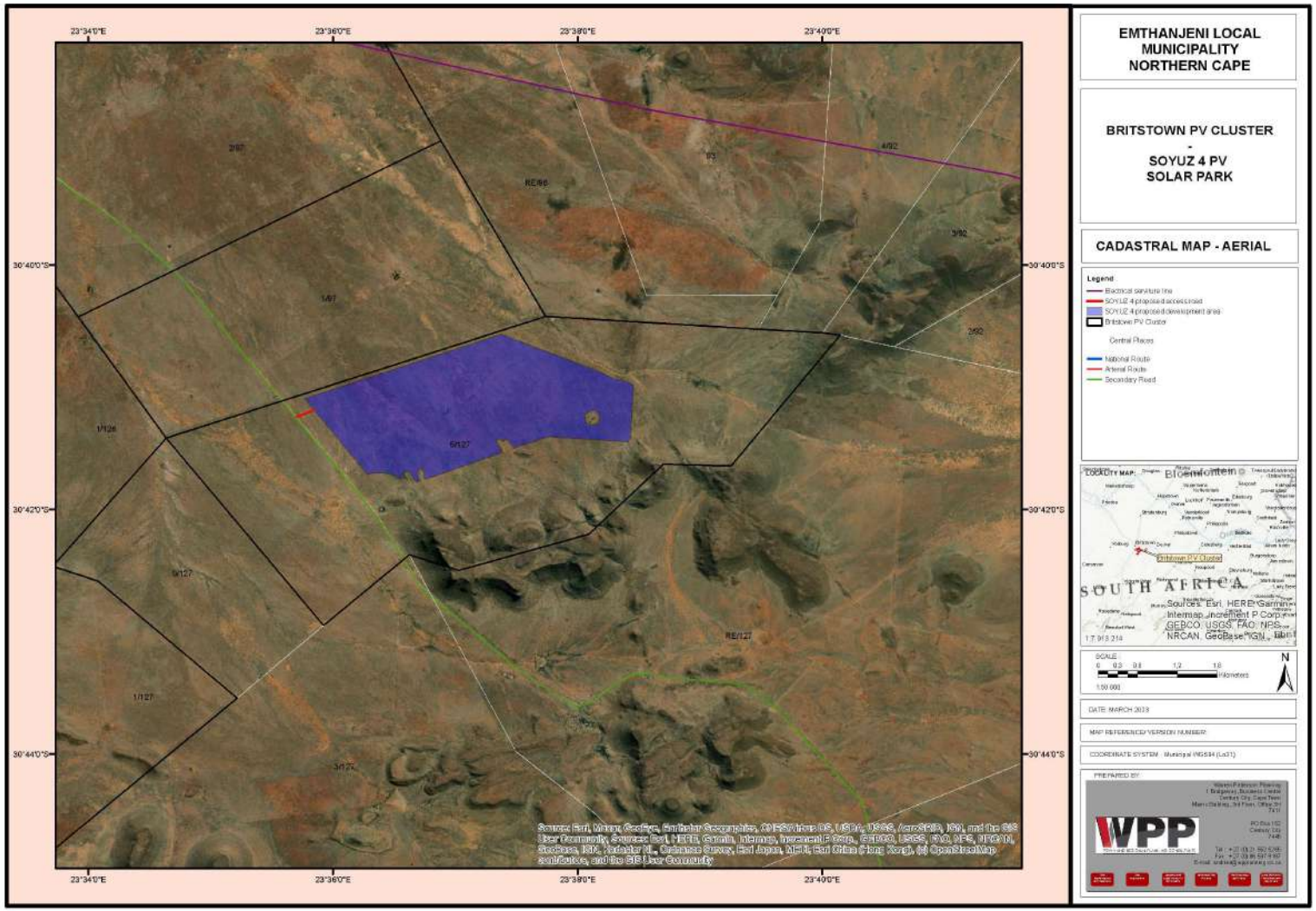


Figure 10 Proposed Development Area

4 SCOPE OF THE PROJECT

*In accordance with **Appendix 2 Regulation 2(1)(d) of GN No. R. 326 of the NEMA EIA Regulations (2014 as amended)**, the following information is presented in this Section:*

i. All listed and specified activities triggered; and
ii. A description of the activities to be undertaking, including associated structures and infrastructures

4.1 PROJECT DESCRIPTION

The Soyuz 4 Solar PV Park will be developed in a single phase and will have a contracted generating capacity of up to 300 megawatts (million watts – MW[2]). Bifacial solar PV modules installed on single axis tracker mounting structure at a height of up to 6 metres (m) above ground level will be utilised for the panels. The site will include Battery Energy Storage Systems (BESS) of 1200 megawatt hour (MWh[3]) with a footprint of 60,000 square metres (m^2).

The associated infrastructure will include:

- Site access roads 8m in width
- Internal access roads 4m in width
- Paved areas with a footprint of 3,000m^2
- Fencing around the development area
- An operations and maintenance (O&M) building with a 1,500m^2 footprint
- Temporary construction camp with a footprint of 10,000m^2
- Temporary laydown areas with a combined footprint of 40,000m^2

An on-site substation with a capacity of 300 megavolt-amperes (MVA[4]), will enable the connection of a 132 kilovolt (kV[5]) Overhead Powerline (OHPL). This will be configured as a 15,000m^2 back-to-back substation, including facility substation, and Eskom collector/switching station with feeder bays. The final interconnection solution will be dependent on the requirements of Eskom, which are still to be defined and will be included in a separate Basic Assessment Process.

4.2 DETAILED DESCRIPTION

A PVSEF is a type of power plant that generates electricity using the energy from the sun. The facility consists of large arrays of solar panels, which are made up of many individual solar cells that convert sunlight into electricity through a process called the photovoltaic effect.

[2] *One megawatt (MW) = 1,000 kilowatts = 1,000,000 watts and is a unit of measure power*
[3] *One megawatt hour (MWh) = 1,000 kilowatts of electricity generated per hour and is used to measure electric output*
[4] *One megavolt-ampere = 1,000,000 volt-amperes and is a unit used for measuring apparent power*
[5] *One kilovolt = 1,000 volts and is a unit of electromotive force*

The photovoltaic effect is a process in which certain materials, typically semiconductors such as silicon, generate an electrical current when exposed to light. This effect is what makes photovoltaic solar cells possible, as they rely on this phenomenon to convert sunlight into electricity.

The photovoltaic effect occurs when photons (light particles) strike the surface of a semiconductor material, causing electrons in the material to be knocked loose from their atoms. These free electrons are then able to flow through the material as an electrical current, creating a voltage difference that can be harnessed to power electrical devices.

Figure 11 An Array of PV Panels once Mounted

The **solar panels** are the main component of the PVSEF. These are made up of many individual photovoltaic cells that convert sunlight into electricity. The solar panels are arranged in rows on a large flat surface area (see Figure 11). Traditional solar panels capture sunlight on one light-absorbing side. The light energy that cannot be captured is simply reflected away.

Bifacial solar panels have solar cells on both sides, which enables the panels to absorb light from the back and the front. This means that a bifacial solar panel can absorb light reflected off the ground or another material.

In general, more power can be generated from bifacial modules for the same area, without having to increase the development footprint.

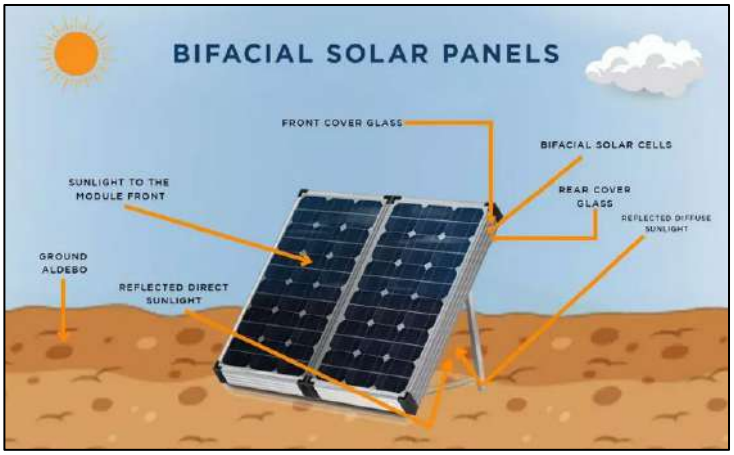


Figure 12 Bifacial Solar Panels

The optimum tilt for a bifacial module has to be designed so as to capture a big fraction of the reflected irradiation. Trackers can be used so the modules can track the sun's movement across the sky, enabling them to stay directed to receive the maximum possible sunlight to generate power.

The PV panels are fixed to **support structures** to maximise exposure to the sun. They can either utilise fixed / static support structures or alternatively single or double axis tracking support structures. PV panels that utilise fixed/static support structures are set at an angle (fixed-tilt PV system), to optimise the amount of solar irradiation (see Figure 13). With fixed/static support structures, the angle of the PV panel is dependent on the latitude of the proposed Project and may be adjusted to optimise for summer and winter solar radiation characteristics.

PV panels that utilise tracking support structures track the movement of the sun throughout the day, to receive the maximum amount of solar irradiation.

Figure 13 Support structure for Tracking PV Panels

The **BESS** functions to store excess electricity generated by solar panels during times of low energy demand or when sunlight is abundant and release it back to the grid or the solar farm when energy demand is high or when there is insufficient sunlight. The BESS helps to optimize the PVSEF's energy output and reduce curtailment (i.e., the unused solar energy that is lost). The BESS will arrive on site pre-assembled.

The electricity generated by the solar panels is in the form of direct current (DC), but most electrical devices use alternating current (AC). **Inverters** are used to convert the DC electricity from the solar panels into AC electricity that can be used by homes and businesses. The AC electricity generated by the inverters is sent to a **transformer**, which increases the voltage of the electricity so that it can be transmitted over long distances through power lines.

The **switchgear** is used to control the flow of electricity through the PVSEF. It includes switches, fuses, and other protective devices that ensure the safe and reliable operation of the facility.

The PVSEF is equipped with a **monitoring system** that tracks the performance of the solar panels and other components in real-time. This allows operators to detect and address any issues quickly, ensuring maximum efficiency and reliability.

The electricity generated by the PVSEF is connected to the electrical grid through a **substation**, which allows the electricity to be distributed to homes and businesses in the surrounding area.

The conceptual configuration and components of the PVSEF described above are shown in Figure 14 and a summary of the details and dimensions of the planned infrastructure is provided in Table 4.

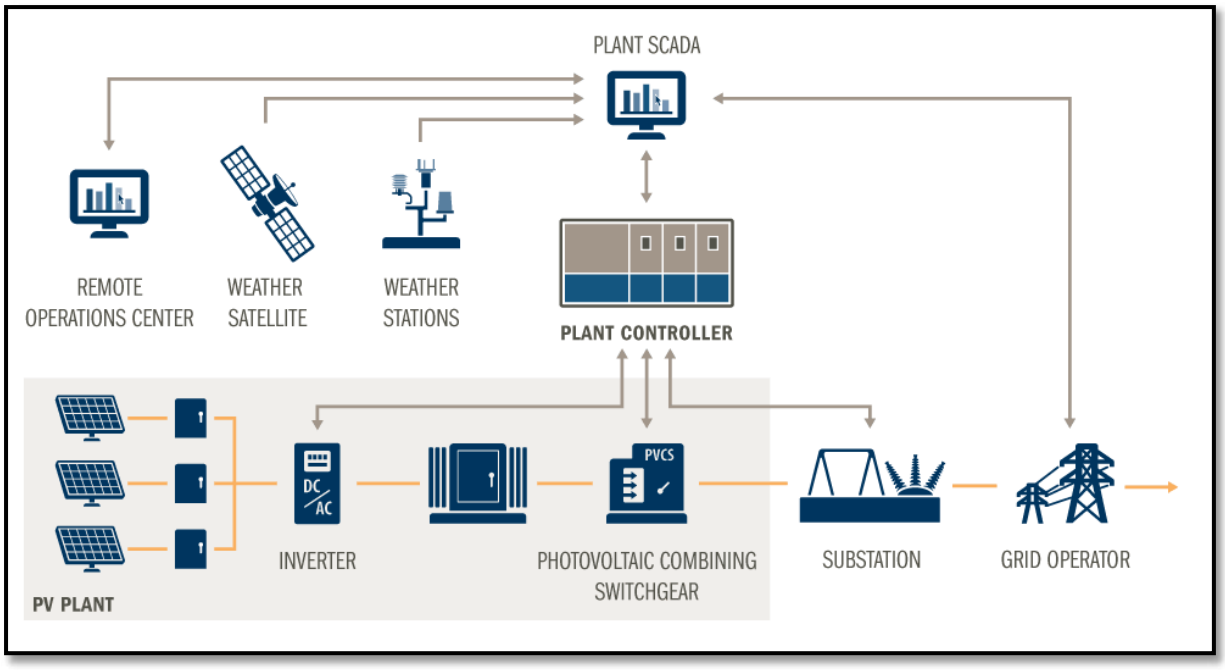


Figure 14 PVSEF Conceptual Diagram with the Various Components

Table 4 PVSEF Design Basis

INFRASTRUCTURE	DESIGN DETAILS
Contracted Generating Capacity	Up to 300MW
PV Panel Type	Bifacial solar PV modules installed on single axis tracker mounting structure at a height of up to 6m
BESS	1200 MWh with a footprint of 60,000 square m^2
Site Access Roads	8m in width
Internal Access Roads	4m in width
Paved Areas	Footprint of 3,000m^2
Fencing	Around the development area
O&M Building	Footprint of 1,500m^2
Temporary Construction Camp	Footprint of 10,000m^2
Temporary Laydown Area	40,000m^2

4.3 LISTED ACTIVITIES TRIGGERED

The approach to the Environmental Application and process for the proposed ***Activity*** is based on the provisions stipulated in section 24(5) of the National Environmental Management Act 2008 ("NEMA") No. 107 of 1998 (as amended) and the above EIA Regulations contained in Government Notice No.'s R. 326, R. 327, R. 325 and R. 324, which dictate that a Scoping and EIA environmental permitting process is to be followed.

Based on the information currently available on the proposed Project, it is anticipated that the following Listed Activities contained in **Listing Notice 1** would require a Basic Assessment process in terms of the NEMA:

GNR 327 - Listing Notice 1: Activity 11
The development of facilities or infrastructure for the transmission and distribution of electricity *-* *(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or* *(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.* *Excluding where development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is –* *(a) temporarily required to allow for maintenance of existing infrastructure;* *(b) 2 kilometres or shorter in length;* *(c) Within an existing transmission line servitude; and* *(d) Will be removed within 18 months of the commencement of development.*
The proposed development includes transformers, and underground and overhead cabling up to 33kV between project components. **This activity is triggered due to the Back-to-Back Substations (Including the facility substation Eskom collector station with feeder bays) with a contracted capacity of up to 132kV based on Eskom requirements.**

GNR 327 - Listing Notice 1: Activity 12
The development of - *(i) Dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or* *(ii) Infrastructure or structures with a physical footprint of 100 square metres or more;* ***(a) within a watercourse;*** *(b) in front of a development setback; or* ***(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;*** *excluding -* *(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such development occurs within an urban area;* *(ee) where such development occurs within existing roads, road reserves or railway line reserves; or* *(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.*
The proposed development will require the establishment of infrastructure within a physical footprint exceeding 100 square metres within a watercourse or within 32 metres of a watercourse identified in the project area.

GNR 327 - Listing Notice 1: Activity 14
The development and related operation of facilities and infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.
The development of the PVSEF will require the construction and operation of facilities and infrastructure for the storage and handling of dangerous goods (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the onsite substation and PV trackers where such storage will occur inside containers with a combined capacity exceeding 80 cubic meters but not exceeding 500 cubic meters.

GNR 327 - Listing Notice 1: Activity 19
The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; *but excluding where such infilling, depositing, dredging, excavation, removal or moving -* *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;* *(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbor; or* *(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.*
Watercourses have been identified within the development area. The construction of the Soyuz 4 Solar PV Park and associated infrastructure could require the removal of approximately 10 cubic metres of soil and rock from the wetlands.

GNR 327 - Listing Notice 1: Activity 27
The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, *except where such clearance of indigenous vegetation is required for -* (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.
The project requires removal of more 1ha of indigenous vegetation for the establishment of the solar arrays.

GNR 327 - Listing Notice 1: Activity 28
Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or* *(ii)* ***will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;*** *excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.*
Soyuz 4 Solar PV Park will have a physical footprint exceeding 1ha and occurs outside an urban area and within an area currently zoned for agriculture.

Based on the information available on the proposed Project, it is anticipated that the following Listed Activities contained in **Listing Notice 2** require a Scoping and EIA Process in terms of the NEMA:

GNR 325 - Listing Notice 2: Activity 1
The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs – (a) within an urban area; or (b) on existing infrastructure.
The Applicant has proposed to establish a PVSEF of up to 300MW.

GNR 325 - Listing Notice 2: Activity 15
The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.
More than 20 hectares of indigenous vegetation is to be cleared.

Based on the information available on the proposed Project, it is anticipated that the following Listed Activities contained in **Listing Notice 3** require a Basic Assessment Process in terms of the NEMA:

GNR 324 - Listing Notice 3: Activity 4
The development of a road wider than 4 metres with a reserve less than 13.5 metres. **g. Northern Cape** i. In an estuary; **ii. Outside urban areas:** (aa) A protected area identified in terms of NEMPAA, excluding disturbed areas; **(bb) National Protected Area Expansion Strategy Focus areas;** (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an international convention; **(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;** **(ff) Core areas in biosphere reserves;** **(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve,** excluding disturbed areas; or **(**hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or iii. Inside urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;
Access roads with dimensions wider than 4 meters with a reserve less than 13.5 metres may be required

GNR 324 - Listing Notice 3: Activity 10
The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. **g. Northern Cape** i. In an estuary; **ii. Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland;** **iii. Outside urban areas:** (aa) A protected area identified in terms of NEMPAA, excluding conservancies; **(bb) National Protected Area Expansion Strategy Focus areas;** (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an international convention; **(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;** (ff) Core areas in biosphere reserves; **(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve;** (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or (ii) Within 500 metres of an estuary; or iv. Inside urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or (cc) Within 500 metres of an estuary
The development of the PVSEF will require the construction and operation of facilities and infrastructure for the storage and handling of dangerous goods (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the onsite substation and PV trackers

GNR 324 - Listing Notice 3: Activity 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** **i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;** **ii. Within critical biodiversity areas identified in bioregional plans;** iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.
More than 300m^2 of indigenous vegetation is expected to be cleared.

GNR 324 - Listing Notice 3: Activity 14
The development of— (i) dams or weirs, where the dam or weir, including Infrastructure and water surface area exceeds 10 Square metres; or **(ii) infrastructure or structures with a physical footprint of 10 square metres or more;** **where such development occurs—** **(a) within a watercourse;** **(**b) in front of a development setback; or **(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;** excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. **g. Northern Cape** i. In an estuary; **ii. Outside urban areas:** (aa) A protected area identified in terms of NEMPAA, excluding conservancies; **(bb) National Protected Area Expansion Strategy Focus areas;** (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas identified in terms of an international convention; **(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;** (gg) Core areas in biosphere reserves; **(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;** (ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or *iii.* Inside urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or (cc) Areas seawards of the development setback line.
The physical footprint of the development will exceed 10m^2. The development is located in close proximity to watercourses

GNR 324 - Listing Notice 3: Activity 18
The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. **g. Northern Cape** i. In an estuary; **ii. Outside urban areas:** (aa) A protected area identified in terms of NEMPAA, excluding conservancies; **(bb) National Protected Area Expansion Strategy Focus areas;** (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an international convention; **(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;** (ff) Core areas in biosphere reserves; **(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;** (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or

(ii) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland; or iii. Inside urban areas: (aa) Areas zoned for use as public open space; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose
The proposed development would potentially require the expansion of existing roads.

This Application for Environmental Authorisation will be submitted to and considered by the National Department of Forestry, Fisheries and the Environment (DFFE) as the appropriate Competent Authority for the Application.

Based on the above and in terms of GN R. 326 of the NEMA EIA Regulations (2014, as amended), a **SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT PROCESS must be followed**.

5 LEGISLATIVE CONTEXT

In accordance with ***Appendix 1 Regulation 3(e) of GN No. R. 326 of the NEMA EIA Regulations (2014, as amended)****, the following information is presented in Section 5:*

i. An identification of all legislation, policies, plans and guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and have been considered in the preparation of the report

ii. How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks and instruments

This section provides an overview of the policy and legislative context within which the development of the Soyuz 4 Solar PV Park is proposed.

5.1 SOUTH AFRICAN LEGISLATION

5.1.1 National Environmental Management Act (Act No. 107 of 1998)

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended and the NEMA EIA Regulations (2014 as amended), an Application for Environmental Authorisation for certain listed activities is required to be submitted to either the Provincial Environmental Competent Authority, or the National Competent Authority (Department of Environmental Affairs, DEA),

- The current NEMA EIA regulations, GN R.326, GN R.327, GN R.325 and GN R.324, promulgated in terms of Sections 24(5), 24M and 44 of the NEMA and subsequent amendments, commenced on 08 December 2014.
- GN R.327 lists those activities for which a Basic Assessment is required,
- GN R.325 lists the activities requiring a full S&EIA and

- GN R.324 lists certain activities and competent authorities in specific identified geographical areas.
- GN R.326 defines the EIA processes that must be undertaken to apply for Environmental Authorisation (EA).

The proposed development of the Soyuz 4 Solar PV Park triggers activities listed in GNR.327, GN R.325 and GN R.324 (see section 4.3) thereby requiring a S&EIA to be undertaken to apply for the EA.

5.1.2 National Water Act (Act No. 36 of 1998)

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) is the primary legislation regulating both the use of water and the pollution of water resources. It is applied and enforced by the Department of Water and Sanitation (DWS). Section 19 of NWA regulates pollution, which is defined as "the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it:

- less fit for any beneficial purpose for which it may reasonably be expected to be used; or
- harmful or potentially harmful to;
- the welfare, health or safety of human beings;
- any aquatic or non-aquatic organisms;
- the resource quality; or
- property.

The persons held responsible for taking measures to prevent pollution from occurring, recurring or continuing include persons who own, control, occupy or use the land. This obligation or duty of care is initiated where there is any activity or process performed on the land (either presently or in the past) or any other situation which could lead or has led to the pollution of water.

The following measures are prescribed in the section 19(2) of the NWA to prevent pollution:

- cease, modify or control any act or process causing the pollution;
- comply with any prescribed standard or management practice;
- contain or prevent the movement of pollutants;
- eliminate any source of the pollution;
- remedy the effects of pollution; and
- remedy the effects of any disturbance to the bed or banks of a watercourse.

Section 21 of the NWA lists the water uses for which a water use licence (WUL) is required. In terms of the NWA, water uses include the following activities:

(a) Taking water from a water resource;
(b) Storing water;
(c) Impeding or diverting the flow of water in a watercourse;
(d) Engaging in a stream flow reduction activity contemplated in section 36;
(e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);

(f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea
(g) outfall or other conduit;
(h) Disposing of waste in a manner which may detrimentally impact on a water resource;
(i) Disposing in any manner of water which contains waste from or which has been heated in, any industrial or power generation process;
(j) Altering the bed, banks, course or characteristics of a watercourse:
(k) Removing, discharging or disposing of water found underground if it is necessary for the efficient
(l) continuation of an activity or for the safety of people; and
(m) Using water for recreational purposes.

Soyuz 4 Solar PV Park falls within the 500 m zone of regulation (ZoR) of the delineated watercourse. Authorisation in terms of GN509 of 2016 as it related to Sections 21(c) and (i) of the NWA will be required from the DWS for the proposed development.

5.1.3 National Heritage Act (Act No. 25 of 1999)

The National Heritage Resources Act (NHRA) governs the management of heritage resources which are of cultural significance. The South African Heritage Resources Agency (SAHRA) is the national body responsible for the protection of South Africa's cultural heritage resources.

Section 38(3) of the NHRA requires that all heritage resources be identified and assessed and that any comments and recommendations of the relevant heritage resources authority with regard to the proposed development have been taken into account prior to the granting of the consent.

The NHRA provides protection for the following categories of heritage resources:

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological Sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);
- Living heritage (Section 2 (d) (xxi)).

In terms of the definitions provided in Section 2 of the NHRA, heritage resources are potentially present on the Soyuz 4 Solar PV Park site.

5.1.4 National Energy Act (Act No 34 of 2008)

The National Energy Act was promulgated in 2008 (Act No 34 of 2008). One of the objectives of the Act was to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including wind:

"To ensure that diverse energy resources are available, in sustainable quantities, and at affordable prices, to the South African economy, in support of economic growth and poverty alleviation, taking into account environmental management requirements (…); to provide for (…) increased generation and consumption of renewable energies…" (Preamble)"

The Soyuz 4 Solar PV Park contributes to the diversification of the supply of energy in the form of renewable energy and therefore complies with and responds to this legislation.

5.1.5 White Paper on the Energy Policy of the Republic of South Africa

Investment in renewable energy initiatives, such as the PVSEF, is supported by the White Paper on Energy Policy for South Africa (December 1998).

In this regard, the document notes:

"Government policy is based on an understanding that renewables are energy sources in their own right, are not limited to small-scale and remote applications, and have significant medium and long-term commercial potential".

"Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future".

The support for renewable energy policy is guided by a rationale that South Africa has a very attractive range of renewable resources, particularly wind and solar and that renewable applications are in fact the least cost energy service in many cases; more so when social and environmental costs are taken into account.

Government policy on renewable energy is thus concerned with meeting the following challenges:

- Ensuring that economically feasible technologies and applications are implemented;
- Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options; and,
- Addressing constraints on the development of the renewable industry.

The White Paper acknowledges that South Africa has neglected the development and implementation of renewable energy applications, despite the fact that the country's renewable energy resource base is extensive and many appropriate applications exist.

The White Paper also notes that renewable energy applications have specific characteristics that need to be considered.

Advantages include:

- Minimal environmental impacts in operation in comparison with traditional supply technologies; and
- Generally lower running costs, and high labour intensities.

Disadvantages include:

- Higher capital costs in some cases;
- Lower energy densities; and
- Lower levels of availability, depending on specific conditions, especially with sun and wind-based systems.

The IRP 2010[6] also allocates 43% of new energy generation facilities in South Africa to renewables.

5.1.6 White Paper on Renewable Energy

The White Paper on Renewable Energy (November 2003) (further referred to as the White Paper) supplements the White Paper on Energy Policy (see Section 5.1.5), which recognizes that the medium and long-term potential of renewable energy is significant. This Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa. The Soyuz 4 Solar PV Park aligns with this vision and falls squarely within the goals and objectives laid out in the White Paper on Renewable Energy.

The White Paper notes that while South Africa is well-endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped. As signatory to the Kyoto Protocol[7] , Government is determined to make good the country's commitment to reducing greenhouse gas emissions. To this purpose, Government has committed itself to the development of a framework in which a national renewable energy framework can be established and operate.

South Africa is also a signatory of the Copenhagen Accord, a document that delegates at the 15th session of the Conference of Parties (COP 15) to the United Nations Framework Convention on Climate Change agreed to "take note of" at the final plenary on 18 December 2009. The accord endorses the continuation of the Kyoto Protocol and confirms that climate change is one of the greatest challenges facing the world. In terms of the accord South Africa committed itself to a reduction target of 34% compared to business as usual.

Apart from the reduction of greenhouse gas emissions (GHG), the promotion of renewable energy sources is aimed at ensuring energy security through the diversification of supply (in this regard, also refer to the objectives of the National Energy Act).

Government's long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidized alternative to fossil fuels. The medium-term (10-year) target set in the White Paper is:

10 000GWh[8] renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilised for power generation and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1667MW) of the projected electricity demand for 2013 (41539MW) (Executive Summary, ix).

6 *Integrated Resource Plan (IRP) for South Africa 2010 - 2030*

7 *The Kyoto Protocol is a protocol to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at fighting global warming. The UNFCCC is an international environmental treaty with the goal of achieving "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[The Protocol was initially adopted on 11 December 1997 in Kyoto, Japan and entered into force on 16 February 2005. As of November 2009, 187 states have signed and ratified the protocol (Wikipedia)*

8 *Gigawatt hours, abbreviated as GWh, is a unit of energy representing one billion (1 000 000 000) watt hours and is equivalent to one million kilowatt hours. A kilowatt hour is equivalent to a steady power of one kilowatt running for one hour and is equivalent to 3.6 million joules or 3.6 megajoules.*

5.1.7 National Integrated Resource Plan for Electricity (2010-2030)

South Africa's National Development Plan (NDP) 2030 offers a long-term plan for the country. It defines a desired destination where inequality and unemployment are reduced, and poverty is eliminated so that all South Africans can attain a decent standard of living. Electricity is one of the core elements of a decent standard of living and therefore the proposed development of the Soyuz 4 Solar PV Park is in alignment with the NDP. In formulating its vision for the energy sector, the NDP took as a point of departure the Integrated Resource Plan (IRP) 2010–2030 (see 5.1.7) promulgated in March 2011. The IRP is an electricity infrastructure development plan based on least-cost electricity supply and demand balance, taking into account security of supply and the environment (minimize negative emissions and water usage).

The IRP notes that South Africa is a signatory to the Paris Agreement on Climate Change and has ratified the agreement. The energy sector contributes close to 80% towards the country's total Green House Gas (GHG) emissions of which 50% are from electricity generation and liquid fuel production alone. A transition from a fossil fuel-based energy sources is therefore critical to reducing GHG emissions.

In terms of IRP (2019) provision has been made for the following new additional capacity by 2030:

- 1 500MW of coal
- 2 500MW of hydro
- 6 000MW of solar PV
- 14 400MW of wind
- 1 860MW of nuclear
- 2 088MW for storage
- 3 000MW of gas/diesel
- 4 000MW from other distributed generation, co-generation, biomass and landfill technologies.

As indicated in Figure 15, capacity allocations see an increase in solar PV and wind, and a significant decrease in gas and diesel; and new inclusions include nuclear and storage.

	Coal	Coal (Decommis-sioning)	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas & Diesel	Other (Distributed Generation, CoGen, Biomass, Landfill)
Current Base	37,149		1 860	2,100	2 912	1 474	1 980	300	3 830	499
2019	2,155	-2,373					244	300		Allocation to the extent of the short term capacity and energy gap.
2020	1,433	-557				114	300			
2021	1,433	-1403				300	818			
2022	711	-844			513	400 1,000	1,600			
2023	750	-555				1000	1,600			500
2024			1,860				1,600		1000	500
2025						1000	1,600			500
2026		-1,219					1,600			500
2027	750	-847					1,600		2000	500
2028		-475				1000	1,600			500
2029		-1,694			1575	1000	1,600			500
2030		-1,050		2,500		1000	1,600			500
TOTAL INSTALLED CAPACITY by 2030 (MW)	33,364		1,860	4,600	5,000	8,288	17,742	600	6,380	
% Total Installed Capacity (% of MW)	43		2.36	5.84	6.35	10.52	22.53	0.76	8.1	
% Annual Energy Contribution (% of MWh)	58.8		4.5	8.4	1.2*	6.3	17.8	0.6	1.3	

Installed Capacity
Committed/Already Contracted Capacity
Capacity Decommissioned
New Additional Capacity
Extension of Koeberg Plant Design Life
Includes Distributed Generation Capacity for own use

- 2030 Coal Installed Capacity is less capacity decommissioned between years 2020 and 2030.
- Koeberg power station rated/installed capacity will revert to 1,926MW (original design capacity) following design life extension work.
- Other/ Distributed generation includes all generation facilities in circumstances in which the facility is operated solely to supply electricity to an end-use customer within the same property with the facility.
- Short term capacity gap is estimated at 2,000MW.

Figure 15 Summary of energy allocations and commitments based on the 2019 IRP

5.1.8 National Development Plan

The National Development Plan (NDP) contains a plan aimed at eliminating poverty and reducing inequality by 2030. The NDP identifies 9 key challenges and associated remedial plans. Managing the transition towards a low carbon national economy is identified as one of the 9 key national challenges. Expansion and acceleration of commercial renewable energy is identified as a key intervention strategy.

The Plan aims to address poverty and exclusion whilst simultaneously attempting to nurture economic growth. It works to achieve this by creating a cycle of expanding opportunities, capacity building, poverty reduction, community integration and upliftment and involvement, which all contribute to better living standards.

5.1.9 The New Growth Path Framework

Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's main target is to create five million jobs over the next 10 years to reflect government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard, the framework identifies investments in

five key areas namely: energy, transport, communication, water and housing. As an energy project, the Soyuz 4 Solar PV Park aligns well with this framework.

The New Growth Path also identifies five other priority areas as part of the programme to create jobs, through a series of partnerships between the State and the private sector. The Green Economy is one of the five priority areas, including expansions in construction and the production of technologies for solar, wind and biofuels. In this regard, clean manufacturing and environmental services are projected to create 300 000 jobs over the next decade.

The renewable energy sector can make a substantial contribution towards meeting the need for job creation through manufacturing, operation management of renewable energy plants and materials, and maintenance.

5.1.10 National Infrastructure Plan

The South African Government adopted a National Infrastructure Plan in 2012. The aim of the plan is to transform the economic landscape while simultaneously creating significant numbers of new jobs and strengthen the delivery of basic services. The plan also supports the integration of African economies.

These investments will improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. On the other hand, investment in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to faster economic growth.

5.2 PROVINCIAL LEVEL POLICY AND PLANNING

5.2.1 Northern Cape Province Provincial Growth and Development Strategy

The Northern Cape Provincial Growth and Development Strategy (NCPGDS) identifies poverty reduction as the most significant challenge facing the government and its partners. All other societal challenges that the province faces emanate predominantly from the effects of poverty. The NCPGDS notes that the only effective way to reduce poverty is through long-term sustainable economic growth and development.

The sectors where economic growth and development can be promoted include:

- Agriculture and Agro processing
- Fishing and Mariculture
- Mining and mineral processing
- Transport
- Manufacturing
- Tourism

However, the NCPGDS also notes that economic development in these sectors also requires:

- Creating opportunities for lifelong learning
- Improving the skills of the labour force to increase productivity
- Increasing accessibility to knowledge and information

The achievement of these primary development objectives depends on the achievement of a number of related objectives that, at a macro-level, describe necessary conditions for growth and development.

These are:

- Developing requisite levels of human and social capital
- Improving the efficiency and effectiveness of governance and other development institutions
- Enhancing infrastructure for economic growth and social development

The NCPGDS makes reference to the need to ensure the availability of inexpensive energy. In order to promote economic growth in the Northern Cape, the availability of electricity to key industrial users at critical localities at rates that enhance the competitiveness of their industries must be ensured. At the same time, the development of new sources of energy through the promotion of the adoption of energy applications that display a synergy with the province's natural resource endowments must be encouraged.

In this regard the NCPGDS notes "the development of energy sources such as solar 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". The NCPGDS also highlights the importance of close co-operation between the public and private sectors in order for the economic development potential of the Northern Cape to be realised.

The NCPGDS highlights the importance of enterprise development and notes that the current level of private sector development and investment in the Northern Cape are low. In addition, the province also lags in the key policy priority areas of SMME Development and Black Economic Empowerment. The proposed solar energy facility therefore has the potential to create opportunities to promote private sector investment and the development of SMMEs in the Northern Cape Province.

In this regard, care will need to be taken to ensure that the proposed development and associated renewable energy facilities do not negatively impact on the regions natural environment. In this regard, the NCPGDS notes that the sustainable utilisation of the natural resource base on which agriculture depends is critical in the Northern Cape with its fragile eco-systems and vulnerability to climatic variation. The document also indicates that due to the provinces exceptional natural and cultural attributes, it has the potential to become the preferred adventure and ecotourism destination in South Africa.

5.2.2 Northern Cape Provincial Spatial Development Framework

Northern Cape Provincial Spatial Development Framework (NCSDF) (2012) lists a number of sectoral strategies and plans that are to be read and treated as key components of the Provincial Spatial Development Framework (PSDF). Of these there are a number that are relevant to the proposed development, including:

- **Sectoral Strategy 1**: Provincial Growth and Development Strategy of the Provincial Government.
- **Sectoral Strategy 2:** Comprehensive Growth and Development Programme of the Department of Agriculture, Land Reform and Rural Development.

- **Sectoral Strategy 5:** Local Economic Development (LED) Strategy of the Department of Economic Development and Tourism.
- **Sectoral Strategy 11:** Small Micro Medium Enterprises (SMME) Development Strategy of the Department of Economic Development and Tourism.
- **Sectoral Strategy 12:** Tourism Strategy of the Department of Economic Development and Tourism.
- **Sectoral Strategy 19:** Provincial renewable energy strategy (to be facilitated by the Department of Economic Development and Tourism).

The energy objectives for the Northern Cape Province makes specific reference to renewable energy. Of relevance the objectives include:

- **Promote the development of renewable energy supply schemes**. Large-scale renewable energy supply schemes are strategically important for increasing the diversity of domestic energy supplies and avoiding energy imports while minimizing detrimental environmental impacts.
- **Develop and institute innovative new energy technologies to improve access to reliable, sustainable, and affordable energy services with the objective to realize sustainable economic growth and development.** The goals of securing supply, providing energy services, tackling climate change, avoiding air pollution, and reaching sustainable development in the province offer both opportunities and synergies which require joint planning between local and provincial government as well as the private sector.
- **Develop and institute energy supply schemes with the aim to contribute to the achievement of the targets set by the White Paper on Renewable Energy (2003)**.

The policy guidelines for the development of the energy sector make specific reference to the renewable energy sector.

- The construction of telecommunication infrastructure must be strictly regulated in terms of the spatial plans and guidelines put forward in the PSDF. They must be carefully placed to avoid visual impacts on landscapes of significant symbolic, aesthetic, cultural or historic value and should blend in with the surrounding environment to the extent possible.
- EIAs undertaken for such construction must assess the impacts of such activities against the directives listed in (a) above.
- **Renewable energy sources such as wind, solar, thermal, biomass and domestic hydroelectricity are to constitute 25% of the province's energy generation capacity by 2020.**
- The following key policy principles for renewable energy apply.
    - Full cost accounting: Pricing policies will be based on an assessment of the full economic, social and environmental costs and benefits of energy production and utilisation.
    - Equity: There should be equitable access to basic services to meet human needs and ensure human well-being. Each generation has a duty to avoid impairing the ability of future generations to ensure their own well-being.
    - Global and international cooperation and responsibilities: Government recognises its shared responsibility for global and regional issues and act with due regard to the principles contained in relevant policies and applicable regional and international agreements.

- Allocation of functions: Government will allocate functions within the framework of the Constitution to competent institutions and spheres of government that can most effectively achieve the objectives of the energy policy.
- **The implementation of sustainable renewable energy is to be promoted through appropriate financial and fiscal instruments.**
- **An effective legislative system to promote the implementation of renewable energy is to be developed, implemented, and continuously improved.**
- **Public awareness of the benefits and opportunities of renewable energy must be promoted.**
- **The development of renewable energy systems is to be harnessed as a mechanism for economic development throughout the province i**n accordance with the Sustainable Development Initiative (SDI) approach or any comparable approach.
- Renewable energy must, first, and foremost, be used to address the needs of the province before being exported.

The overall energy objective for the province also includes promoting the development of renewable energy supply schemes which are strategically important for increasing the diversity of domestic energy supply and avoiding energy impacts, while also minimising the detrimental environmental impacts. The implementation of sustainable renewable energy is also to be promoted within the province through appropriate financial and fiscal instruments.

The development of the Soyuz 4 Solar PV Park supports the overall energy objective of the province to have 25% of its electricity from renewable energy sources.

5.2.3 Northern Cape Provincial Spatial Development Framework (SDF) 2018

The Northern Cape PSDF (2018) refers to infrastructure investment and that a balance must be made and maintained between investments aimed at meeting the social needs of communities and investments and investment aimed to promote economic development and job creation.

The SDF strategy referred to in the PSDF for infrastructure includes achieving the provision of green infrastructure which includes renewable energy. The 2040 Vision of the PSDF identifies key opportunities for the Northern Cape. These include the strengthening of the development triangle that is formed by the linking of Kimberly, Vryburg, Upington and De Aar. The development triangle sustains a diverse economy with strong mining, agricultural, and renewable energy sectors. The PSDF states that a sustainable and viable economic network must be pursued within the development triangle with the purpose of improving the return of public investment in the province.

The development at the Soyuz 4 Solar PV Park will contribute to the economic network of the province specifically in terms of the renewable sector in general.

5.2.4 Northern Cape Climate Change Response Strategy

The Northern Cape Provincial Government (NCPG) is committed to development in accordance with the National Green Paper for National Climate Change Response Strategy (2010) and acknowledges the Northern Cape Province's extreme vulnerability to climate change driven desertification.

The development of provincial green economy which includes green jobs and environmental learnership programmes are important provincial projects that will address climate change. The

renewable energy sector is a key element in meeting and addressing the Provincial Climate Change Response Strategy. **The development of the Soyuz 4 Solar PV Soyuz 4 Park will contribute to meeting the promotion of provincial green economy within the Northern Cape.**

5.2.5 The Northern Cape Province Green Document

The Northern Cape occupies a central position in the global debate regarding the renewable energy contribution in South Africa . The province locality has resulted in investment into renewable energy and to date the province hosts 59 of South Africans 112 independent power producers. 23 of these projects are already connected to the grid at a capacity of over 1500MW. The Northern Cape has the potential to generate energy by means of Concentrated Solar Panels (CSP), Photovoltaic (PV) and wind energy.

The NCP Green Document (2017-2018) was prepared by the Northern Cape Department of Economic Development and Tourism. The report assesses the impact of Independent Power Producers (IPPs) on the community level, especially those communities located within 50km of the existing facilities. The document alludes to the fact that the NCP is the overall leader of commercial scale renewable energy projects within the province.

The goal is that by 2018, 23 IPP projects will have been integrated into the national grid, this has already been achieved. The renewable energy projects are recognised as significant forms of development for addressing energy demands in the Country. These projects include Solar PV, concentrated solar and wind farms. Existing projects of this nature have already made significant positive impacts due to their economic development requirements and obligations. Job creation, education and economic surplus are significant contributions by these projects. Considering the life span of these projects (20 years), the future socio-economic potential for upliftment and contribution is significant.

5.3 DISTRICT AND LOCAL POLICY AND PLANNING ENVIRONMENT

The local spheres and levels of government relevant to the Soyuz 4 Solar PV Park are the Pixley Ka Seme District Municipality (PKSDM) and the Emthanjeni Local Municipality. The policies and goals outlined in the policy documents of the above municipalities align with the development of the proposed PVSEF, with specific relation to job creation, economic growth and poverty alleviation through community upliftment and resilience building.

5.3.1 Pixley ka Seme District Municipality Integrated Development Plan (2020)

The vision of the PKSDM is a “Developed and Sustainable District for Future Generations”. The PKSDM aims to achieve this by various objectives which include: supporting the local municipality to create a home for all in the town, settlement and rural areas and to ensure services are rendered to these areas; to provide political and administrative leadership and direction regarding development planning processes; promoting economic growth that is shared across and within communities; promoting integrated development planning in the operations of the municipality; aligning development initiatives in the district to the NDP.

The strategic objectives which are outlined in the IDP and which are relevant to the proposed development are: economic growth in the district regarding service delivery. The IDP notes that growth and development in PKSDM are defined by high levels of poverty and education; low levels of

development; high unemployment rates and a vulnerability towards climate change impacts. The IDP recognises the potential for renewable energy to address the challenges mentioned above. The IDP notes that the economy in the Pixley ka Seme municipal area is characterized by:

- High levels of poverty and low levels of education.
- Low levels of development despite the strategic location in terms of the national transport corridors.
- High rate of unemployment, poverty and social grant dependence.
- Prone to significant environmental changes owing to long-term structural changes (such as climate change, energy crises and other shifts).

Of specific relevance the IDP highlights the potential for renewable energy to help address some of these challenges. **The development of the proposed Soyuz 4 Solar PV Park will help to meet these needs and address these challenges and to do so in an environmentally sustainable manner.**

5.3.2 Pixley ka Seme District Municipality Spatial Development Framework (SDF) (2017)

The SDF notes that the vision for the PKSDM is "*Pixley Ka Seme District Municipality, pioneers of development, a home and future for all"*.

The Mission Statement that underpins the vision refers to:

- Effective and efficient service delivery.
- Optimal human and natural resource development.
- Local economic growth and development, job creation and poverty alleviation.
- A vibrant tourism industry.
- To participate in the fight to reduce the infection rate and lessen the impact of HIV/ Aids and other communicable diseases.
- A safe, secure and community friendly environment.

The SDF identifies the opportunities and constraints associated with the district. Of relevance to the project the opportunities include:

Renewable Energy and the identification of a renewable energy hub in the region. The natural environment and maintenance and conservation of the pristine natural environment to support sustainable farming into the future is also identified as an opportunity. The SDF notes that Pixley Ka Seme District area with its abundance of sunshine and vast tracts of available land has attracted considerable interest from solar energy investors. The high solar index of the area provides many opportunities in terms of the development of renewable energy. This has been acknowledged by the Northern Cape Government with the identification of the Renewable Energy Hub. The areas around the northern and eastern borders of the Pixley Ka Seme District Municipality form part of this hub with the potential to stimulate special economic development zoned within the area that have the potential to stimulate industrial development.

The PKSDM also falls within the **Solar Development Corridor** as identified in the Northern Cape Provincial Spatial Development Framework. The corridor extends from Kakamas to Upington and down to De Aar in the south-east (Figure 16). The SDF also refers to the establishment of a **Renewable**

Energy Hub proposed for the Northern Cape stretching from the west coast right up to the De Aar region (Figure 17). The Hub can accommodate special economic development within the zone as earmarked and entails a 100km wide zone.

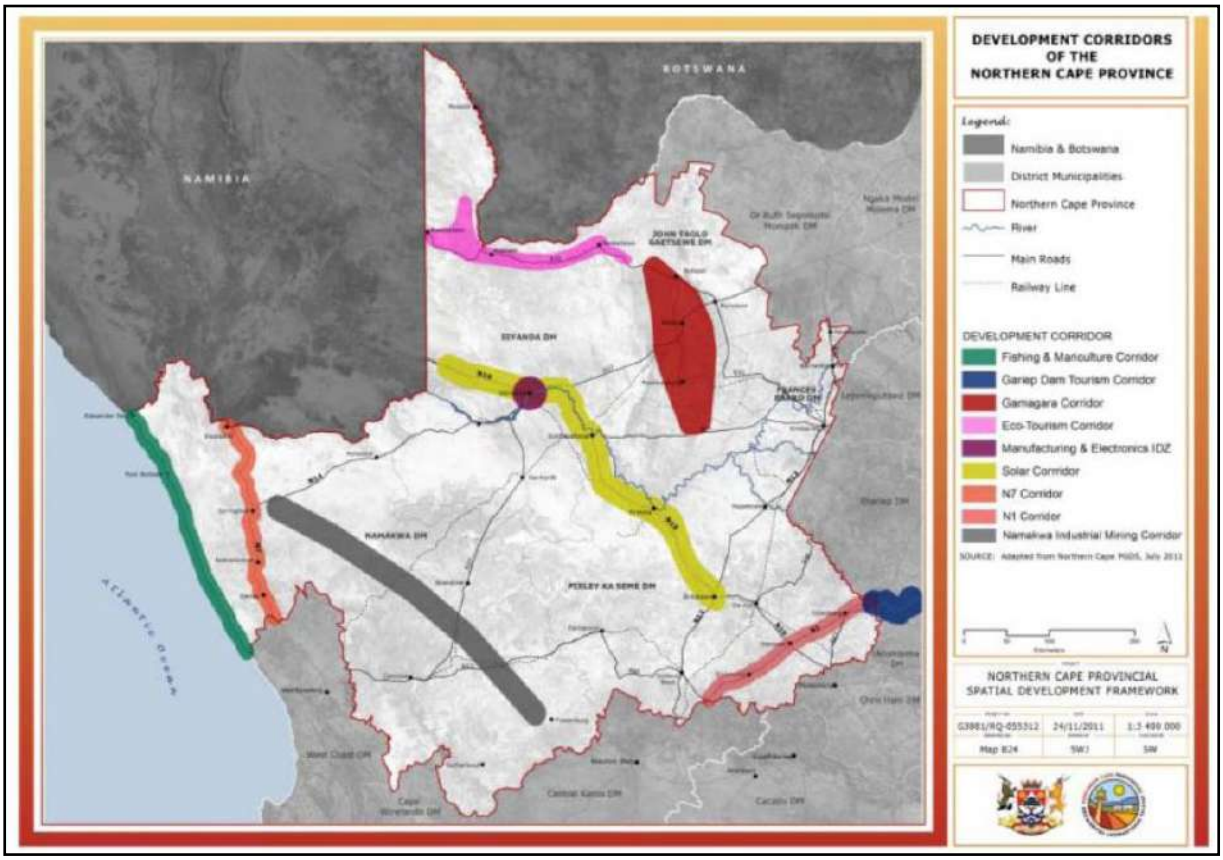


Figure 16 Northern Cape Development Corridors-Solar Corridor (yellow)

The SDF notes that the area is known for its clean air and open skies with limited light pollution. Potential visual impacts are therefore an issue that needs to be considered. In this regard the SDF notes that the topography of Pixley Ka Seme region is one of its main assets with vast open spaces and unspoilt panoramic visual vistas stretching over great distances. This asset makes for excellent scenic drives throughout the whole of the region from the flat plains to crossing the main rivers of South Africa. Visual vistas, ridges and "koppies" are assets within the region and they must be handled with sensitivity.

The relevant constraints include high levels of poverty and unemployment, backlog in basic services, including electricity and housing in rural areas, the limited supply of water and overall scarcity of water in the region to support economic development.

The development challenges that face the PKSDM include high unemployment and poverty rates and low income which are placing increasing demand on service delivery because very few people are able to pay for services. Declining population numbers, and alcohol and substance abuse are also key challenges.

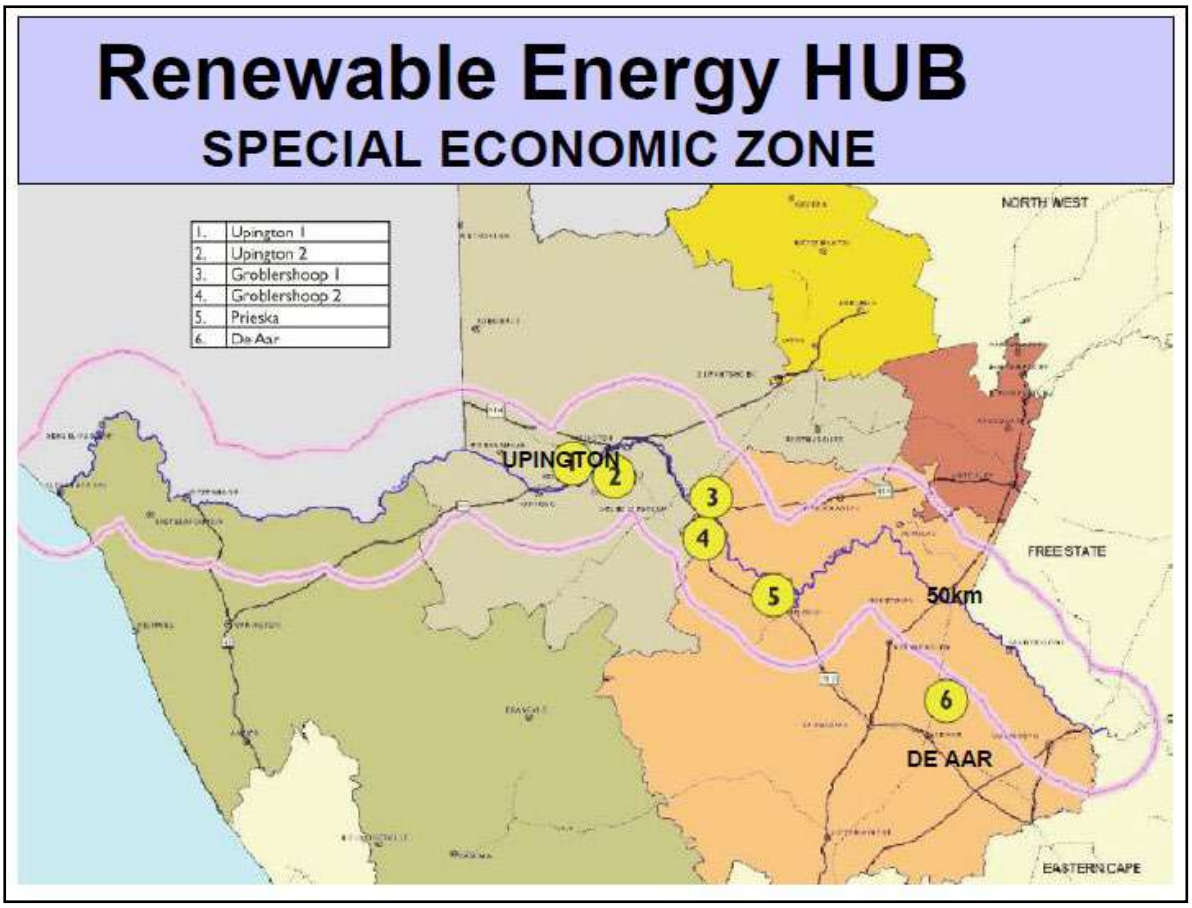


Figure 17 Northern Cape Renewable Energy Hub[9]

In terms of services, inadequate schools in farming areas results in children having to travel long distances to areas where the go to school. There are also insufficient health centres and lack of amenities and recreational services. Where these services do exist, they are often poorly managed and maintained. The level of key services, such as refuse removal, are also low, while many rural and a number of urban households rely on boreholes for their water supply.

Climate change is also identified as a key risk. The SDF notes that the Karoo is predicted to experience more drought periods, coupled with increased evaporation and temperatures and this will negatively impact already restricted water supply. It is likely that the greatest impacts will be on water supply.

The SDF identifies that there are various opportunities and challenges associated with the realisation of the PKSDM vision. **Soyuz 4 Solar PV Park links directly to job creation, economic development and community upliftment and presents an opportunity to help overcome and address the above-mentioned issues.**

5.3.3 Emthanjeni Local Municipality Integrated Development Plan (IDP) (2022)

The Emthanjeni Local Municipality (ELM) is a category B municipality consisting of three towns, namely, De Aar, Britstown and Hanover. The vision of the ELM is *"Leading sustainable development for inclusive economic growth"*. The mission statement linked to the vision is *"To create a viable economic development plan that is relevant to the characteristics of the Emthanjeni Municipal area,*

[9] *Source: Northern PKSDM SDF*

designed to create and maintain a sound and healthy local economy, drawing upon local strengths and resources. This will be achieved through:

- Strategic partnerships and collaboration
- Effective stakeholder communications
- Supporting existing businesses and encourage the expansion and repositioning of desirable commercial and industrial uses
- To increase the number of farms or agricultural land in the community

The IDP refers to the national economic pillars adopted on the National Framework for Local Economic Development in South Africa which launched in 2014. The pillars are aligned to the main thrusts and opportunities within ELM to ensure an integrated approach for optimal rate of implementation and economic development in the municipality. The five pillars are:

- Pillar 1: Building a Diverse Economic Base
- Pillar 2: Developing learning and skilful economies
- Pillar 3: Developing Inclusive Economies
- Pillar 4: Enterprise Development and Support
- Pillar 5: Economic Governance and Infrastructure

Pillars 1, 2, 3 and 4 are relevant to the proposed development

Pillar 1: Building a Diverse Economic Base

The first pillar focuses on building a diverse economic base and growing the local economy through industrial and sector-specific (e.g., Tourism, Mining, Agriculture, Manufacturing, etc.).

Pillar 2: Developing learning and skilful economies

The IDP notes that addressing the skills gap and improving skills levels is critical to the to the successful implementation of all the other pillars, as increased skills lead to increased opportunities for stimulating local economies.

Pillar 3: Developing Inclusive Economies

Creating decent work and sustainable livelihoods improves the living standards and ensures a dignified existence for individuals.

Pillar 4: Enterprise Development and Support

The IDP highlights the importance of supporting economic development and creating a diverse economic sector. The need to support SMMEs is also noted.

The development of the PVSEF will support these pillars. The IDP also lists 7 Key Performance Areas (KPAs) of which KPA 1: Basic Services and Infrastructure Development, KPA 5: Local Economic Development and KPA 7: Social Development, are relevant to the project.

The IDP highlights the importance to the renewable energy sector and refers to a number of IPP projects located in the ELM and PKSDM.

The proposed Soyuz 4 Solar PV Park can contribute to five of the above objectives such as economic development, infrastructure development, health services (through economic growth), SMME development, and skills development.

5.4 KEY AUTHORITIES FOR THE ENVIRONMENTAL APPLICATION

Based on the associated legislations that this Project triggers, the following Competent Authorities will form the key decision makers for the Project at a **District** and **National** Level:

Department of Mineral Resources and Energy (DMRE): This Department is responsible for policy relating to all energy forms and for compiling and approving the Integrated Resources Plan (IRP) for electricity. Furthermore, the Department is responsible for approvals for the use of land that is contrary to the objects of the Mineral and Petroleum Resource Development Act (Act No. 28 of 2002) (MPRDA) in terms of Section 52 of the Act. Therefore, in terms of the Act, approval from the Minister is required to ensure that proposed activities do not sterilise potential mineral resources that may occur within the project site and development area.

National Energy regulator of South Africa (NERSA): NERSA is responsible for Regulating all aspects of the electricity sector and will issue licenses for IPP projects to generate electricity.

Department of Forestry, Fisheries, and the Environment (DFFE): DFFE is responsible for environmental policy and is the controlling authority in terms of NEMA and the EIA Regulations, 2014 (GNR 326) as amended. DEA is the Competent Authority for this project (GN R779 of 2016) and is charged with granting the EA for the project under consideration.

The South Africa Heritage Resources Agency (SAHRA): SAHRA is a statutory organisation established under the National Heritage Resources Act (No. 25 of 1999). NHRA is responsible for the protection of South Africa's cultural heritage.

South African National Roads Agency Limited (SANRAL): This Agency is responsible for the regulation and maintenance of all national road routes.

Department of Water and Sanitation (DWS): This Department is responsible for effective and efficient water resource management to ensure sustainable economic and social development. This Department is also responsible for evaluating and issuing licenses pertaining to water use (Water Use Licenses (WUL) and General Authorisations).

The Department of Agriculture, Rural Development and Land Reform (DARDLR): This Department is the custodian of South Africa's agricultural resources and is primarily responsible for the formulation and implementation of policies governing the agricultural sector, Furthermore, the Department is responsible for issuing permits for the disturbance or destruction of protected tree species listed under Section 15(1) of the National Forest Act (No. 84 of 1998) (NFA).

National Environmental Management Act EIA Regulations (2014 as amended) Environmental Application – The National Department of Environmental Affairs (DEA)

The EAP confirms that based on the associated legislations that this Project triggers, the following Competent Authorities will form the key decision makers for the Project at a **Provincial** and **Local** Level:

Provincial Government of the Northern Cape – Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARD&LR): This Department is the commenting authority of the EIA process for the project and is responsible for issuing of biodiversity and conservation related permits.

Northern Cape Department of Transport, Safety and Liaison: This Department provides effective coordination of crime prevention initiatives, provincial police oversight, traffic management and road safety towards a more secure environment.

Ngwao-Boswa Ya Kapa Bokone (NBKB): This department identifies, conserves and manages heritage resources throughout the Northern Cape Province.

Emthanjeni Local Municipality (ELM): The Municipality provides important documentation (IDP) which assist the CA in determining the approval of a project.

Pixley Ka Seme District Municipality (PKSDM): PKSDM are responsible for providing provincial and district level guiding documentation and support.

5.5 INTERNATIONAL CONVENTIONS AND AGREEMENTS

The International Conventions and Agreements[10] that have bearing on the proposed development of the Soyuz Solar PV Park Cluster 1-6 and to which South Africa is a signatory are summarised in Table 5. South Africa is a signatory to all

Table 5 International Conventions and Agreements

CONVENTION	SUMMARY OF OBJECTIVES APPLICABLE
Convention on Biological Diversity (29 December 1993)	Develop strategies, plans or programs for conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programs which shall reflect, inter alia, the measures set out in this Convention.
Convention on Wetlands of International Importance (Ramsar) (21 December 1975)	To stem the progressive encroachment and loss of wetlands now and in the future.
United Nations Framework Convention on Climate Change - Kyoto Protocol (23 February 2005)	To further reduce greenhouse gas emissions by enhancing the national programs of developed countries aimed at this goal and by establishing percentage reduction targets for the developed countries and through the clean development mechanism (CDM) (where developed countries can invest in developing country clean technology to offset emissions).

[10] *Sources: United States Central Intelligence Agency World Fact book (https://www.cia.gov/the-world-factbook/)*

CONVENTION	SUMMARY OF OBJECTIVES APPLICABLE
Montreal Protocol on Substances That Deplete the Ozone Layer (1 January 1989)	Calculated levels of consumption and production of CFCs must not exceed the stipulated thresholds.
United Nations Convention to Combat Desertification (26 December 1996)	To combat desertification and mitigate the effects of drought through national action programs.
United Nations Framework Convention on Climate Change (21 March 1994)	Protection of the climate system: Operations must protect the climate system by controlling greenhouse gases not controlled by the Montreal Protocol, which cause climate change through anthropogenic interference with the climate system.
Stockholm Convention on Persistent Organic Pollutants (POPs) (17 May 2004)	This convention seeks to ban the production and use of persistent organic chemicals but allow the use of some of these banned substances, such as DDT, for vector control.
The Fourth ACP-EEC Convention 15 December 1989 (Lome)	Control of hazardous and radioactive waste: the operation must be aware that international law emphasizes strict control of hazardous waste and compliance with domestic legislation in this regard. It also seeks to prohibit imports and exports of such substances.
Convention concerning the Protection of the World Cultural and Natural Heritage 1972 (Paris)	Ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (24 February 2004)	Promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm

5.6 INTERNATIONAL FINANCE CORPORATION PERFORMANCE STANDARDS

The Applicant is committed to complying with the International Finance Corporation (IFC) Performance Standards (PS) on social and environmental sustainability. These were developed by the IFC and were last updated on 1st January 2012 (refer to Figure 18).

The overall objectives of the IFC PS are:

- To fight poverty;
- To do no harm to people or the environment;
- To fight climate change by promoting low carbon development;
- To respect human rights;
- To promote gender equity;
- To provide information prior to project development, free of charge and free of external manipulation;
- To collaborate with the project developer to achieve the PS;
- To provide advisory services; and
- To notify countries of any Transboundary impacts as a result of a Project.

The PS comprise of eight performance standards namely:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and
- Impacts;
- Performance Standard 2: Labour and Working Conditions;
- Performance Standard 3: Resource Efficiency and Pollution Prevention;
- Performance Standard 4: Community Health, Safety and Security;
- Performance Standard 5: Land Acquisition and Involuntary Resettlement;
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
- Performance Standard 7: Indigenous Peoples; and
- Performance Standard 8: Cultural Heritage.

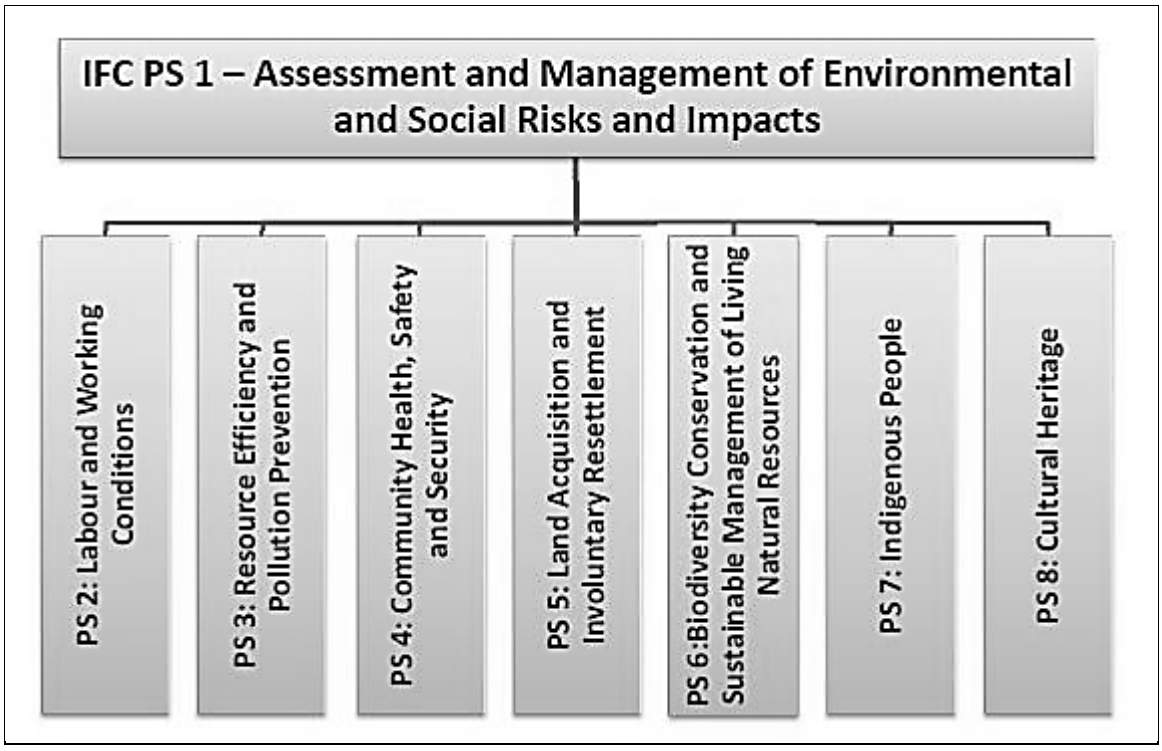


Figure 18 IFC PS Framework[11]

Performance Standard 1 establishes the importance of:

(i) integrated assessment to identify the social and environmental impacts, risks, and opportunities of projects;
(ii) effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them; and
(iii) the management of social and environmental performance throughout the life of a project through an effective Environmental and Social Management System (ESMS).

PS 1 is the overarching standard to which all the other standards relate. The ESMS should be designed to incorporate the aspects of PS 2 to 8 as applicable.

[11] *Extracted from the International Finance Corporation (IFC) Performance Standards (PS)*

Performance Standards 2 through to 8 establish specific requirements to avoid, reduce, mitigate or compensate for impacts on people and the environment, and to improve conditions where appropriate. While all relevant social and environmental risks and potential impacts should be considered as part of the assessment, Performance Standards 2 through 8 describe potential social and environmental impacts that require particular attention in emerging markets. Where social or environmental impacts are anticipated, the developer is required to manage them through its Social and Environmental Management System consistent with Performance Standard 1.

5.6.1 Equator Principles

The Equator Principles (EPs) is a credit risk management framework for determining, assessing and managing environmental and social risk in Project Finance transactions. Project Finance is often used to fund the development and construction of major infrastructure and industrial projects. The EPs are adopted by financial institutions and are applied where total project capital costs exceed US$10 million. The EPs are primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making.

The EPs are based on the IFC PS 2012 and on the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines).

The Equator Principles Financial Institutions (EPFIs) have consequently adopted these Principles in order to ensure that the projects they finance are developed in a manner that is socially responsible and reflect sound environmental management practices.

EPFIs will only provide loans to projects that conform to the following principles:

- Principle 1: Review and Categorisation;
- Principle 2: Social and Environmental Assessment;
- Principle 3: Applicable Social and Environmental Standards;
- Principle 4: Action plan and Management;
- Principle 5: Consultation and Disclosure;
- Principle 6: Grievance Mechanism;
- Principle 7: Independent review;
- Principle 8: Covenants;
- Principle 9: Independent Monitoring and Reporting; and
- Principle 10: EPFI Reporting

5.6.2 The World Bank Group Environmental Health and Safety EHS) Guidelines

The EHS Guidelines (World Bank Group, 2007) are technical reference documents with general and industry specific (i.e. mining) examples of Good International Industry Practice (GIIP). Reference to the EHS guidelines is required under IFC PS 3.

The EHS Guidelines contain the performance levels and measures normally acceptable to the IFC and are generally considered to be achievable in new facilities at reasonable cost. When host country regulations differ from the levels and measures presented in the EHS Guidelines, Projects are expected to achieve whichever standard is more stringent.

This Scoping Report is broadly aligned with the various International Standards summarised above.

6 MOTIVATION FOR NEED AND DESIRABILITY FOR PROPOSED ACTIVITY

This section outlines the purpose of considering the activity's "need" and "desirability" in accordance with the National Environmental Management Principles in terms of NEMA which serve as a guide for the interpretation, administration and implementation of NEMA and the NEMA EIA regulations (2014 as amended). Overall, the development of renewable energy is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all refer to and support renewable energy. The PKSDM SDF and IDP and ELM IDP also support the development of renewable energy. The development of the proposed PV SEF is therefore supported by key policy and planning documents.

6.1 LEGISLATIVE FRAMEWORK

The National Environmental Management Principles specifically inter alia require the following:

- *Environmental Management must place people and their needs at the forefront of its concern and equitably serve their interests;*
- *Environmental Management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option;*
- *Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person; and*
- *Decisions must take into account the interests, needs and values of all interested and affected parties;*
- *The Environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.*

Need and Desirability must thus be considered in the context of **sustainable development** which is underpinned by social, economic and environmental considerations and takes a long-term strategic view to environmental management.

6.2 SUSTAINABLE DEVELOPMENT

Sustainable development is best summarised by an extract from the United Nations World Commission on Environment and Development and reads as follows:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs… As such it requires the promotion of values

that encourage consumption standards that are within the bounds of the ecologically possible and to which all could reasonably aspire."[12]

The interdependency model for sustainable development (see Figure 19) is a framework that emphasizes the interconnectedness of economic, social, and environmental systems, and the need to address their interdependencies in a holistic manner in order to achieve sustainable development.

The model recognizes that economic development, social development, and environmental sustainability are mutually reinforcing, and that neglecting any one of these dimensions can have negative consequences for the others. For example, environmental degradation can have negative impacts on social and economic well-being, while economic growth that does not take into account environmental and social considerations can be unsustainable in the long term.

The interdependency model for sustainable development emphasizes the need to adopt integrated approaches that consider the economic, social, and environmental dimensions of development. It recognizes that these dimensions are not independent, but are rather interdependent, and that achieving sustainable development requires balancing these dimensions in a way that supports their mutual reinforcement.

The model also emphasizes the importance of participation, collaboration, and partnerships in sustainable development. It recognizes that sustainable development cannot be achieved by any single actor, but rather requires the participation and collaboration of government, civil society, the private sector, and other stakeholders.

Overall, the interdependency model for sustainable development provides a framework for understanding the complex interrelationships among economic, social, and environmental systems, and for addressing these interdependencies in a holistic manner in order to achieve sustainable development.

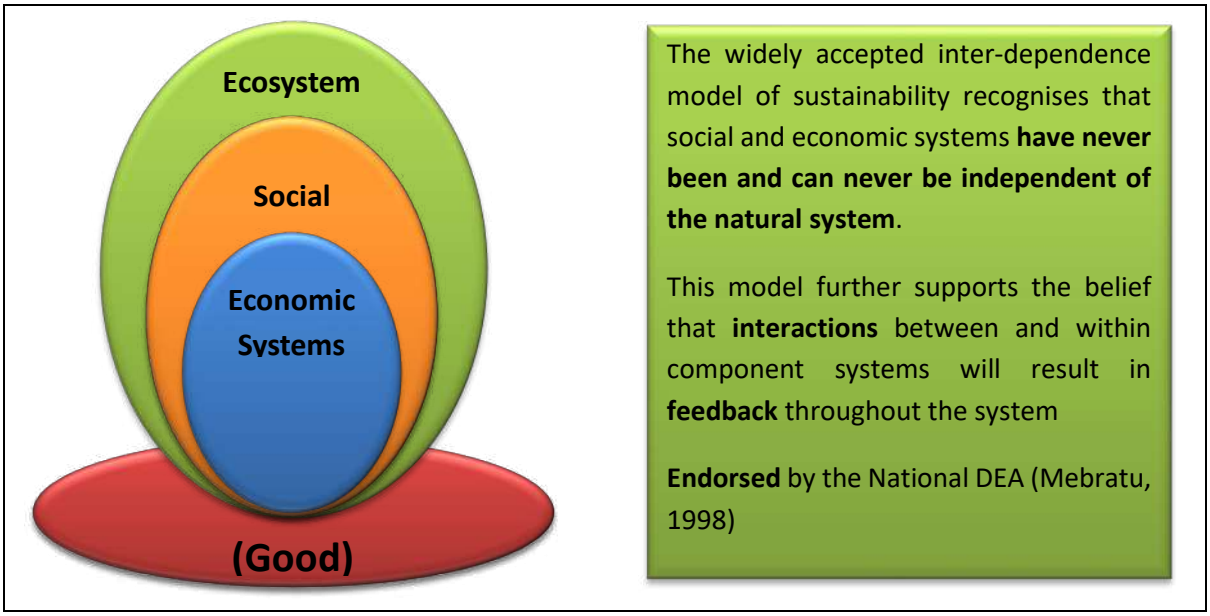


Figure 19 Interdependence Model of Sustainability

[12] *Our Common Future, WCED, 1987*

The EIA Phase will carefully consider and assess the broad principles of sustainable development in order to clearly demonstrate the "need and desirability" of the proposed activity in the context of NEMA.

6.3 NATIONAL NEED AND DESIRABILITY MOTIVATION FOR THE PVSEF

The requirement for renewable energy projects (solar, wind, hydrological to name a few) across the country has been steadily increasing within the last five to ten years. Renewable energy has been found to be a reliable source of alternative energy supply to the ever under equipped national grid. The need for such renewable energy is equivalent to the increasing population and economic growth and development within South Africa.

South Africa has one of the most carbon-intensive economies in the world, therefore making the greening of the electricity mix a national imperative. Within this context the green economy is an extremely important trigger and lever for enhancing a country's growth potential and redirecting its development trajectory in the 21st century. The attractiveness of solar technologies is not only supported by local conditions, but also by the relatively mature stage of their technological development.

From a national perspective, there are several needs and desirability factors associated with the development of a PVSEF:

Electricity supply: South Africa has faced chronic electricity shortages in recent years, which have had negative impacts on economic growth and social development. The development of Soyuz 4 Solar PV Park can contribute to the electricity supply and help to meet the growing demand for energy.

Climate change mitigation: South Africa is one of the world's largest emitters of greenhouse gases, which contributes to global climate change. The development of Soyuz 4 Solar PV Park can help to mitigate climate change by reducing the country's reliance on fossil fuels and reducing greenhouse gas emissions.

Economic development: The development of Soyuz 4 Solar PV Park can contribute to economic development by creating jobs and attracting investment. The construction and operation of a PVSEF requires skilled labour, which can create employment opportunities in the local community. In addition, the development of a solar PV park can attract domestic and foreign investment, which can contribute to economic growth.

Environmental sustainability: South Africa is a country with rich biodiversity and natural resources that need to be protected. The development of Soyuz 4 Solar PV Park can contribute to environmental sustainability by reducing the negative impacts associated with the extraction and transportation of fossil fuels.

Social development: In South Africa, there are many rural and remote communities that lack access to electricity. The development of the Soyuz 4 Solar PV Park can contribute to providing reliable source of electricity to these communities, which can support social development and improve living standards.

Renewable energy targets: South Africa has set a target of generating 18 GW of renewable energy by 2030, with solar PV being a major component of this target. The development of the Soyuz 4 Solar PV Park can contribute to meeting this national target.

In summary, the development of Soyuz 4 Solar PV Park in South Africa is a desirable and necessary strategy for meeting the energy needs of the country. This development can enhance energy security, contribute to the electricity supply, mitigate climate change, support economic development, improve energy affordability, promote environmental sustainability, and support social development.

6.4 REGIONAL NEED AND DESIRABILITY MOTIVATION FOR THE PVSEF

From a regional perspective in the Northern Cape province of South Africa, there are several needs and desirability factors associated with the development of the Soyuz 4 Solar PV Park:

Economic development: The Northern Cape is a region with significant potential for economic development, but it is also one of the poorest provinces in South Africa. The development of the Soyuz 4 Solar PV Park can contribute to economic development by creating jobs and attracting investment. The construction and operation of a solar PV park requires skilled labour, which can create employment opportunities in the local community. In addition, the development of a solar PV park can attract domestic and foreign investment, which can contribute to economic growth.

Social development: The Northern Cape is a region with many rural and remote communities that lack access to electricity. The development of the Soyuz 4 Solar PV Park can provide a reliable source of electricity to these communities, which can support social development and improve living standards.

Resource availability: The Northern Cape is a region with abundant solar radiation, which makes it an ideal location for the development of the Soyuz 4 Solar PV Park. The high levels of solar radiation in the region can support the generation of large amounts of electricity from solar PV, which can help to meet the energy needs of the region and contribute to meeting national renewable energy targets.

In summary, the development of the Soyuz 4 Solar PV Park in the Northern Cape province of South Africa is a desirable and necessary strategy for meeting the energy needs of the region. A PVSEF can enhance the electricity supply, contribute to economic development, improve energy affordability, promote environmental sustainability, support social development, contribute to meeting national renewable energy targets, and take advantage of the abundant solar resources available in the region.

6.5 SITE SPECIFIC NEED AND DESIRABILITY MOTIVATION FOR THE PVSEF

The proposed Soyuz 4 Solar PV Park is highly desirable due to its unique site-specific benefits. The area offers ample open space that is suitable for solar facility development, along with a amply high solar resource to generate renewable energy.

The proposed facility is earmarked for an area where environmental sensitivities to such a development are low, ensuring that it is a responsible and sustainable project that will have nominal negative impacts on the surrounding environment but significantly contribute to socio-economic development by locally and regionally.

The facility will create employment opportunities for the local community, providing a much-needed boost to the local economy. In addition, the skills development that will be provided to employees and contractors involved in the construction and operation of the facility will have a lasting impact on the community.

In conclusion, the proposed solar PV facility near Britstown is highly desirable due to its many benefits, including renewable energy generation, employment opportunities, skills development, and responsible environmental stewardship.

6.6 GUIDELINES ON "NEED AND DESIRABILITY"

This Scoping Report has carefully considered and applied the DEA (2017), Guideline on Need and Desirability, Department of Environmental Affairs (DEA), Pretoria, South Africa and it is herewith proposed that the PVSEF is aligned with the requirements of the Guidelines. In summary, the footprint of the PVSEF will be placed in acceptable areas on the site, which have been informed by the Professional Team. The Professional Team's assessments and the EAPs overall opinion is that the proposed PVSEF will "secure ecological sustainable development and use of natural resources." Further, based on the Professional Team's assessments and providing that the Applicant adheres to all the mitigation measures prescribed by the Professional Team, the proposed PVSEF will "promote justifiable economic and social development."

The questions below based on the Need and Desirability Guidelines demonstrate that the proposed PVSEF is underpinned by the principles therein.

1. Is the activity permitted in terms of the property's existing land use rights?

Yes. The land is currently utilised for agricultural and will be sold and transferred to the Applicant. The proposed Facility falls within the Emthanjeni Local Municipality (ELM), which is located within the Pixley Ka Seme District Municipality (PKSDM). The SDF for the ELM does not stipulate zoned land uses areas and land uses. The general area is dominated by agricultural land uses. The overall agricultural potential for the general area is medium and therefore appropriate for the proposed Soyuz 4 Solar PV Facility. The proposed Facility also falls within larger National and Provincial corridors and zones which have been identified for renewable energy development zones. Any requirements for land use rights, land ownership and land transfers will be addressed in detail during the assessment phase.

2. Will the activity be in line with the Provincial Spatial Development Framework (PSDF)?

The PSDF for the Northern cape strategy referred to in the PSDF for infrastructure includes achieving the provision of green infrastructure which includes renewable energy. The 2040 Vision of the PSDF identifies key opportunities for the Northern Cape. These include the strengthening of the development triangle that is formed by the linking of Kimberly, Vryburg, Upington and De Aar. The development triangle sustains a diverse economy with strong mining, agricultural, and renewable energy sectors. The PSDF states that a sustainable and viable economic network must be pursued within the development triangle with the purpose of improving the return of public investment in the province.

The development at the Britstown Solar PV Soyuz 4 Facility will contribute directly to meeting the need of renewable energy infrastructure within the PKSDM and ELM. The proposed project will be feeding into the development triangle scheme and thus is in line with the Provincial SDF.

3. Will the activity be in line with the Urban Edge / Edge of Built Environment for the area?

Not applicable.

4. Will the activity be in line with the Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the local Municipality; would the approval of this application compromise the integrity of the existing approved and credible Municipal IDP and SDF?

No, the proposed development will not compromise the integrity of the existing approved and credible IDP. There is no SDF for the Emthanjeni Local Municipality. In terms of the Municipal Systems Act (Act No. 32 of 2000), every Municipality in South Africa is obliged to develop an Integrated Development Plan (IDP) to realise the constitutional mandate of local government. The IDP is a strategic management tool, which aims to guide and align all planning, budgeting and operational decisions of the Municipality and other spheres of governments. It is a legally binding document that is developed at local government level.

The Emthanjeni Local Municipality (ELM) is a category B municipality consisting of three towns, namely, De Aar, Britstown and Hanover. The vision of the ELM is “Leading sustainable development for inclusive economic growth”. The mission statement linked to the vision is “To create a viable economic development plan that is relevant to the characteristics of the Emthanjeni Municipal area, designed to create and maintain a sound and healthy local economy, drawing upon local strengths and resources.

The IDP refers to the national economic pillars adopted on the National Framework for Local Economic Development in South Africa which launched in 2014. The pillars are aligned to the main thrusts and opportunities within ELM to ensure an integrated approach for optimal rate of implementation and economic development in the municipality. The five pillars are:

- Pillar 1: Building a Diverse Economic Base.
- Pillar 2: Developing learning and skilful economies.
- Pillar 3: Developing Inclusive Economies.
- Pillar 4: Enterprise Development and Support.
- Pillar 5: Economic Governance and Infrastructure.

The proposed Soyuz 4 Solar PV Park relates directly to Pillars 1, 2, 3, 4 and 5. The proposed Facility will also meet several of the strategic objectives of the ELM IDP such as: economic development, infrastructure development, SMME development, and skills development. Overall, the proposed development is in line with the district level SDF and the local municipal Framework Plan and will have positive impacts on the socio-economic environment, whilst meeting the needs of both the district and local IDP goals.

5. Will the activity be in line with an approved Structure Plan of the Municipality?

Yes. The proposed Soyuz 4 Solar PV Park is in line with the requirements of the ELM. The area is ideally located for renewable energy developments and this linked with the recent investments that are aligned with the ELM strategic structure development plans. These municipal plans re-iterate the need for economic investment and diversification and skills development for the local Municipality and the pursuit of sustainability goals.

6. Will the activity be in line with an Environmental Management Framework (EMF) adopted by the Department; would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?

An EMF for the Emthanjeni Local Municipality has not been developed yet. However, to realise local municipal goals and visions, the Local Municipality has included environmental management policies and principles in its IDP, to emphasize the Municipality's commitment to conserving its natural resources and ensure that the principles of the National Environmental Management Act (Act 107 of 1998) (NEMA) are realised.

The approval of this application would not compromise the integrity of any potential existing environmental management priorities for the area. The Scoping and Environmental Assessment Report will address any potential environmental issues and concerns in detail. This will be substituted with relevant specialist reports. Although the site does not fall specifically into the solar corridor for the Northern Cape, it is located within ideal solar PV development zones which have been pre-approved.

7. Will the activity be in line with any other plans (e.g. Guide Plan)?

Yes, the development is in line with the following:

- The White Paper on the Energy Policy of the Republic of South Africa (1998)
- The White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)
- The Integrated Energy Plan (IEP)
- The Integrated Resources Plan for Electricity (IRP) (2010-2030
- New Growth Path (NGP) Framework (2010)
- National Development Plan 2030 (2012)
- National Climate Change Response Policy (2011)
- Climate Chante Bill (2018)
- Northern Cape Provincial Spatial Development Framework (PSDF 2012 & 2018)
- Norther Cape Climate Chante Response Strategy
- Northern Cape Province Green Document
- Pixley District Municipality Integrated Development Plan (2019 – 2020)
- Pixley Ka Seme District Municipality Spatial Development Framework (SDF 2017)
- Emthanjeni Local Municipality Integrated Development Plan (IDP, 2021-2022)

8. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?

Yes. Refer to question 4 above. The proposed project is in line with the future development goals and objectives of the PSDF and IDP, and the Emthanjeni Local Municipality associated timeframes.

9. Does the community / area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate?).

The benefits of the proposed activities and associated expanded business would accrue to the local Britstown communities and surrounding communities. As this project falls within a Provincial scale, the economic, social, and environmental offset benefits are significant. The proposed facility will aim to produce a capacity of 300MW of power with a battery storage capacity of 1200 MWh. The findings of the Scoping level SIA indicate that the development of the proposed Soyuz 4 Solar PV Park and associated infrastructure will create employment and business opportunities for the ELM during both the construction and operational phase of the project. All of the potential negative impacts, with the exception of the impact on sense of place, can also be effectively mitigated. The positive impacts will accrue directly to the local communities and surrounds.

The establishment of a Community Trust will also benefit the local community. The enhancement measures listed in the report should be implemented in order to maximise the potential benefits. The significance of this impact is rated as High Positive. The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the negative environmental and socio-economic impacts associated a coal-based energy economy and the challenges created by climate change, represents a significant positive social benefit for society. The Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) has resulted in significant socio-economic benefits, both at a national level and at a local, community level. These benefits are linked to foreign Direct Investment, local employment and procurement and investment in local community initiatives. The establishment of the proposed Soyuz 4 Solar PV Park and associated infrastructure including a battery energy storage system (BESS) is therefore supported by the findings of the Scoping level SIA.

10. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?

No, however, the establishment of several PV SEFs and other REFs has the *potential* to place pressure on local services and accommodation, specifically during the construction phase. The objective will be to source as many low and semi-skilled workers for the construction phase from the ELM. This will reduce the pressure on local services and accommodation and the nearby town of Britstown and De Aar. The capacity of accommodate workers will be addressed during the assessment phase. The potential impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of the proposed facility and associated renewable energy projects in the ELM. These benefits will create opportunities for investment in the

ELM, including the opportunity to up-grade and expand existing services and the construction of new houses.

The establishment of the proposed PV SEF and other renewable energy projects in the area does have the *potential* to place pressure on the local towns in the ELM, specifically Britstown and De Aar. The impact will depend on the timing of the construction phase for the different projects. However, the potential impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of the proposed facility and other associated renewable energy projects in the ELM. These benefits will create opportunities for investment in the ELM and PKSDM, including the opportunity to up-grade and expand existing services and the construction of new houses. Socio-economic development (SED) contributions also represent an important focus of the REIPPPP and is aimed at ensuring that the build programme secures sustainable value for the country and enables local communities to benefit directly from the investments attracted into the area. The proposed SEF is also required to contribute a percentage of projected revenues accrued over the 20-year period to SED. This will provide revenue that can be used by the PKSDM to invest in up-grading local services where required. In should also be noted that it is the function of national, provincial, and local government to address the needs created by development and provide the required services. The additional demand for services and accommodation created by the establishment of development renewable energy projects should therefore be addressed in the Integrated Development Planning process undertaken by the ELM.

11. Is this development provided for in the infrastructure planning of the Municipality, and if not, what will the implication be on the infrastructure planning of the Municipality (priority and placement of services and opportunity costs)?

The ELM IDP (2021-2022) lists strategic objectives which include: economic development and infrastructure development. The Soyuz 4 Solar PV Park is a privately funded project and contributes directly to the ELM strategic objectives. The Facility will provide adequate electrical infrastructure and energy to the local and surrounding towns. Furthermore, the Facility will be ideally located way from the main town so as not to compromise on existing Municipal infrastructural development plans. Please refer to question 10 above for more information.

12. Is this project part of a national programme to address an issue of national concern or importance?

No, the project is not of a national programme as it is privately owned and funded. However, despite this the benefits of the electrical generation will accrue to the local and surrounding communities. Furthermore, the Soyuz 4 Solar PV Park is one of six Soyuz Solar PV Facilities being developed in this area with the specific purpose of addressing the current national energy crisis.

13. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context).

Yes. Zoning information is not available for the site, however, the existing land uses included unclassified land use, extensive agriculture of medium sensitivity and open rural lands. The Soyuz 4 Solar PV Facility is one of six Soyuz Solar PV Facilities in the Britstown area. The proposed project is

aligned with the National and provincial SDFs and IDPs which identify the Northern Cape and sections of the Northern Cape as an ideal location for solar PV Facilities. The PKSDM also falls within the Solar Development Corridor as identified in the Northern Cape Provincial Spatial Development Framework. The corridor extends from Kakamas to Upington and down to De Aar in the south-east. Section 5.6.1 of the SDF also refers to the establishment of a Renewable Energy Hub proposed for the Northern Cape stretching from the west coast right up to the De Aar region. The Hub can accommodate special economic development within the zone as earmarked and entails a 100km wide zone.

The *potential* cumulative impacts on the areas sense of place will be largely linked to potential visual impacts. In this regard the Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. These issues are also likely to be relevant to solar facilities and associated infrastructure. The relevant issues identified by Scottish Natural Heritage study include:

- Combined visibility (whether two or more wind farms will be visible from one location).
- Sequential visibility (e.g. the effect of seeing two or more wind farms along a single journey, e.g. road or walking trail).
- The visual compatibility of different wind farms in the same vicinity.
- Perceived or actual change in land use across a character type or region.
- Loss of a characteristic element (e.g. viewing type or feature) across a character type caused by developments across that character type.

The guidelines also note that cumulative impacts need to be considered in relation to dynamic as well as static viewpoints. The experience of driving along a tourist road, for example, needs to be considered as a dynamic sequence of views and visual impacts, not just as the cumulative impact of several developments on one location. The viewer may only see one renewable energy facility and the associated infrastructure at a time, but if each successive stretch of the road is dominated by views of renewable energy facilities, then that can be argued to be a cumulative visual impact (National Wind Farm Development Guidelines, DRAFT - July 2010).

As indicated above, the potential impact of the proposed individual PV SEFs and associated infrastructure on the areas sense of place is likely to be limited. This will be confirmed during the assessment phase.

14. Will the benefits of the proposed land use / development outweigh the negative impacts of it?

Yes. Refer to questions 9 and 13 for more information.

Renewable energy sites are highly suited to rural locations with otherwise poor potential to attract local inward investment therefore enabling to target particularly vulnerable areas. The positive economic benefits can also be specifically realised through the establishment of community benefit schemes. These benefits would also apply to solar projects. The BBBEE requirements for developers as set out in the DoE's IPPPP for renewables is the primary driver for such schemes. The procurement programme, in keeping with the objective of maximising the economic development potential from this new sector, includes a specific focus on local communities in which wind farms are located. It is clear that targeted development expenditure will be directed to multiple rural communities and there seems to be a strong potential to deliver socio-economic benefits.

Furthermore, creation of employment and business opportunities, and opportunity for skills development and on-site training are the most significant socio-economic positive impacts of the proposed development. The construction phase of each PV SEFs will extend over a period of approximately 18 months and create in the region of 150 employment opportunities. Members from the local communities in the area, specifically Britstown and De Aar, would be in a position to qualify for most of the low skilled and semi-skilled employment opportunities. Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members of the community. Based on information from similar projects the total wage bill will be in the region of R 25 million (2023 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the local towns in the area.

Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localised, social benefit. The capital expenditure for each PV SEF will be approximately R 1.5 billion (2022 Rand value). Due the lack of diversification in the local economy the potential for local companies is likely to be limited. The majority of benefits are therefore likely to accrue to contractors and engineering companies based outside the ELM. The local service sector will also benefit from the construction phase. The potential opportunities would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site.

The potential benefits for local communities are confirmed by the findings of the Overview of the IPPPP undertaken by the Department of Energy, National Treasury and DBSA (December 2021). The study found that to date, a total of 63 291 job years have been created for South African citizens, of which 48 110 job years were in construction and 15 182 in operations. By the end of December 2021, 85 projects had successfully completed construction and moved into operation. These projects created 44 172 job years of employment, compared to the anticipated 30 488. This was 45% more than planned.

In terms of benefits for local communities, significantly more people from local communities were employed during construction than was initially planned. For active projects, the expectation for local community participation was 13 284 job years. To date 25 272 job years have been realised (i.e. 90% more than initially planned), with 23 projects still in, or entering, construction. The number of black SA citizens employed during construction also exceeded the planned numbers by 74%.

Black South African citizens, youths and rural or local communities have been the major beneficiaries during the construction phases, as they respectively represent 81%, 44% and 48% of total job opportunities created by IPPs to date. However, woman and disabled people could still be significantly empowered as they represent a mere 10% and 0.4% of total jobs created to date, respectively. Nonetheless, the fact that the REIPPPP has raised employment opportunities for black South African citizens and local communities beyond planned targets, indicates the importance of the programme to employment equity and the drive towards more equal societies.

Another positive impact of the proposed development includes improve energy autonomy and security which ultimately improves overall quality of life. South Africa's energy crisis, which started in 2007 and is ongoing, has resulted in widespread rolling blackouts (referred to as load shedding) due to supply shortfalls. The load shedding has had a significant impact on all sectors of the economy and on investor confidence. The mining and manufacturing sector have been severely impacted and will

continue to be impacted until such time as there is a reliable supply to energy. Load shedding in the first six months of 2015 was estimated to have cost South African businesses R13.72 billion in lost revenue with an additional R716 million was spent by businesses on backup generators . A survey of 3 984 small business owners found that 44% said that they had been severely affected by load shedding with 85% stating that it had reduced their revenue, with 40% of small businesses losing 20% or more or revenue during due to load shedding period.

The proposed project will have minimal negative impacts on the surrounding environment. Any and all environmental impacts will still be further assessed in the EIA and mitigation measures will be outlined in the EMPr are implemented.

15. Will the proposed land use / development set a precedent for similar activities in the area (local Municipality)?

Yes, see answer 13 above. The Soyuz 4 Solar PV Park is one of six Solar PV facilities. Furthermore, the Northern Cape in general has been identified as the ideal location for Solar PV Facilities. Therefore, it is very likely that this project will set the precedent for similar activities in the area.

16. Will any person's rights be negatively affected by the proposed activity/ies?

No.

17. Will the proposed activity/ies contribute to any of the 18 Strategic Integrated Projects (SIPS)?

Please see the feedback provided in Table 6.

Table 6 Strategic Integrated Projects

STRATEGIC INTEGRATED PROJECTS	X = YES
Green Economy + "Green" and energy-saving industries	**X**
Infrastructure – electricity (generation, transmission & distribution)	**X**
Biofuels	
Basic Services (local government) – electricity and electrification	**X**
Basic Services (local government) – area lighting	
Infrastructure – transport (roads, land strips)	
Basic services (local government access roads)	
Basic services (local government) – public transport	
Infrastructure – water (bulk and reticulation)	
Basic services (local government) – sanitation	

STRATEGIC INTEGRATED PROJECTS	X = YES
Basic services (local government) – waste management	
Agricultural value chain + agro processing (linked to food security and food pricing imperatives)	**X**
Infrastructure – information and communication technology	
Tourism + strengthening linkages between cultural industries and tourism	
Basic services (local government) – public open spaces and recreational facilities	

18. What will the benefits be to society in general and to the local communities?

The benefits of the proposed activities and associated expanded business would accrue to the local Britstown communities and surrounding communities. As this project falls within a Provincial scale, the economic, social and environmental offset benefits are significant. The proposed facility will aim to produce a capacity of 300MW of power with a battery storage capacity of 1200 MWh. The findings of the Scoping level SIA indicate that the development of the proposed Soyuz 4 Solar PV Park and associated infrastructure will create employment and business opportunities for the ELM during both the construction and operational phase of the project. All of the potential negative impacts, with the exception of the impact on sense of place, can also be effectively mitigated. The positive impacts will accrue directly to the local communities and surrounds.

The proposed development represents an investment in clean, renewable energy infrastructure, which, given the negative environmental and socio-economic impacts associated a coal-based energy economy and the challenges created by climate change, represents a significant positive social benefit for society as a whole. The Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) has resulted in significant socio-economic benefits, both at a national level and at a local, community level. These benefits are linked to foreign Direct Investment, local employment and procurement and investment in local community initiatives. The establishment of the proposed Soyuz 4 Solar PV Park and associated infrastructure including a battery energy storage system (BESS) is therefore supported by the findings of the Scoping level SIA.

19. Any other need and desirability considerations related to the proposed project?

Not Applicable.

20. How does the project fit into the National Development Plan (NDP) for 2030?

The proposed project addresses Point 1, 3 and 5 (see Table 7) of the National Development Plan for 2030, through the generation of employment opportunities.

Table 7 National Development Plan

NATIONAL DEVELOPMENT PLAN	X = YES
1. Unemployment	X
2. **The quality of school education for black people is poor**	
3. Infrastructure is poorly located, inadequate and under-maintained	X
4. Spatial divides hobble inclusive development	
5. The economy is unsustainably resource intensive	X
6. The public health system cannot meet demand or sustain quality	
7. Public services are uneven and often of poor quality	
8. Corruption levels are high	
9. South Africa remains a divided society	

21. Please describe how the general objectives of Integrated Environmental Management as set out in Section 23 of the NEMA have been taken into account.

This Scoping Assessment Report covers the objectives set out in Section 23 of the NEMA. Refer to Section 8 of the Report. Specialist studies have been undertaken and consulted as part of the process. Mitigation measures have been developed to address the potential environmental impacts identified by the specialists and mitigation measures are included in the EMPr. Participation of key I&APs has been facilitated.

22. Please describe how the principles of environmental management as set out in Section 2 of the NEMA have been taken into account.

Section 2 of the NEMA states that “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”. The disturbance of ecosystems has been minimised and rehabilitation guidance is included in the EMPr.

7 SCOPING PHASE SPECIALIST STUDY FINDINGS

*In accordance with **Appendix 2 Regulation 2(1)(g) (iv); of GN No. R. 326 of the NEMA EIA Regulations (2014 as amended)**, the following information is presented in this Section:*

> ***2(1)(g) (iv)** – The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;*

During the Pre- Application Meeting with the Competent Authority (the DFFE) held on 28 February 2023 (memorandum attached in APPENDIX E) to discuss the NEMA Environmental Permitting Process for the proposed PVSEF the DFFE confirmed that the following Scoping Impact Assessments are required to form part of the NEMA Application:

- Avifaunal Scoping Assessment
- Biodiversity Scoping Assessment
- Climate Change Assessment
- Freshwater Ecological Scoping Assessment
- Geotechnical Reconnaissance Study
- Heritage Scoping Assessment
- Noise Scoping Assessment
- Social Scoping Assessment
- Soil, Land Use and Land Capability Scoping Assessment
- Town Planning
- Traffic Scoping Assessment
- Visual Scoping Assessment

Several of these studies were conducted during the period November 2022 and February 2023 and the outcomes are consolidated in this Draft Scoping Report for public consultation.

Please note the impacts identified through the Specialist Scoping Reports have been summarised in this Section and a Scoping Impact Assessment of the impacts is provided in Section 11 of this Report.

Please note that all Specialist Scoping Reports are attached in Appendix B and form part of the Scoping Report for Public Consultation.

7.1 AVIFAUNAL SCOPING ASSESSMENT

TMG, on behalf of the Applicant appointed Enviro-Insight CC (C/O Luke Verburgt) (hereinafter referred to as the "Avifaunal Specialist") to undertake the Avifaunal Assessments for the proposed PVSEF.

While each of the six proposed PVSEFs that form part of the Soyuz Solar PV Park Cluster 1-6 Project are treated as S&EIA processes for the purposes of environmental authorisation, the following factors contributed to treating the fieldwork and certain elements of the discussion as a single project:

- the same developer for each PVSEF, albeit via separate companies;
- the close spatial proximity of each PVSEF to each other;
- minimisation of establishment and disbursement costs for fieldwork execution;
- taking advantage of avifauna observations from adjacent renewable energy developments to provide a more comprehensive account of the avifauna community for the Soyuz Solar PV Park Cluster 1-6 Project and surroundings; and
- potential cumulative impacts that prevent discussion of each proposed PVSEF in isolation.

The avifaunal scoping assessment addresses the avifauna species of the Sensitive Animal Species Theme of the Scoping Phase of the S&EIA and was directed by the following requirements and guidelines:

- The minimum report content requirements for environmental impacts on terrestrial animal and plant species in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998);
- Guidance for the implementation of the above-mentioned protocol is followed according to SANBI (2020)[13], hereafter referred to as "the terrestrial animal species protocol guidelines"; and
- Guidance for avifauna studies in relation to developments of solar facilities is followed according to the "Best-Practice Guidelines for assessing and monitoring the impact of solar energy facilities on birds in southern Africa" (Jenkins et al., 2017[14]).

The Birds and Solar Energy Guidelines (Jenkins et al. 2017) provide clear requirements for Avifauna Impact Assessments of PVSEFs. PVSEFs are categorised into 3 regimes depending on the potential impact on Avifauna. The regime determines the level and intensity of surveys to be completed by the avifauna specialist. Soyuz 4 Solar PV Park is regarded to be a Regime 2 facility based on the generating capacity >100 MW and a footprint >150 ha. The requirements and the progress in effecting these requirements for a Regime 2 facility are provided in Table 8.

Table 8 Avifauna Impact Assessments Regime 2 Requirements

REQUIREMENT	PROGRESS
1. Preliminary Assessment	
a. Literature review, habitats and desktop	Documented in the Specialist Scoping Report
2. Structured and detailed data collection	
a. Baseline data collection over 6-12 months, across as many seasons as possible	A summer season survey was performed 7 – 19 January 2023. This is considered to be sufficient.
b. Small bird abundance estimates	To be provided with the final EIA report;

[13] *SANBI. 2020. Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa. South African National Biodiversity Institute, Pretoria. Version 3.1. 2022*

[14] *Jenkins AR, Ralston-Paton S, Smit-Robinson HA. 2017. Birds & Solar Energy. Best Practice Guidelines: Guidelines for assessing and monitoring the impact of solar power generating facilities on birds in southern Africa*

REQUIREMENT	PROGRESS
c. Transect and vantage point abundances for large birds and raptors	To be provided with the final EIA report
d. Flight behaviour of priority species	To be provided with the final EIA report
e. Wetland bird counts and movements between wetlands using the CWAC initiative (Taylor et al. 1999)[15]	No suitable sites on or surrounding the Soyuz Solar PV Park Cluster 1-6 Project to perform this protocol
f. Existing power line collision mortalities	To be provided with the final EIA report
3. Impact Assessment	
a. Map key habitats and flyways to be avoided	Preliminary provision made in the Specialist Scoping Report
b. Inform PVSEF layout	Preliminary provision made in the Specialist Scoping Report
c. Assess impacts and mitigation strategies	Preliminary provision made in the Specialist Scoping Report

7.1.1 Receiving Environment

Regional Context

The Soyuz 4 Solar PV Farm is situated entirely within the Least Concern "Northern Upper Karoo" regional vegetation type (Figure 20; SANBI 2018[16]) and contains mostly natural habitats, with some low intensity impacts from sheep farming. The PVSEF is not within a REDZ but is situated entirely within the Central Power Corridor. The nearest protected area is the De Aar Nature Reserve situated ~ 20 km away towards the east and the nearby "Platberg-Karoo Conservancy". The PVSEF is situated outside of this Important Bird Area (IBA) (Figure 21).

[15] *Taylor MR, Peacock F, Wanless RM. (eds). 2015. The 2015 Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland. BirdLife South Africa, Johannesburg, South Africa.*

[16] *SANBI. 2018. Beta Vegetation Map of South Africa, Lesotho and Swaziland [File geodatabase] 2018. Available from the Biodiversity GIS website (http://bgis.sanbi.org/SpatialDataset/Detail/670).*

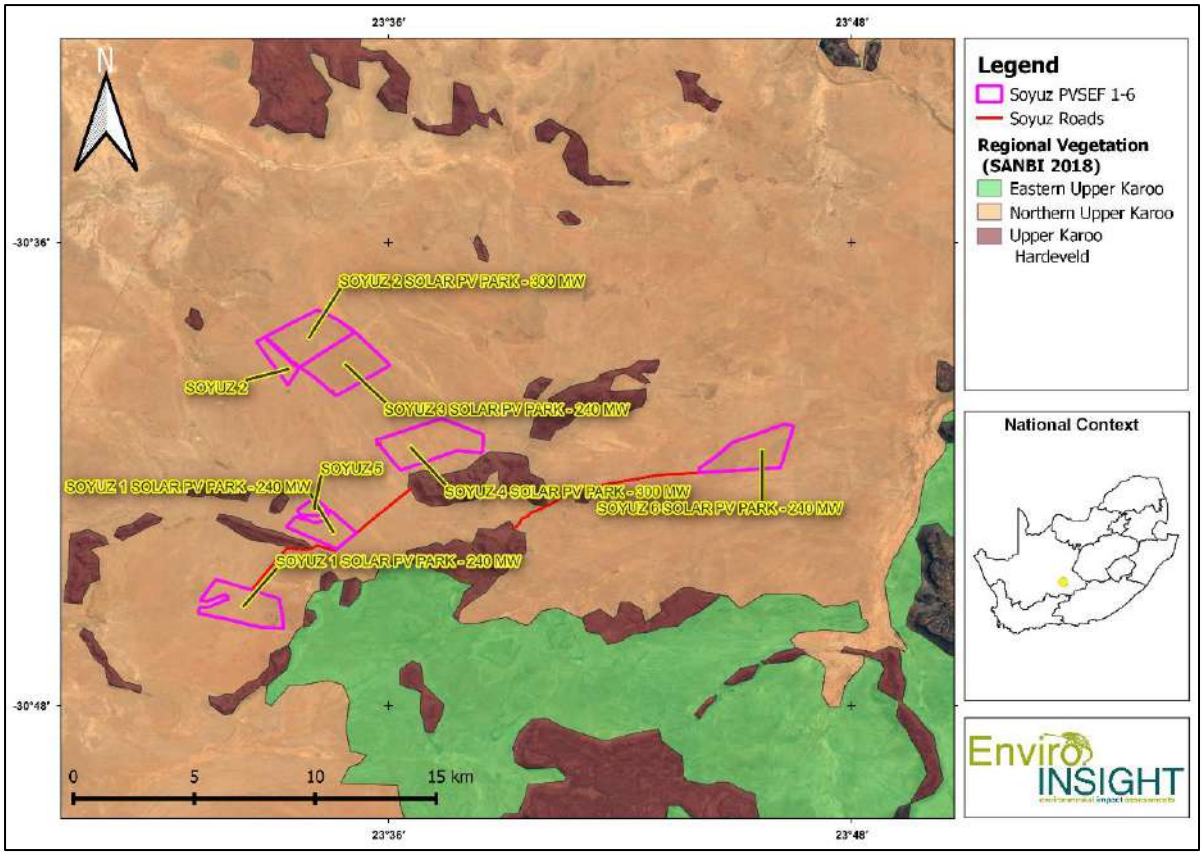


Figure 20 Regional Vegetation Types

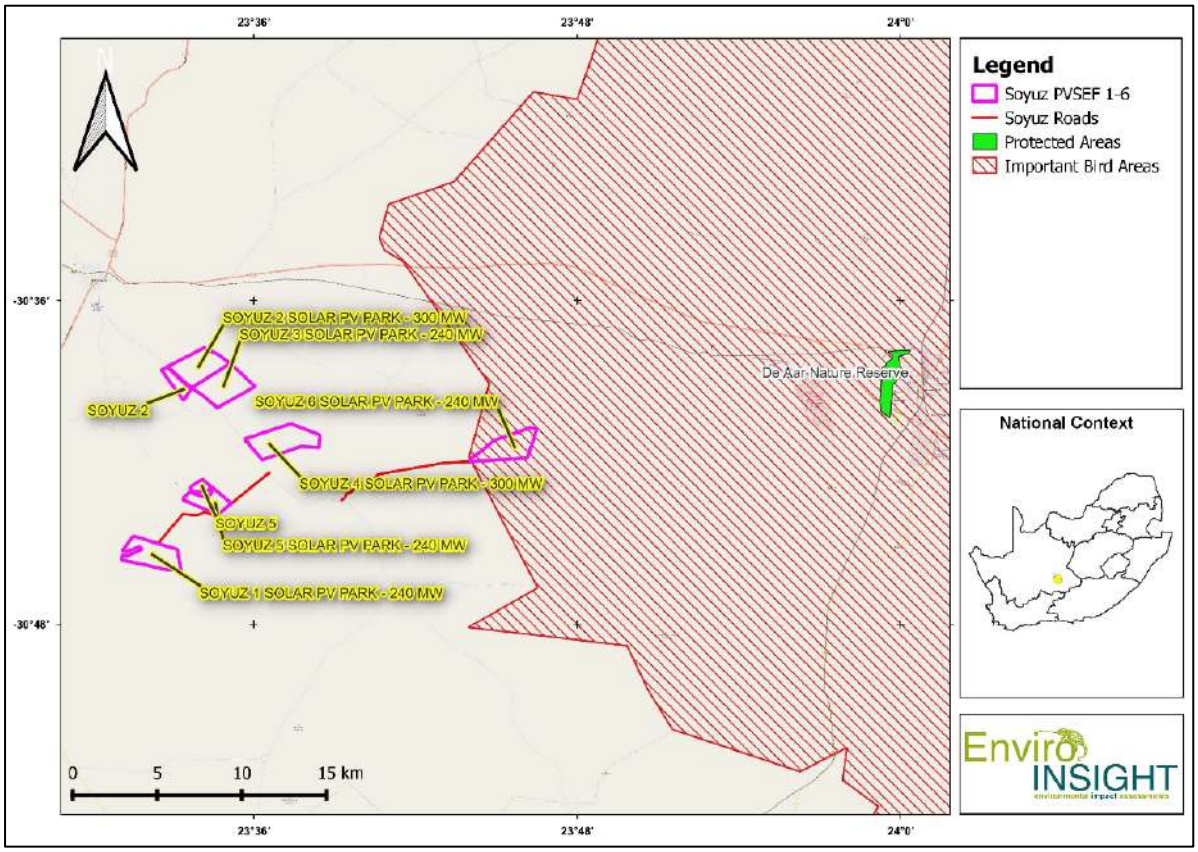


Figure 21 Regional Protected Areas and IBAs

Regional Habitat Description

The P Soyuz Solar PV Park Cluster 1-6 Project Area is located on relatively flat land, between the elevated rocky ridges characterised by Upper Karoo Hardeveld vegetation (Figure 20). These flat areas of Northern Upper Karoo vegetation are characterised by two major habitat types; namely Nama Karoo Low Shrubland and Natural Grassland according to the National Landcover Classification (NLC) (Figure 22).

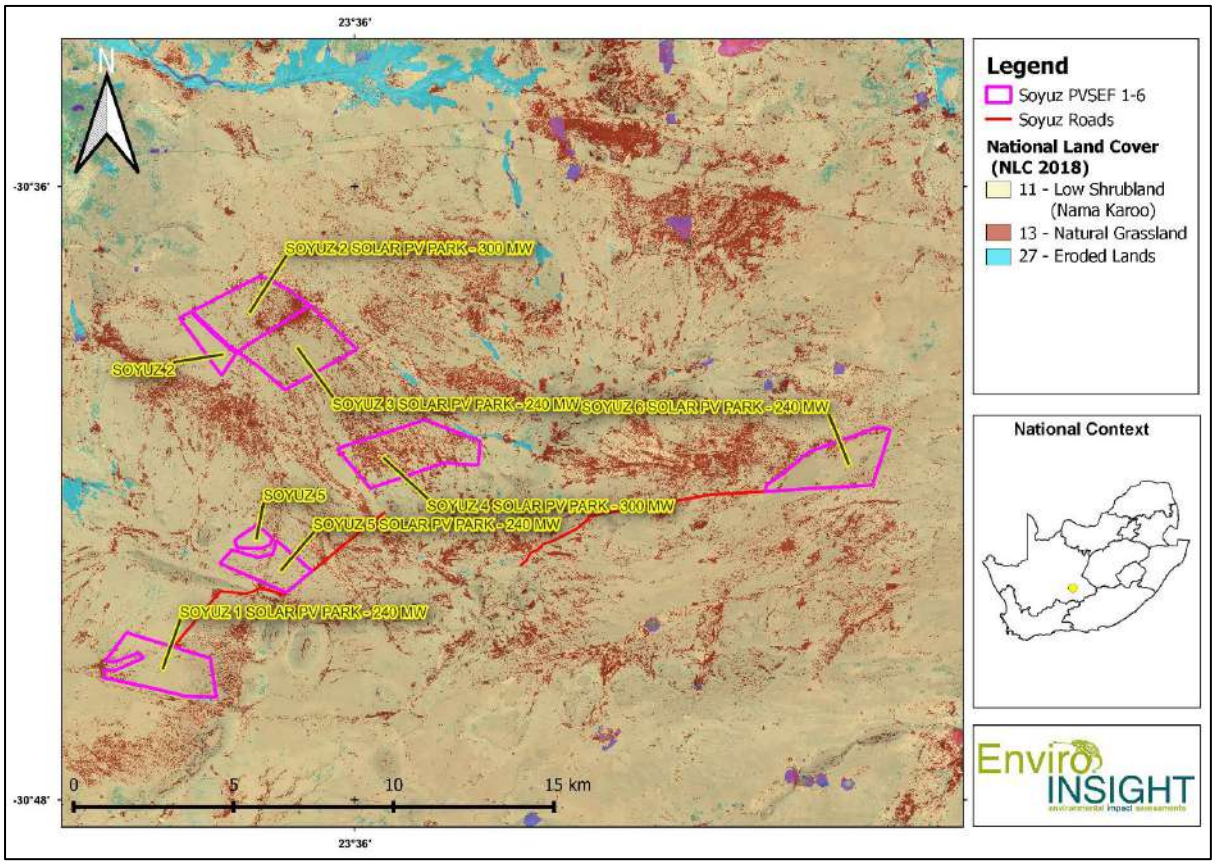


Figure 22 Regional Major Habitats

Regional Expected and Observed Avifauna

A total of 114 bird species have been recorded by the South African Bird Atlas Project (SABAP2) on the seven focal pentads in which the Soyuz Solar PV Park Cluster 1-6 Project is situated, all of which are expected to occur on the sites. Four species of conservation concern (SCC; threatened and near-threatened) have been observed within at least one of the seven focal the pentads in which the development is situated namely Verreaux's Eagle (VU), Karoo Korhaan (NT), Blue Crane (NT) and Ludwig's Bustard (EN).

However, these pentads suffer from under-sampling as an additional 18 species, 6 of which are SCC have been observed by the Avifaunal Specialist in recent surveys of these sites. Table 9 shows the 10 expected and observed avifauna SCC for the Soyuz PVSEF Cluster.

Table 9 Regional Area Expected Avifauna SCC Observed

COMMON NAME	SCIENTIFIC NAME	# SABAP2 pentads (7 max)	January 2023 survey	Global Status (IUCN)[17]	Regional Status
Ludwig's Bustard	Neotis ludwigii	3	X	EN	EN
Black Harrier	Circus maurus	-		EN	EN
Tawny Eagle	Aquila rapax	-	X	VU	EN
Verreaux's Eagle	Aquila verreauxii	1		LC	VU
Denham's Bustard	Neotis denhami	-		NT	VU
Lanner Falcon	Falco biarmicus	-	X	LC	VU
Secretarybird	Sagittarius serpentarius	-	X	EN	VU
Karoo Korhaan	Eupodotis vigorsii	5	X	LC	NT
Blue Crane	Grus paradisea	3	X	VU	NT
Kori Bustard	Ardeotis kori	-	X	NT	NT

The total number of bird species observed within and around the Soyuz Solar PV Park Cluster 1-6 Project site during the summer survey (7-19 January 2023) was 72 from 1605 observation comprising a total of 3013 individuals. The observed avian species richness is relatively low but expected for this region and abundances were moderate to high due to a productive summer season.

Local Habitats

The habitats observed within the Soyuz 4 Solar PV Park were consistent with the national landcover data (Figure 22) and consisted predominantly of grassland on soft sandy soils and scrubland on harder more stony soils (Figure 23) . These habitats were fairly homogenous and occasionally formed mosaics along the ecotone between habitats. No major drainage lines or rocky ridge habitats were observed within the proposed development footprint but were present outside of the boundary. All of the major habitats are mapped inFigure 24.

[17] *Endangered (EN) – very high risk of extinction in the wild; Vulnerable (VU) – considered to be at high risk of unnatural extinction without further human intervention; Near threatened (NT) – close to being endangered soon; Least concern (LC) – unlikely to become endangered or extinct in the near future.*

Grassland on soft sandy soils

Scrubland/grassland mosaic on harder stony soils

Figure 23 Project Site Major Habitat Types

Observed Avifauna

A total of 516 individuals representing 40 species were observed during the summer survey of the project site (Table 10). Of these, one species is considered to be of conservation concern, namely the Ludwig's Bustard, which was observed twice (single individuals) within the project site

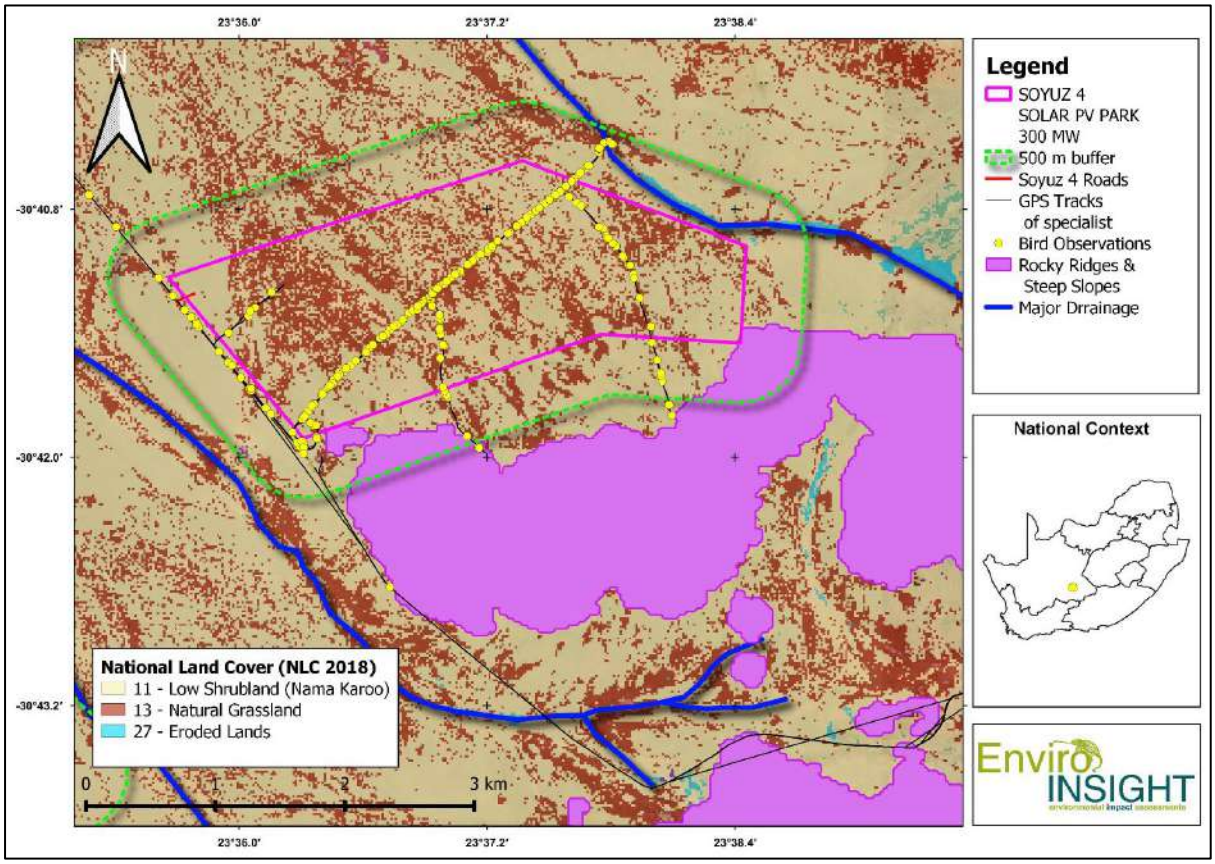


Figure 24 Habitat Delineation and Avifaunal Observations

Table 10 Observed Avifauna Species

COMMON NAME	SCIENTIFIC NAME	TOTAL
Northern Black Korhaan	*Afrotis afraoides*	15
Egyptian Goose	*Alopochen aegyptiaca*	2
African Pipit	*Anthus cinnamomeus*	3
Little Swift	*Apus affinis*	4
Common Swift	*Apus apus*	39
Jackal Buzzard	*Buteo rufofuscus*	1
Fawn-coloured Lark	*Calendulauda africanoides*	2
Sabota Lark	*Calendulauda sabota*	14
Karoo Scrub Robin	*Cercotrichas coryphoeus*	18
Kalahari Scrub Robin	*Cercotrichas paena*	1
Spike-heeled Lark	*Chersomanes albofasciata*	42
Black-chested Snake Eagle	*Circaetus pectoralis*	3
Desert Cisticola	*Cisticola aridulus*	41
Zitting Cisticola	*Cisticola juncidis*	3
Grey-backed Cisticola	*Cisticola subruficapilla*	23
White-backed Mousebird	*Colius colius*	19
Speckled Pigeon	*Columba guinea*	11
Pied Crow	*Corvus albus*	17
White-throated Canary	*Crithagra albogularis*	9
Lark-like Bunting	*Emberiza impetuani*	19
Yellow-bellied Eremomela	*Eremomela icteropygialis*	1
Amur Falcon	*Falco amurensis*	2
Large-billed Lark	*Galerida magnirostris*	5
Barn Swallow	*Hirundo rustica*	60
Southern Fiscal	*Lanius collaris*	1
Rufous-eared Warbler	*Malcorus pectoralis*	49
Chat Flycatcher	*Melaenornis infuscatus*	9
Pale Chanting Goshawk	*Melierax canorus*	1
Eastern Clapper Lark	*Mirafra fasciolata*	39
Ant-eating Chat	*Myrmecocichla formicivora*	9
Ludwig's Bustard	*Neotis ludwigii*	2
Namaqua Dove	*Oena capensis*	8
Cape Sparrow	*Passer melanurus*	2
Southern Masked Weaver	*Ploceus velatus*	4
Black-chested Prinia	*Prinia flavicans*	4
Red-billed Quelea	*Quelea quelea*	8
Scaly-feathered Weaver	*Sporopipes squamifrons*	14
Ring-necked Dove	*Streptopelia capicola*	3
Bokmakierie	*Telophorus zeylonus*	6
Red-faced Mousebird	*Urocolius indicus*	3
Grand Total	***40***	**516**

7.1.2 Potential Impacts Identified

Existing Impacts

Very low levels of existing impacts to avifauna were observed in the Soyuz 4 Solar PV Park during the surveys. Land use is almost exclusively low intensity livestock farming. Nevertheless, some potential impacts to avifauna observed on site include:

- **Livestock grazing** – reduces plant diversity and abundance and therefore habitat viability for foraging avifauna. However the low intensity of this practice is unlikely to have significantly altered the avifauna assemblage within the region.
- **Built infrastructure** – Some small farm structures, predominantly drinking facilities for livestock, are present which modify the habitat. Usually this is through the presence of a few alien trees which function as an attractant for avifauna and the trampling of vegetation by livestock which removes foraging habitat for birds.
- **Alien and invasive species** – Very few alien tree species are present, usually in association with the built infrastructure.

Anticipated Impact Descriptions

The main anticipated environmental impacts on avifauna from the proposed Soyuz 4 Solar PV Park are described in Figure 25.

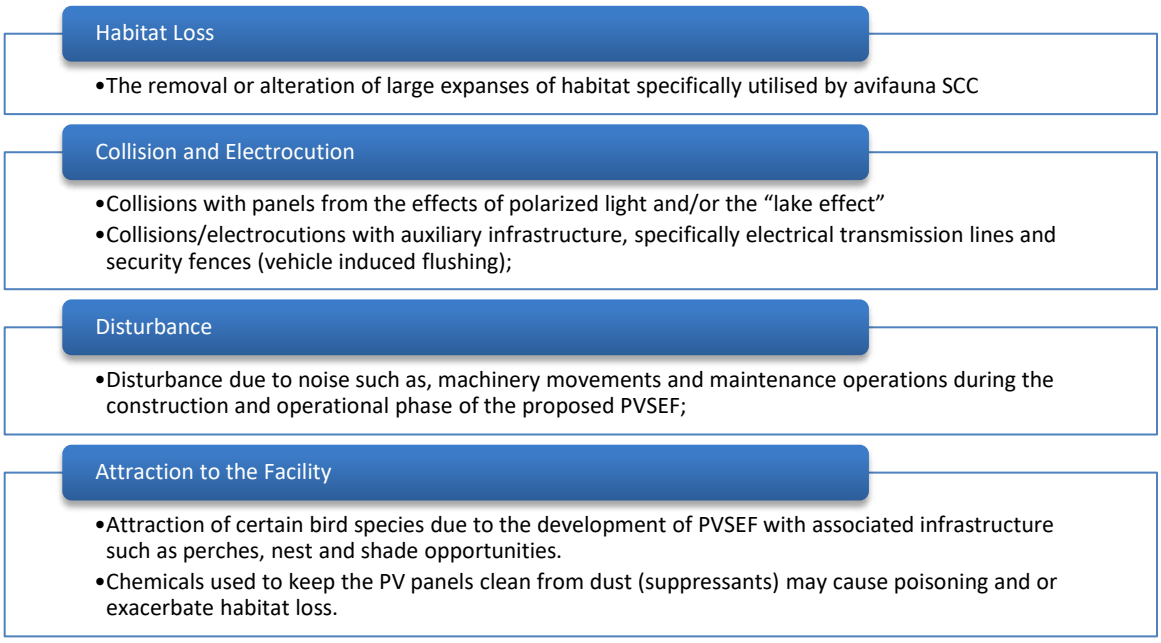


Figure 25 Avifauna Impacts Descriptions

Cumulative Impacts

There are seven known PVSEFs and two known WEFs within a 30 km radius of the proposed Soyuz Solar PV Park Cluster 1-6 (Figure 26). The proposed Soyuz PVSEF Cluster itself only represents 0.6% of

the area, indicating an insignificant proportion of transformation in the regional context that can be expected from this development alone.

Cumulative negative impacts expected to bustard species in the region due to their propensity for collision with overhead powerlines which cannot be completely mitigated with current measures such as bird flight diverters. Some cumulative impact to these species is therefore expected in the region from the renewable energy developments but it is not possible to accurately calculate the magnitude of this impact at this stage. More research is required to assess these impacts appropriately and develop mitigation solutions that are more effective than those currently available.

Based on the findings of the Scoping Phase Avifauna report before the EAP, the appointed specialist ***has not identified any fatal flaws*** *with the project proposal, and it is reasonable to suggest that* ***the proposed PVSEF is acceptable from a Avifauna perspective.***

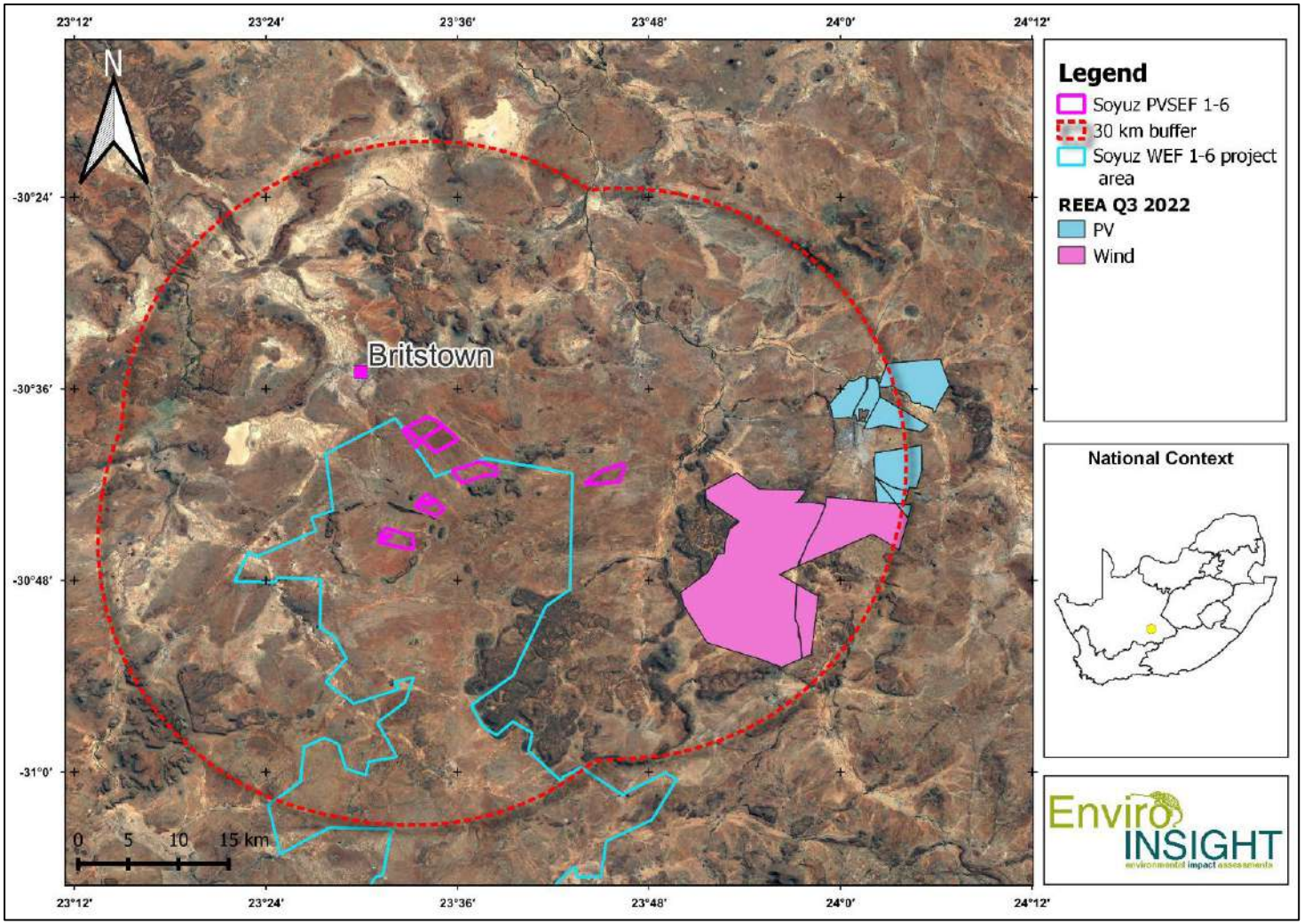


Figure 26 Location of Known Regional Renewable Energy Projects

7.2 BIODIVERSITY SCOPING ASSESSMENT

TMG, on behalf of the Applicant appointed SAS (C/O MS Nelanie Cloete) (hereinafter referred to as the "Terrestrial Specialist") to undertake a Terrestrial Biodiversity Impact Assessment for the proposed PVSEF.

7.2.1 Receiving Environment

Vegetation

Soyuz 4 Solar PV Park is located within the Northern Upper Karoo vegetation type, a Shrubland dominated by dwarf karoo shrubs, grasses and Acacia (now Senegalia) mellifera subsp. detinens and some other low trees (especially on sandy soils in the northern parts and vicinity of the Orange River). The site is flat to gently sloping, with isolated hills of Upper Karoo Hardeveld in the south and Vaalbos Rocky Shrubland in the northeast and with many interspersed pans.

Prior to the site assessment, the area surrounding Britstown received a good rainfall, allowing for ample vegetation cover and growth. An assortment of grass and woody dwarf shrubs were recorded during the site assessment.

A single habitat unit was identified within the Soyuz 4 Solar PV Park footprint area (see Figure 27). This habitat unit was divided into three subunits, namely

- **Plains**: This plains vegetation is mostly widespread in the Britstown and De Aar areas. It occupies the entire Soyuz 4 Solar PV Park footprint area. The vegetation mostly consists of low dwarf shrubs, along with various graminoids. The vegetation of this habitat unit is regarded representative of the reference vegetation type.

- **Open Karoo veld**: This subunit covered around 15-20% of the Soyuz 4 Solar PV Park within the north-eastern portions. The vegetation consisted of both good vegetation cover and species diversity with a wholesome mix of grasses and short shrubs. Dominant grass species include Eragrostis lehmanniana, E. obtusa, Stipagrostis cilliata, Aristida congesta and A. diffusa. Shrubs included Atriplex spongiosa, Aptosimum marlothii and Galenia exigua. Some herbs were also present namely Hermannia comosa, Indigofera alternans and Hermannia spinosa.

- **Low open shrubland**: The majority of the Soyuz 4 Solar PV Park were representative of this habitat subunit. This subunit is dominated by shrubland. Grazing and overutilisation rapidly increase the relative abundance of shrubs. Nassella trichotoma (an alien grass species) and Rhigozum obovatum was noted within the overutilised areas due to overgrazing of palatable indigenous grasses. Very little indigenous vegetation were present due to the overutilisation of the veld from sheep grazing the area.

Several Freshwater ecosystems were identified within Soyuz 4 Solar PV Park and within the regulated area The drainage lines located in the Soyuz 4 Solar PV Park are all located on the southern-most part of the site, draining off the higher lying hilly terrain to the south. These drainage lines are typically narrow channelled fluvial features which are not characterised by either a distinct riparian vegetation response in the form of woody vegetation / herbaceous vegetation of different vegetation to the surrounding areas, or of the presence of alluvium within the channel bed – being reflective of their small catchments and limited hydroperiod. This part of the site is characterised by a dense growth of

Rhigozum trichotomum. as well as Aristida spp. grasses, with a relatively sparse vegetation cover. As with all other drainage lines in the wider area these drainage lines flow for very short periods in response to precipitation events of sufficient duration and intensity to generate surface water runoff.

The Online National Web Based Environmental Screening Tool identified a small portion on the western side of the Soyuz 4 Solar PV Park to be in a medium sensitivity area for the Plant Species Theme (Triggering species included Sensitive species Tridentea virescens (Rare)). This species was not found during the site assessment and habitat for this species to occur is unlikely due to the overutilisation of the veld by grazing of sheep. The remainder of the Soyuz 4 Solar PV Park was identified as **low sensitivity** and this was confirmed during the site assessment. For the Terrestrial Biodiversity Theme, the Soyuz 4 Solar PV Park has an overall low sensitivity. The low sensitivity was confirmed and supported during the site assessment.

No threatened SCC (i.e., RDL plants or TOPS), in terms of Section 56(1) of the NEMBA, were recorded during the site assessment. No protected tree species as per the NFA, were identified during the site assessment for the Soyuz 4 Solar PV Park footprint area. The Upper Northern Karoo veld are species-rich in terms of the NCNCA Schedule 2 protected species list, although no protected species were found during the site assessment.

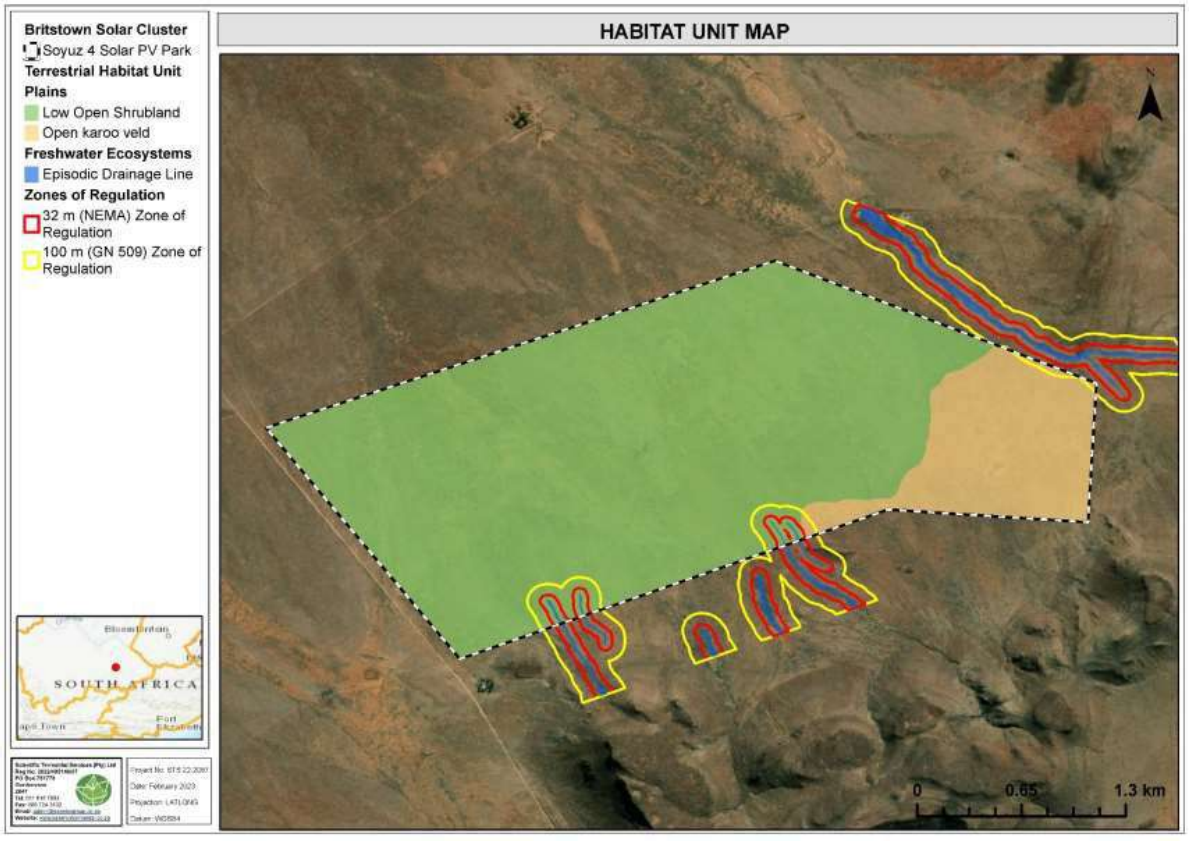


Figure 27 Habitat Unit Map

Fauna

During the site assessment between 16th of January and the 21st of January 2023, several faunal species from different classes were observed within the Soyuz 4 Solar PV Park. One SCC was confirmed within the Soyuz 4 Solar PV Park, as well as suitable habitat for other potential SCC known to occur in the greater area. The below sections provide a brief breakdown of the faunal classes represented in the Soyuz 4 Solar PV Park.

Mammals

Common mammal species such as Cryptomys hottentotus (Common Molerat, LC) were abundant throughout the Soyuz 4 Solar PV with signs of burrows and mounds observed across the site. The only indications of mammal SCC observed were that of the field signs (excavations) of Orycteropus afer (Aardvark, P) that were observed within the Soyuz 4 Solar PV Park. The area falls within the distribution range of a number of other mammal SCC which have the potential to occur within the PVSEF or have been recorded in the immediate surrounding areas. No reptile SCC were observed during the site visit in 2023 although an abundance of common reptile species were observed. Given the available habitat, there is potential for reptile SCC to occur within the Soyuz 4 Solar PV Park. Amphibian populations are likely to be low due to the lack of permanent or seasonal freshwater habitat.

Invertebrates

The Soyuz 4 Solar PV Park is rich in invertebrate diversity, dominated by the following orders: Lepidoptera, Coleoptera and Orthoptera during the 2023 site visit. Invertebrate diversity often follows the floral diversity patterns in dryer regions which has the potential to support more species especially after good rain spells. A number of invertebrate SCC have the potential to occur in the immediate surrounding areas especially the rocky area surrounding the Soyuz 4 Solar PV Park. A single faunal SCC was recorded within the proposed footprint during the field assessments undertaken in 2023, whilst suitable habitat was found for several other species listed under the NCNCA. More information will be provided during the EIA phase. Sensitive habitat types as well as detailed lists of faunal SCC, or species protected under the NCNCA will be provided in the full biodiversity assessment reports.

The Animal Species Theme for the Soyuz 4 Solar PV Park was identified to be of medium sensitivity for the avifaunal Neotis ludwigii (Ludwig's Bustard: EN) species.

7.2.2 Potential Impact Identified

Several potential risks to the receiving environment by the proposed infrastructure development have been identified and are presented in the bullets below:

- Vegetation clearing and construction activities will lead to habitat destruction and disturbance within the direct footprint area and will likely lead to the loss of floral and faunal communities, consequently impacting on the terrestrial biodiversity within the Soyuz 4 Solar PV Park and the immediate surrounding area;
- Vegetation clearing and construction activities may result in the loss of faunal and floral SCC within the directly impacted areas;
- Potential indiscriminate fires by construction personnel may lead to uncontrolled / runaway fires, impacting on floral and faunal communities of the Soyuz 4 Solar PV Park and surrounds;

- Introduction of foreign material (e.g., soil) during construction activities may lead to the further introduction of alien invader species, impacting on the floral characteristics of the Soyuz 4 Solar PV Park and immediate surrounding areas. Failure to implement an alien floral control plan may result in widespread degradation or loss of indigenous flora and fauna within the PVSEF and possibly in surrounding areas;
- Permanent surface scarring may reduce favourable habitat for floral and faunal species;
- Increased personnel on site may result in an increased risk of harvesting/overutilisation of SCC. Moreover, increased personnel within the Soyuz 4 Solar PV Park inherently brings an increased risk of harvesting activities, threatening the current faunal and indigenous floral populations;
- Increased risk of hunting/trapping of local faunal species;
- Potential for poor rehabilitation and monitoring of sensitive habitat that will as a consequence be affected as a result of edge effects associated with the development activities, thereby leading to declines in species diversity; and
- Dust generated by ineffective, or lack of, rehabilitation of exposed areas may impact on the floral characteristics of the property.

Based on the findings of the Biodiversity report before the EAP, the appointed specialist ***has not identified any fatal flaws*** *with the project proposal, and it is reasonable to suggest that* ***the proposed PVSEF is acceptable from a Biodiversity perspective.***

7.3 CLIMATE CHANGE ASSESSMENT

TMG, on behalf of the Applicant appointed Airshed (C/O MS Hanlie Liebenberg – Enslin) (hereinafter referred to as the "Climate Specialist") to undertake a Climate Impact report for the proposed PVSEF.

A Climate Change Assessment (CCA) was conducted to determine the potential long term climate change impacts as a result of the Soyuz 4 Solar PV Park operations. GHG emissions for the project were calculated based on the DFFE 2017 and 2022 Technical guidelines which are based on the Intergovernmental Panel on Climate Change (IPCC) emission factors and country specific nett calorific value and density information. This study considered Scope 1 emissions, which are the emissions directly attributable to the Project and Scope 2 emissions, which are the emissions associated with bought-in electricity. Only Scope 1 emissions need to be quantified to be in line with the DFFE guidelines; the addition of Scope 2 would place the assessment in line with the guidelines provided by the International Finance Corporation (IFC).

The conclusions and recommendations of the assessment are summarised below:

- The region around Britstown where Soyuz 4 Solar PV Park project is proposed to be developed is likely to experience increased temperatures and rainfall events in the future. Climate change impacts will disproportionately affect under-developed communities that lack the physical and financial resources to cope with the physical effects of climate change, such as droughts, floods and increases in diseases.

- Cumulatively, assuming the PVSEF replaces generative capacity from other fossil fuel sources, the facility could contribute to lowering South Africa's GHG emissions from the Energy sector. This is since the PV arrays and BESS provide renewable energy at a lower carbon dioxide equivalent (CO2-e)1[18] emission per unit electricity.

- Based on Soyuz 4 Solar PV Park Scope 1 and Scope 2 GHG emissions, it is the Climate Specialist opinion that the project may be authorised due to its low impact significance, and the positive cumulative downstream impact since the Solar PV facility will have a lower emission per unit compared with the Eskom which is largely dependent on coal fired power stations.

*Based on the findings of the Climate Change report before the EAP, the appointed specialist **has not identified any fatal flaws** with the project proposal, and it is reasonable to suggest that **the proposed PVSEF is acceptable from a Climate Change perspective.***

7.4 FRESHWATER SCOPING ASSESSMENT

TMG, on behalf of the Applicant appointed SAS (C/O Mr Stephen van Staden) (hereinafter referred to as the "Freshwater Specialist") to undertake a Freshwater Impact report for the proposed PVSEF.

7.4.1 Receiving Environment

The site assessment confirmed the presence of eight (8) freshwater ecosystems associated with the study and investigation areas:

- Four episodic drainage lines drain northwards into the study from the investigation area to the south of the study area boundary;
- A further two episodic drainage lines are located in the southern part of the investigation area but do not drain into the study area;
- An episodic drainage and a tributary drainage line drain north-westwards through the eastern part of the investigation area.

The freshwater ecosystems identified were classified according to the Classification System[19] as Inland Systems. The freshwater ecosystems fall within the Nama Karoo Aquatic Ecoregion and the Upper Nama Karoo WetVeg (wetland vegetation) group, classified by Mbona et al. (2015) as "Least Threatened". At Levels 3 (Landscape Unit) and 4 (HGM Type) of the Classification System, the systems were classified as per the summary in Table 11.

[18] *A CO2 equivalent, abbreviated as CO2-e is a metric measure used to compare the emissions from various GHGs on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of CO2 with the same global warming potential.*

[19] *Ollis, D.J., Snaddon, C.D., Job, N.M. & Mbona, N. 2013. Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland Systems. SANBI Biodiversity Series 22. South African Biodiversity Institute, Pretoria.*

Table 11 Levels 3 and 4 Characterisation of the Freshwater Ecosystem

Freshwater Ecosystem HGM Type	Level 3: Landscape unit	Level 4: Hydrogeomorphic (HGM) Type
River (Episodic Drainage Line)	Valley floor—the base of a valley, situated between two distinct valley side-slopes, where alluvial or fluvial processes typically dominate.	Linear landform with clearly discernible bed and banks, which permanently or periodically carries a concentrated flow of water. A river is taken to include both the active channel and the riparian zone as a unit.

The topographical characteristics of the study area and the wider area have an important bearing on the nature and expression of surface water drainage in the landscape. The wider area in the vicinity of the six Soyuz Solar PV Park Cluster 1-6 is generally characterised by areas of very flat topography (plains) interspersed with localised areas of higher-lying and steeper relief in the form of isolated hills (koppies). This is true of the Soyuz 4 Solar PV Park and its surrounds with the majority of the development site occurring on flat or very gently sloping terrain, but with the slope changing significantly in part of the investigation area and in the area to the south. Due to the presence of more steeply sloping terrain in small parts of the investigation area and adjacent areas to the south, surface water drainage is well defined as channelised fluvial features within the hilly, higher lying terrain in the wider area, however it is generally poorly defined or absent on the lower-lying plains.

In many cases, as occurs on parts of the Soyuz 4 Solar PV Park, drainage lines occurring in the wider area rise in areas of steeper, hilly terrain, but completely dissipate and disperse as they reach the plains. In such areas of transition between these two landscape units, physical indications of fluvial hydrology and morphology diminish to the point at which they are absent. In a semi-arid climatic context of relatively low rainfall volumes as well as high evaporation rates, the associated low runoff volumes are unlikely to be able to sustain the development of fluvial systems in such flatter terrain and runoff accordingly diffuses into the flatter terrain, either evaporating and / or infiltrating into the soil profile, potentially recharging the groundwater regime. Typically the area downgradient of the 'termination' point of drainage lines is characterised by deeper sandy (yellow-brown or red apedal) soils. The sandy soils typically are present across a wide lateral area downgradient of the end of the drainage line, with such bands of deeper sandy soils being visible across many parts of the wider area. Although these soils are transported, they lack any alluvial or hydromorphological characteristics. Vegetation within such longitudinal bands of sandy soils downgradient of the end point of drainage lines is characterised by a mix of grasses and dwarf shrubs, along with scattered small shrubs. The vegetation structure and species composition within the longitudinal bands differs from the surrounding areas of shallower soils and calcrete outcropping, but as indicated in many parts of the wider area this change in vegetation structure and species composition is likely to be more related to the presence of deeper sandy soils that increased moisture levels related to surface water drainage.

The exception to this drainage pattern is the drainage line that is located to the east of the study area and which drains parallel to its eastern boundary through the Soyuz 4 Solar PV Park's investigation area. Although this drainage line similarly rises in the hilly terrain to the south of the study and investigation areas, it extends into the plains to the north, remaining distinctly channelled to a point close to the investigation area boundary, beyond which the channel becomes more diffuse and less

distinct. This drainage line extends further to the north as far as the investigation areas of the Soyuz 2 and 3 Solar PV Park sites.

Each part of the study area where drainage was indicated in either national or provincial databases or on the topo-cadastral maps was carefully investigated to confirm the presence or absence of indicators of freshwater ecosystems, as defined above. Certain longitudinal bands of sandy soils on the Soyuz 4 Solar PV Park development footprint displayed the above **absence** of definitive **freshwater ecosystem characteristics** and were accordingly not classified as freshwater ecosystems. Certain desktop databases indicate the presence of a wetland in the south-western part of the study area. No freshwater ecosystems were confirmed to occur in this part of the investigation area. Various indistinct flow paths relating to overland flow off the steeper terrain to the east occur in this area but the area does not display definitive freshwater characteristics. The delineated extent of the freshwater ecosystems relative to the proposed Soyuz 4 Solar PV Park study area and associated investigation area are depicted in **Error! Reference source not found.**.

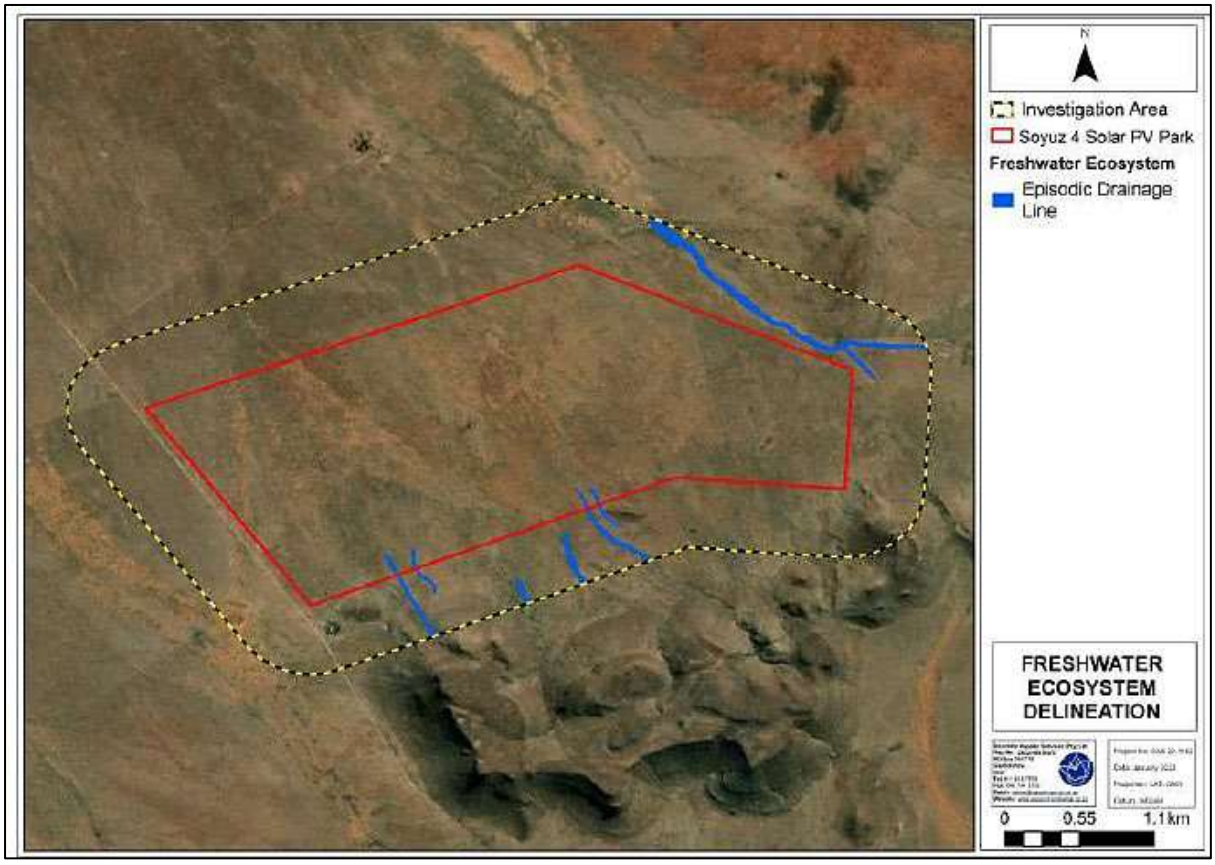


Figure 28 Freshwater Ecosystem Delineation

7.4.2 Potential Impact Identified

There are **five key ecological impacts** on freshwater ecosystems that may potentially occur in relation to the proposed project components, specifically:

1. Altered freshwater ecosystem habitat and ecological structure;
2. Changes to sociocultural and service provision;
3. Altered biotic integrity and disturbance to ecosystem function;
4. Impacts on the hydrology and sediment balance of the freshwater ecosystems; and

5. Altered water quality.

Direct impacts could occur should the footprint of the Soyuz 4 Solar PV Park encroach on the delineated extent of the freshwater ecosystems that area located within the study area, thereby resulting in direct transformation or degradation of freshwater habitat. Indirect and cumulative impacts to the receiving freshwater environments could also occur. Direct impacts **will be able** to be **avoided** on the Soyuz 4 Solar PV Park development site should the footprint of the solar arrays be placed outside of the delineated extent of the drainage lines located on the site, and indirect impacts will be able to be minimised with the implementation of a suitable buffer surround the drainage lines along with application of other mitigation and control measures.

It is important to note that the **four episodic drainage lines** that are located outside of the development site area (study area) will not be subject to the possibility of direct transformative impacts and only indirect impacts will be possible. The larger drainage line that drains north-westward through the investigation area will thus be unlikely to be directly affected which is significant as this drainage line is likely to have a much greater degree of ecological functionality, as elevated ecological and hydrological sensitivity when compared to the smaller episodic drainage lines that are located in the southern part of the study area.

Cumulative Impacts

Freshwater ecosystems within the Karoo and the broader Northern Cape region are under continued threat due a variety of factors primarily related to land use which, in the long term, may prove to be unsustainable. The predominant land use and economic activity in the wider area is commercial livestock farming. This has resulted in degradation of freshwater features due to over-utilisation by livestock, as well a physical transformation of freshwater ecosystems, primarily in the form of impoundments that have been developed along most of the episodic drainage lines in the area. Such impoundments exert various types of impacts, including freshwater habitat transformation, hydrological impacts, as well as hydro morphological impacts. Other factors such as existing linear infrastructure (roads and railways) as well as climate change also exert impacts on the freshwater ecosystems in the wider area and in a Northern Cape Karoo context.

Should the development of the Soyuz 4 Solar PV Park impact freshwater resources located on the development site or those located downgradient of, or adjacent to the study area, this will result in a cumulative impact on the freshwater ecosystems in a wider area, especially at a quaternary catchment or smaller catchment area level. This cumulative impact will be increased in spatial extent and intensity if all of the proposed (six) Soyuz PV Solar Park developments were to impact freshwater ecosystems. The implementation of mitigation measures to avoid impacts (that will be detailed in the EIA-phase freshwater report) will either reduce the scale and intensity of such a cumulative impact, or under a best-case scenario will negate the creation of a cumulative impact.

*Based on the findings of the Scoping Phase Freshwater report before the EAP, the appointed specialist **has not identified any fatal flaws** with the project proposal, and it is reasonable to suggest that **the proposed PVSEF is acceptable from a Freshwater perspective.***

7.5 GEOTECHNICAL RECONNASAINCE ASSESSMENT

TMG, on behalf of the Applicant appointed GEOSS South Africa (C/O Louis Jonk) (hereinafter referred to as the "Geotech Specialist") to undertake the Geotechnical Impact Assessment the proposed PVSEF.

7.5.1 Receiving Environment

Topography and Site Features

The Soyuz Solar PV Park Cluster 1-6 development lies within are characterised mostly by topographically-subdued, flat to very gently hilly terrain with localised topographic highs in the form of butts or ridges formed from negative weathering of more competent Karoo dolerites. All of the proposed sites for the Soyuz Solar PV Park development are situated on topographical lows in the area, with Soyuz 4 Solar PV Park located at an elevation of 1249 to 1312m above mean sea level. Although agriculture is the dominant industry within the area, the landscape in the area has remained relatively unchanged as the regional farming practices are dominated by livestock development. During the summer months, the vegetation is dominated by medium-length grasses and small brushes of the Upper Karoo Bioregion with numerous scattered domical termitaria The study area displays very little bedrock outcrop, except for the margins of local topographic highs, the outward dipping edge of localised ridges, and occasional small borrow pits exploiting Quaternary-age deposits The topography in the region has been classified in terms of development based on classes suggested by Stiff et al. (1996),[20] . The majority of the region is classified as "intermediate" followed by "favourable" due to the flat nature of the site.

Geology

The Council for Geoscience (CGS) has mapped the area at a scale of 1:250 000 scale (2824 Kimberly, GCS 1993). The geological setting is shown in Figure 29 and the main geology of the area is listed in Table 12.

The site is mostly underlain by shale, siltstone and sandstone of the Karoo-aged Tierberg Formation of the Ecca Group, which have been intruded by Jurassic-aged dolerites, and overlain by quaternary-aged surficial cover.

Table 12 Geological Formations

CODE	FORMATION	GROUP	LITHOLOGY
	Quaternary-aged sediments		Alluvium
Jd	Jurassic aged intrusives		Dolerite
Pa	Abrahamskraal	Adelaide	Red and greenish-grey mudstone, subordinate siltstone and sandstone
Pwa	Waterford	Ecca	Sandstones, rhythmites, shales, and mudstones. Structures include wave ripples and slumping

[20] *Stiff, J., S., Croukamp, L., Keyter, G., J., McKnight, C. L., Tromp, B., van Rooy, J. L., Venter, J., P., (1996). Guidelines for Urban Engineering Geological Investigations. South African Association of Engineering Geologists (SAIEG) & South African Institution of Civil Engineers (SAICE): Geotechnical Division, South Africa.*

CODE	FORMATION	GROUP	LITHOLOGY
Pt	Tierberg	Ecca	Grey shale with interbedded siltstones in the upper part

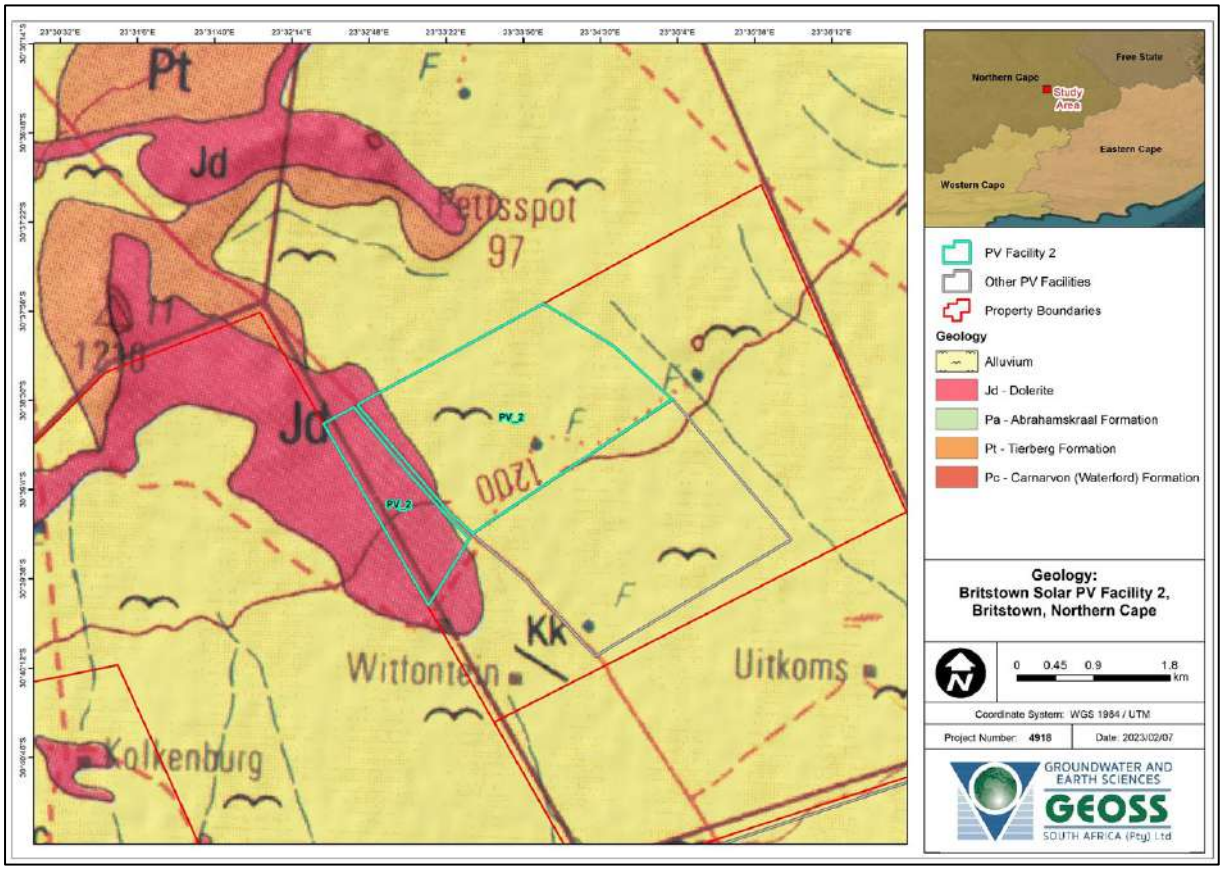


Figure 29 Geological Setting

Soil Type Distribution

Soils refer to the uppermost layer of sediments found within a specific area. Although all soils consist of essentially the same five elements i.e., organic matter, minerals, gasses, liquids, and organisms, varying pedogenic (soil forming) processes can lead to a wide diversity of soil types with large variation in both chemical and engineering properties.

Following the soil distribution maps of Fey (2010)[21] The Soyuz Solar PV Park Cluster 1-6 is located within the following five main soil type distributions (Figure 30).

- Calcic soils – Soft or hardpan, marked carbonate or gypsum enrichment
- Cumulic soils – Incipient soil formation in colluvial, alluvial or aeolian sediment
- Lithic soils - Incipient soil formation on weathered rock or saprolite
- Duplex soils – Marked textural contrast through clay enrichment
- Oxidic soils – Residual iron enrichment through weathering, typically uniform in colour.

[21] *Fey, M., (2010) Soils of South Africa. Cambridge University Press.*

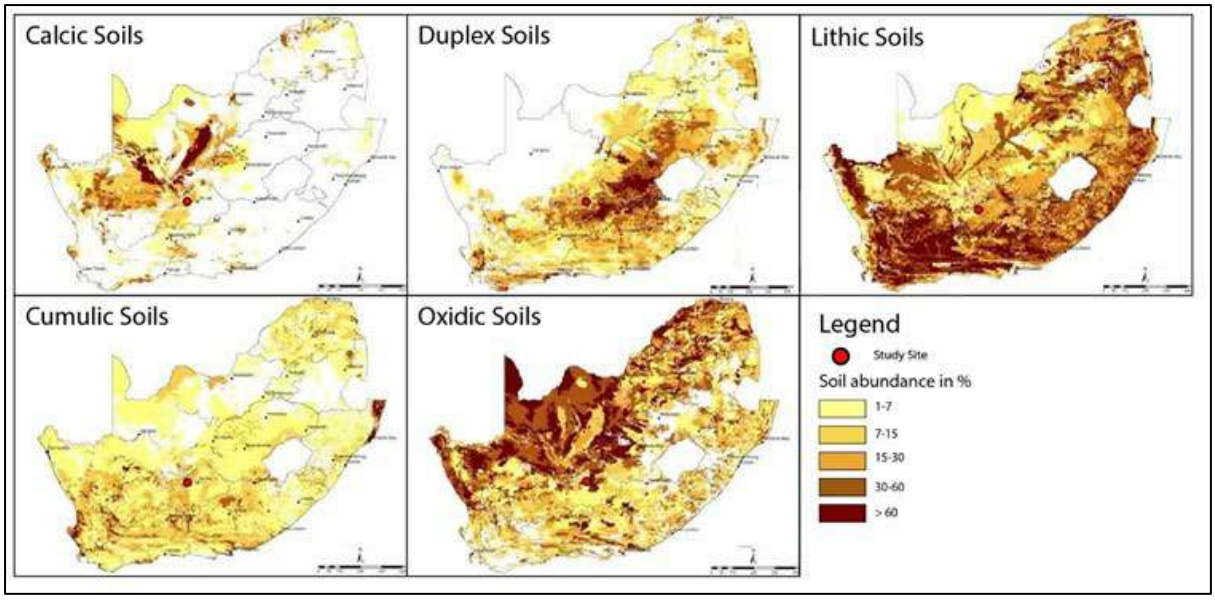


Figure 30 Soil Type Distributions across South Africa

A reconnaissance visit to the site at the end of January confirmed that the major soil types present at the Soyuz 4 PV Solar Park were Cumulic soils and Calcic soils with a strongly developed calcium carbonate horizon within the first-meter depth of the subsoil

Pedocrete Development

Pedocretes describe materials that have formed in situ due to the cementation or replacement of soils by authigenic minerals such as iron or calcium carbonate from direct precipitation out of soil or from groundwater. Pedocretes are fairly common throughout southern Africa and are classified as either indurated (hardpans, honeycombs, nodules) or non-indurated (soft or powdery forms). Brink (1985)[22] compiled a general map of pedocretes distribution across southern Africa, which shows that the Soyuz Solar PV Park Cluster 1-6 is located well within the common distribution of calcrete soils (Figure 31).

The generalised soil profile is provided in Table 13.

Table 13 Generalised Soil Profile

DEPTH (mbgl)	EXPECTED SOIL PROFILE
0.0 to 0.5/1.0	Dry, red to reddish brown, loose to medium dense, fine to medium grained silty **SAND** containing rounded calcrete pebbles**.** This horizon potentially represents the topsoil and transported alluvium.
0.5/1.0 to 1.2/1.5	Laterally discontinuous, hard yet brittle, white calcrete, variably interbedded with 0.1 to 0.2 m thick layers of fine to medium grained red **SAND**
1.2/1.5 to 2.0	Dry, dark grey, highly fractured and friable, unweathered, fine-grained **SHALES** of the Tierberg Formation. Note: Fractures are infilled by calcium carbonate to form a characteristic calcrete-shale honeycomb structure.

[22] *Brink, A. B. A., (1985). Engineering Geology of Southern Africa Volume 4. Building Publications, South Africa. Building Publications, 1985.*

DEPTH (mbgl)	EXPECTED SOIL PROFILE
2.0 to 3.0 (end of profile)	Dry, dark grey, highly fractured and friable, unweathered, fine-grained **SHALES** of the Tierberg Formation.

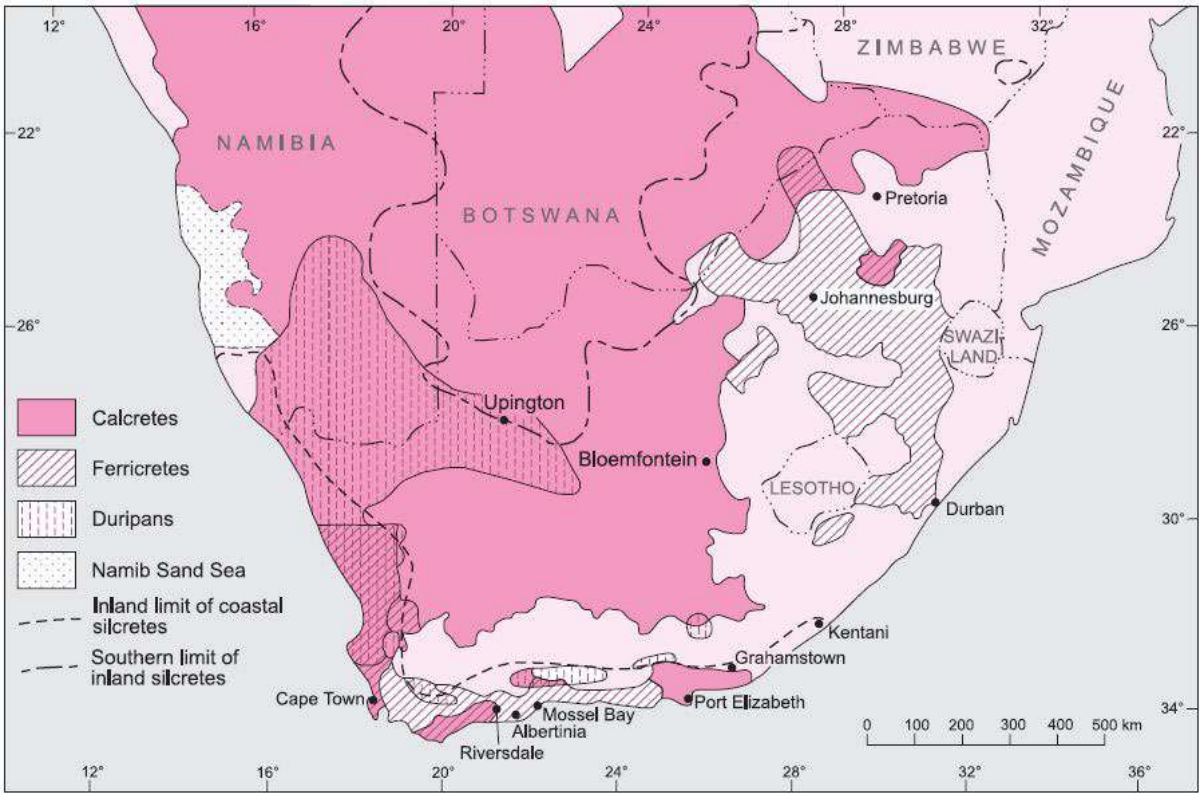


Figure 31 Distribution of Pedocretes across Southern Africa

Hydrogeology

In the region earmarked for development, two aquifer types occur namely intergranular and fractured, and fractured aquifers, with fractured aquifers dominating the area. Both the intergranular and fractured aquifer as well as the fractured aquifer are shown to have an indicative yield potential of 0.5 to 2.0 L/s (DWAF, 2002).[23]

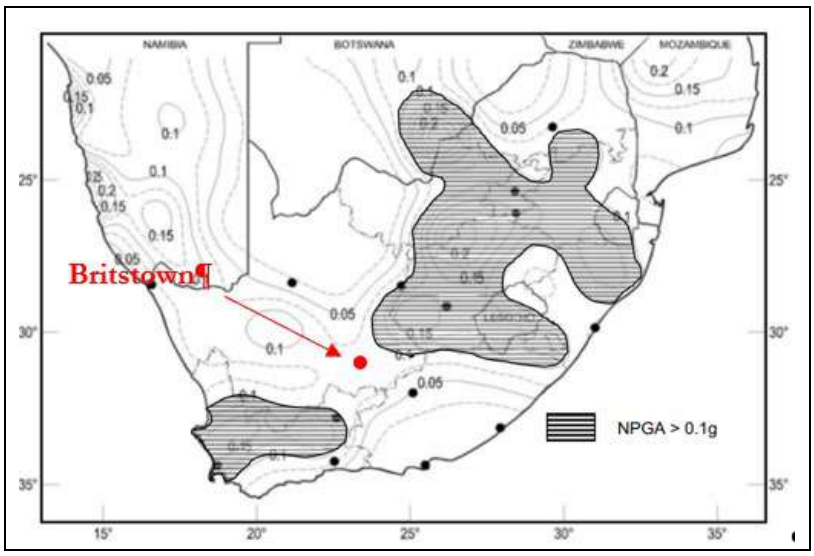
The regional groundwater quality is classified following DWAF (1998) as "marginal" directly underlying the study area with an associated electrical conductivity (EC) of 70 – 300 mS/m (DWAF, 2002).

It should be noted that the above classifications are based on regional datasets, and therefore only provide an indication of conditions to be expected. In field testing will be required to confirm the local water quality and yield potential.

[23] *DWAF (2002). The hydrogeological map series of the republic of South Africa. Beaufort West, 3122. Scale: 1:500 000.*

Seismicity

It is common practise to design structures for seismic loads when the nominal peak horizontal ground acceleration (NPGA) exceeds a 0.1 g once every 475 years[24].



Retief and Dunaiski, (2009) delineated such regions in southern Africa, the approximate position of Britstown is shown in red on Figure 32 relative to these regions.

The region surrounding Britstown is shown to have a nominal peak ground acceleration of less than 0.1g.

Figure 32 Nominal Peak Ground Acceleration Zones

7.5.2 Potential Impact Identified

The impact of the project alternatives on the geological environment will predominantly relate to the impact that the development will have on the soils/rock units beneath the site. The impact of the development and construction, and operation of the proposed Soyuz 4 Solar PV Park activity on the geological environment is limited to topsoil stripping, excavations for pad foundations (if required), trenching, the construction of access roads, and associated light infrastructure. Bulk earthworks, where required for the construction of platforms and access roads, may generate a significant impact on the soils and rocks where construction takes place.

The primary concern associated with geotechnical works is increased soil erosion on site, due to the stripping of vegetation during the construction phase of the project. Removal of vegetation reduces infiltration, thereby increasing runoff yielding increased erosion. Further, compaction during earthworks reduces rainwater infiltration and increases surface runoff and increasing erosion. The construction of paved and/or hard-surfaced areas increases runoff and often localises discharge of stormwater, which may lead to increased erosion and consequently loss of topsoil. Disturbance of the soil may extend beyond the footprint of the structures should such conditions persist for long periods, e.g., more than 10 years.

The impact of the proposed development is expected to be low and is anticipated to have little effect on the site from a geotechnical point of view.

[24] *Retief, J., V., and Dunaiski, P., E., (2009). Background to SANS 10160: Basis of structural design and actions for buildings and industrial structures. Published by SUN MeDIA Stellenbosch.*

Based on the findings of the Scoping Phase Geotechnical report before the EAP, the appointed specialist ***has not identified any fatal flaws*** *with the project proposal, and it is reasonable to suggest that* ***the proposed PVSEF is acceptable from a Geotechnical perspective.***

7.6 HERITAGE SCOPING ASSESSMENT

TMG, on behalf of the Applicant appointed (ACO Associates) (C/O Mr John Gribble) (hereinafter referred to as the "Heritage Specialist") to undertake a Heritage Assessments for the proposed PVSEF

7.6.1 Receiving Environment

The property on which the Soyuz 4 SPV facility is being proposed is rural farmland and is zoned agricultural. Historically the land has been and continues to be used for stock farming.

The Soyuz 4 SPV project site is situated on a largely flat plain. Approximately 1 km south of the PVSEF area there is a substantial line of dolerite hills, and a number of smaller dolerite koppies of dolerite occur both within and just outside the southern edge of the site.

The proposed PVSEF development site is almost entirely covered in the red alluvial sands typical of this part of the Northern Cape. Although the depth of the sand varies, animal burrows noted during the survey indicate that it can be more than a metre thick in places. A seasonal river course lies immediately to the east of the project area but is excluded from the development site footprint.

The vegetation is the grassy, dwarf shrubland typical of the Nama-Karoo biome as can be seen in Figure 33 and Figure 34. The only trees in the landscape are those planted in historical times at small dams installed to water livestock.

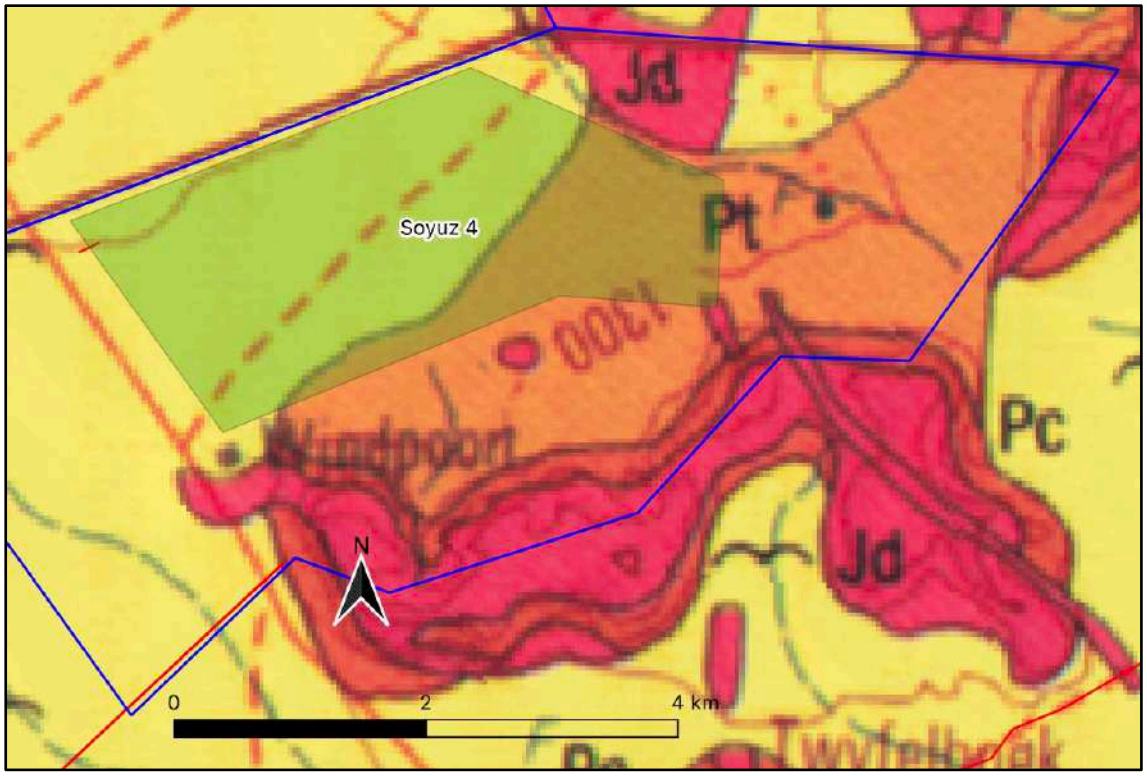
Figure 33 View north across the Soyuz 4 Solar PV Park site

Figure 34 View south-west across the Soyuz 4 Solar PV Park

Palaeontology

According to a comment for this scoping study received from palaeontologist Dr Marion Bamford of the University of the Witwatersrand and the geological mapping, the Soyuz 4 Solar PV Park lies partly on sedimentary shales and sandstones of the Tierberg Formation of the lower Karoo Supergroup and partly on much younger Tertiary limestones and Quaternary sands, both of which can preserve fossils.

The Tierberg Formation sediments date from the mid-Permian, between circa 252 and 299 million years, and are known to contain invertebrate fossils such as fish scales, sponge spiracles and other trace fossils.



Explanation of symbols for the geological map and approximate ages (SG = Supergroup; Fm = Formation; Ma = million years)

SYMBOL	COLOUR	GROUP/FORMATION	LITHOLOGY	APPROXIMATE AGE
	Pale yellow	Quaternary	Alluvium	Quaternary, ca 1.0 Ma to Present
Jd	Red	Jurassic dykes	Dolerite dykes, intrusive	Jurassic, approx. 180 Ma
Pc	Orange	Carnarvon Formation, Ecca Group	Mudstone, siltstone, sandstone	Late Permian
Pt	Pale orange	Tierberg Fm, Ecca Group, Karoo SG	Weathering shale with subordinate siltstone and sandstone	Mid-Permian, ca. 299 – 252 Ma

Figure 35 Extract from the 1:250,000 geological chart of the Britstown area

The Quaternary sand, alluvium and calcrete, are much younger, dating to within the last million years. These sediments may contain transported fossils that originated in the source area of the sediments or have been trapped in palaeo-channels along the modern river valleys. This fossil material will be fragmentary and out of its original context but may, nevertheless preserve important palaeontological information.

SAHRA's palaeo-sensitivity map (see https://sahris.sahra.org.za/map/palaeo) (Figure 36), indicates that the portion of the Soyuz 4 development footprint underlain by Quaternary sediments is of moderate palaeontological sensitivity, but that the Tierberg formation sediments in the south and east of the site are of high sensitivity.

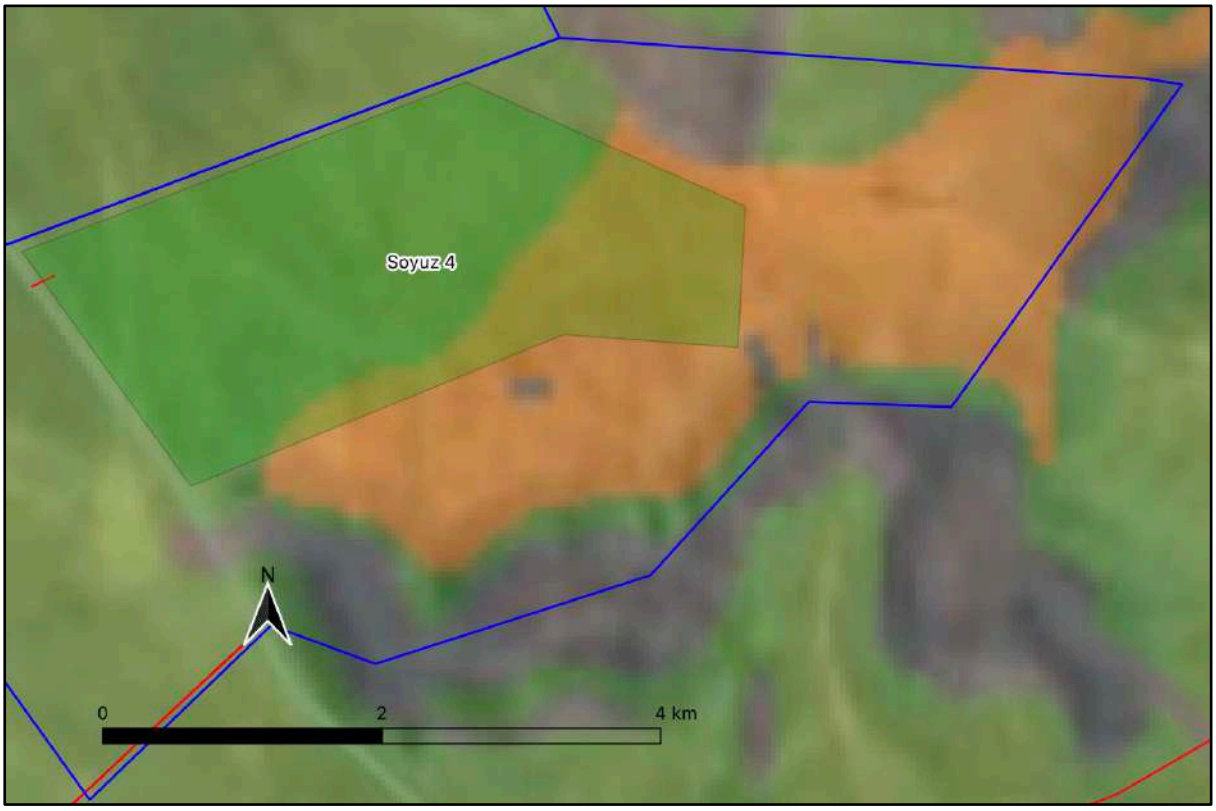


Figure 36 SAHRIS Palaeo-sensitivity Map

Archaeology

East and south of the Soyuz SPV cluster these recent studies are supplemented by the results of what is still South Africa's largest, most intensive archaeological survey: the Zeekoe Valley Archaeological Project (ZVAP) (Figure 28). Between 1979 and 1981, 4,954 km2 of the Seekoei River drainage, between the Sneeuberg in the south and Hanover in the north, was intensively surveyed by a team of archaeologists and the locations of more than 14,000 archaeological stone tool occurrences were recorded (Sampson, 1985). The ZVAP survey, provides a very detailed picture of the spatial distribution of not only pre-colonial archaeological sites spanning the period from the late Early Stone c. 250,000 years ago to within the last 200 years, but also maps landscape features that formed foci for our ancestors' use of the landscape.

The Zeekoe Valley Archaeological Project (ZVAP)[25] results and those from the more recent surveys have allowed the development of a good general understanding of the pre-colonial, Stone Age archaeology in the Karoo and of the likely locations and distribution of sites of different periods within the Karoo landscape. They can be used as an indicator of the likely archaeological sensitivities of Karoo landscapes, including the Soyuz 4 Solar PV Park project area.

Due to the geology of the Karoo, caves and rock shelters are very rare and this means that most Karoo archaeological sites are open sites containing principally stone artefacts. Ostrich eggshell is sometime preserved and, occasionally, pottery on recent sites, but bone is rarely preserved except in rare, stratified contexts. Sites span the full range from the Early and Middle Stone Ages to the contact period between the Later Stone Age inhabitants of the region and the incoming European colonists within the last two centuries.

Potentially archaeologically sensitive areas in the Karoo landscape include:

- Springs, pans and watercourses which were a focus for human activity in the past, and prehistoric and colonial-era archaeological sites may be found around them.
- Outcrops of hornfels which were quarried for stone tool raw material during the Early, Middle and Later Stone Ages.
- Any accessible rock shelter or overhang on the skirts or slopes of hills and mountains. These have the potential to contain rock paintings and/or archaeological deposit.
- Dolerite outcrops and boulders which may contain pre-colonial (and in some instances historical) rock engravings.

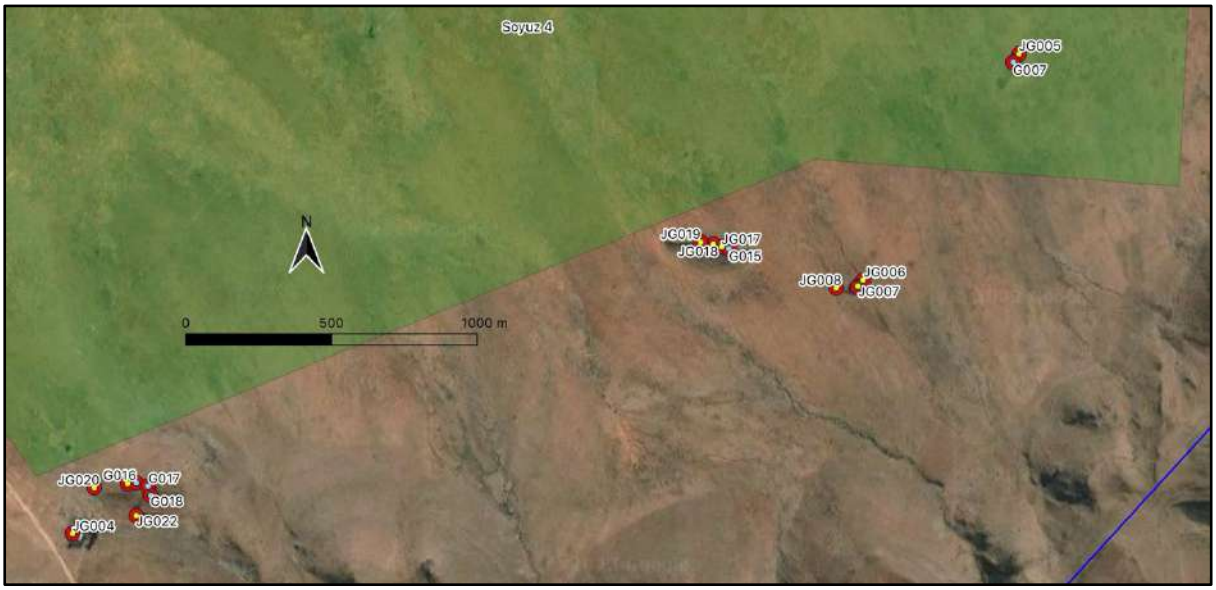


Figure 37 Recorded Heritage Site Locations

Aside from occasional isolated Middle Stone Age (MSA) lithics noted widely spread across the project footprint, the survey found only two archaeological occurrences within the project. Three dolerite

[25] *The ZVAP survey, provides a very detailed picture of the spatial distribution of not only pre-colonial archaeological sites spanning the period from the late Early Stone c. 250,000 years ago to within the last 200 years, but also maps landscape features that formed foci for our ancestors' use of the landscape.*

outcrops south of the PVSEF area were visited to check for archaeology and a number of sites were located on each. The recorded heritage site locations are shown in Figure 37.

Historical Built Environment

A comparison of the earliest 1:250,000 topographic map sheet for the area, which dates from 1966, with modern satellite imagery in a GIS indicates that there are no historical built structures within the project footprint but that the historical Windpoort farmstead is just more than 200 m from the south-western corner of the PVSEF area.

Figure 38 Historical Windpoort Farmstead

Graves and Burials

No graves or burial grounds were recorded within the Soyuz 4 Solar PV Park project footprint.

Cultural Landscape

The cultural landscape within which the PVSEF will be located is not well developed but reflects the recent historical use of the land for stock farming. Its main features are fences, water troughs, wind pumps and occasional farm complexes.

7.6.2 Potential Impact Identified

The main concerns related to the Soyuz 4 Solar PV Park are impacts to palaeontological and archaeological resources and impacts to the cultural landscape.

Aside from the small lithic scatter at JG005 and the rock gong at G007 (see Figure 37) the development footprint appears to contain no significant archaeology. There does remain a small chance that significant buried archaeological sites and/or material could occur on the site, particularly towards the southern edge of the development area.

Although no graves have been identified within the project footprint, it is possible that unmarked burials could be present, particularly in the vicinity of the Windpoort farm complex.

Direct impacts to the historical built environment are unlikely so it has been scoped out of this assessment, but indirect, visual impacts on the Windpoort farm complex are considered later.

The following risks and direct impacts have been identified for the Soyuz 4 Solar PV Park project:

- Construction Phase
    - Potential impacts on palaeontology
    - Potential impacts on archaeology
    - Potential impacts on graves and burials
    - Potential impacts on the cultural landscape.
- Operational Phase
    - Potential impacts on the cultural landscape.
- Decommissioning Phase
    - Potential impacts on the cultural landscape.
- Cumulative Impacts
    - Potential impacts on palaeontology
    - Potential impacts on archaeology
    - Potential impacts on graves and burials
    - Potential impacts on the cultural landscape.

Potential impacts on palaeontology

Activities associated with the construction and decommissioning of the PVSEF project may disturb or destroy fossil material within the Tierberg formation sediments and the more recent Quaternary sediment that together cover the site. However, the potential for fossils in these sediments is very variable and significance of impacts palaeontological resources would thus be low negative, but very low negative with the implementation of mitigation measures

Potential impacts on archaeology

Archaeological sites and/or materials may be affected during activities associated with the construction and decommissioning of the PVSEF project. Most of the archaeological material identified within the project footprint is of very low cultural significance, but the small lithic scatter at JG005 and the rock gong at G005 has been graded 3C and 3A. The significance of impacts on the known archaeological would thus be low negative, but very low negative with the implementation of mitigation measures

Potential impacts on graves and burials

Human graves or burials could be impacted almost anywhere on the site, but the probability of this happening during activities earthworks associated with the construction and decommissioning of the

PVSEF project is extremely low and the significance rating is thus very low negative both without and with the implementation of mitigation measures.

Potential impacts on the cultural landscape

The cultural landscape is likely to be the heritage resource most affected by the construction of the SPV facility, but given that it is of low cultural significance, the potential impact is assessed to be low negative.

*Based on the findings of the Scoping Phase Heritage report before the EAP, the appointed specialist **has not identified any fatal flaws** with the project proposal, and it is reasonable to suggest that **the proposed PVSEF is acceptable from a Heritage perspective.***

7.7 NOISE SCOPING ASSESSMENT

TMG, on behalf of the Applicant appointed dbAcousatics (C/O Mr Barend van der Merwe) (hereinafter referred to as the "Noise Specialist") to undertake a Noise Impact report for the proposed PVSEF.

7.7.1 Receiving Environment

The preparation and provision of infra-structure for the Soyuz 4 Solar PV Park project (project area) will be the main noise sources during the construction, operational phase and the decommissioning phases of the project which may have a cumulative impact on the prevailing ambient noise level. This will however be assessed during the EIA process. The rehabilitation activities during the decommissioning phase may have a temporarily impact on the environment.

The following noise sources prevail in the vicinity of the project area:

- Agricultural seasonal noise;
- Traffic – hauling vehicles, busses, and motor-vehicles along the abutting feeder N10 and/or gravel roads;
- Intermittent train noise.

7.7.2 Potential Impact Identified

Potential noise impacts which may be associated with the project, and which will be investigated as part of the specialist investigations and environmental Noise Impact Assessment phase:

Construction phase

- Civil construction;
- Removal of topsoil;
- Construction of waste/overburden/rock dump sites;
- Infra-structure construction;
- Increased traffic.

Site clearing and grubbing of footprint

Noise may be generated by the construction activities and the use of construction equipment such as Graders, TLB's and Front-end loaders. The use of this equipment will create an increase in noise levels in the immediate vicinity of the construction activities and in some cases at some distance from the activities.

Construction activities of the PV modules at Soyuz 4 Solar PV Park.

Noise could be generated by the following activities: earth drilling, generator noise and civil construction.

Construction of the infra-structure

The construction of the BESS, O&M building, Sub-station, roads may generate localised noise increase in particular the use of cranes and generators during the assembly stage of the sub-station and/or batteries.

Construction activities of the roads to and from the sites

Construction roads to and from the site would create a temporary linear noise source.

Operational phase

- BESS activities;
- Inverter noise;
- Sub-station noise;
- Additional traffic to and from the Soyuz 4 Solar PV Park;

It is important that interactions that could lead to potential impacts which may result from the project aspects, or interactions that could lead to potential impacts which may be intensified as a result of the project aspects, during the construction, operational and closure phases (including potential areas of impact) to assist in focusing the specialist investigations.

Decommissioning phase:

- Planting of grass and vegetation at the rehabilitated areas;
- Removal of infra-structure.

*Based on the findings of the Scoping Phase Noise report before the EAP, the appointed specialist **has not identified any fatal flaws** with the project proposal, and it is reasonable to suggest that **the proposed PVSEF is acceptable from a Noise perspective.***

7.8 SOCIAL SCOPING ASSESSMENT

TMG, on behalf of the Applicant appointed Tony Barbour Environmental Consulting South Africa (C/O Tony Barbour) (hereinafter referred to as the "Social Specialist") to undertake the Social Impact Assessment for the proposed PVSEF.

7.8.1 Receiving Environment

Demographic Overview

Population

The population of the ELM in 2016 was 45 404. Of this total, 36.4% were under the age of 18, 57.9% were between 18 and 64, and the remaining 5.8% were 65 and older. The ELM therefore has a relatively large young population. This creates challenges in terms of creating employment opportunities. In terms of race groups, Coloureds made up 60.9% of the population, followed by Black Africans (32%) and Whites (6.9%). The main first language spoken in the ELM was Afrikaans (69.6%), followed by IsiXhosa (26.5%) and English (0.9%).

Britstown falls within Ward 8 of the ELM. The population of Ward 8 in 2011 was 4 448. Of this total, 32.53% were under the age of 18, 61.3% were between 18 and 64, and the remaining 6.2% were 65 and older. Like the ELM, Ward 8 also had a relatively large young population. In terms of race groups, Black Africans made up 44.3% of the population, followed by Coloureds (39.2%) and Whites (15.1%). The main first language spoken in the Ward 8 was Afrikaans (55.3%), followed by IsiXhosa (34.2%) and English (2%).

The high percentage of young people in both the ELM and Ward 8 means that a large percentage of the population is dependent on a smaller productive sector. The dependency ratio is the ratio of non-economically active dependents (usually people younger than 15 or older than 64) to the working age population group (15-64). The higher the dependency ratio the larger the percentage of the population dependent on the economically active age group. This in turn translates reduced revenue for local authorities to meet the growing demand for services. The national dependency ratio in 2011 was 52.7%, similar to that of the Northern Cape Province (55.7%). The dependency ratio for the ELM (2011) was 60.4%. The traditional approach is based people younger than 15 or older than 64. The 2016 information provides information for the age group under 18. The total number of people falling within this age group will therefore be higher than the 0-15 age group. However, most people between the age of 15 and 17 are not economically active (i.e., they are likely to be at school).

Using information on people under the age of 18 is therefore likely to represent a more accurate reflection of the dependency ratio. Based on these figures, the dependency ratio for the ELM in 2016 and Ward 8 (2011) was 72.8% and 63% respectively. This figure is significantly higher than the national and provincial levels in 2011 (52.7% and 55.7% respectively). The higher dependency ratio reflects the limited employment opportunities in the area and represent a significant risk to the district and local municipality. The high dependency ratio also highlights the importance to maximising local employment opportunities and the key role played by training and skills development programmes.

Households and house types

Based on the information from the 2016 Community Survey there were a total of 11 992 households in the ELM and 1 200 in Ward 8 (2011). Most of the households reside in formal houses (74.2% ELM and 92.5% Ward 8). The figure for the ELM is similar to the District (78.1%) and Provincial (74.4%) figures. Approximately 17% of the households in the ELM reside in backyard flats and a further 4.2% in informal shacks. For Ward 6 only 1.2% lived in shacks. Only 1.7% of the households in Ward 8 resided in shacks in 2011.

Based on the information from the 2016 Community Household Survey 39.8% of the households in the ELM are headed by females compared to 31.3% for Ward 8 (2011). The figure for ELM was similar to the District and Provincial figures of 37% and 39% respectively. The high number of female-headed households at the local municipal and ward level reflects the lack on formal employment and economic opportunities in the ELM. As a result, job seekers from the ELM need to leave the areas to seek work in the larger centres. As indicated above, this highlights the importance to maximising local employment opportunities and the key role played by training and skills development programmes.

The majority of the job seekers are likely to be males. This is due to traditional rural patriarchal societies where the role of the women is usually linked to maintaining the house and raising the children, while the men tend to be the ones that migrate to other areas in search of employment.

Household income

Based on the data from the 2011 Census, 9.1% of the population of the ELM had no formal income, 3.3% earned less than R 4 800, 4.9% earned between R 5 000 and R 10 000 per annum, 18.2% between R 10 000 and R 20 000 per annum and 22.4% between R 20 000 and 40 000 per annum (2011). The figures for Ward 8 were 11.1%, 1.9%, 3.5%, 19.1 and 20.6%. The poverty gap indicator produced by the World Bank Development Research Group measures poverty using information from household per capita income/consumption. This indicator illustrates the average shortfall of the total population from the poverty line. This measurement is used to reflect the intensity of poverty, which is based on living on less than R3 200 per month for an average sized household (~ 40 000 per annum). Based on this measure, in the region of **57.9% of the households in the ELM and 56.2% in Ward 8 live close to or below the poverty line.** While this figure is lower than the provincial level of 62.9%, the low-income levels reflect the limited employment opportunities in the area and dependence on the agricultural sector. This is also reflected in the high unemployment rates. As indicated above, this highlights the importance to maximising local employment opportunities and the key role played by training and skills development programmes.

The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the ELM. This in turn impacts on the ability of the ELM to maintain and provide services.

The Integrated Development Plan (IDP) for the ELM indicates that the total number of indigent households within the municipal area increased from 2 726 households as of 30 June 2014 to 2 874 as at April 2017 and about 3 594 households during January 2016/17. The COVID-19 pandemic is likely to have resulted in an increase in the number of indigent households in 2020 and 2021.

Employment

The official unemployment figure in 2011 for the ELM was 14.5%. The figures also indicate that the majority of the population are not economically active, namely 43.7%. These figures are similar to the official unemployment rate for the Northern Cape Province (14.5%) and Pixley ka Seme District (14.8%). This reflects the limited employment opportunities in the area, which in turn are reflected in the low income and high poverty levels. Given the impact of COVID-19 pandemic, the unemployment

levels are likely to be higher in 2021. The figures for Ward 8 were 7.8% (unemployed) and 49.2% not economically active.

Education

In terms of education levels, the percentage of the population over 20 years of age in the ELM with no schooling was 17.4% in 2011, compared to 7.9% for the Northern Cape Province and 11.9% for the District. The percentage of the population over the age of 20 with matric was 28.3%, compared to 29.1% for the Province and 25.3% for the District. Only 1.5% and 1.4% of the population over the age of 20 years in the ELM had an undergraduate and postgraduate qualification, respectively. The relatively poor education levels in the ELM pose a potential challenge to the implementation of an effective training and skills development programme for local community members. The figures for Ward 8 (2011) were 8.6% with no schooling, 29.2% with matric and 2.3% and 1.2% with an undergraduate and postgraduate degree respectively. The figure for matric was similar to the provincial figure and higher than the district level.

Municipal Services

Access to Electricity

Based on the information from the 2016 Community Survey 96.6% of households in the ELM had access to electricity. Of this total 88.4% had inhouse prepaid meters. No data was available for Ward 8.

Access to water

Based on the information from the 2016 Community Survey 96.7% of households in the ELM were supplied by a regional or local service provider. However, only 53.2% of the households had piped water inside their houses, while 44.3% relied on piped water inside the yard. The figures for the District were 45.8% and 44.4% respectively. Only 45.3% of households in the Northern Cape Province have piped water inside their homes. For Ward 8, 80.6% of households were supplied by the local service provider and 17% relied on boreholes, which reflects the rural nature of Ward 8.

Sanitation

Based on the information from the 2016 Community Survey, 95.3% of households in the ELM had access to flush toilets, 2.1% rely on pit latrines, 1.5% use bucket toilets, while 0.5% had no access to toilet facilities. The figures in terms of access to flush toilets are higher than provincial (71.4%) and District (82.8%) figures. For Ward 8 81.1% of households had access to flush toilets and 5% had no access to toilets. 8.9% relied on pit latrines.

Refuse collection

Based on the information from the 2016 Community Survey, 79.8% of households in the ELM had their refuse collected on a regular basis by a local authority of private company, 4.6% use their own dumps, and 8.7% are not serviced. For Ward 8, 77.8% of households were provided with a regular service while 14% relied on their own dump.

Health and Community Facilities

The PKSDM is served by 3 District Hospitals, 8 Community Health Centres, 28 Primary Health Care Clinics, 4 satellite clinics and 1 mobile clinic, distributed over the district. The ELM has 1 District Hospital and 6 Primary Health Care clinics. There are no community health centres within ELM that provide a 24hour service. A new hospital was built in De Aar and was opened in 2017. The Central Karoo Hospital serves as the referral hospital for the district. Minor operations are performed at the facility. Specialists visit the district on a monthly basis from Kimberley Hospital Complex. In terms of education the ELM has 16 schools of which 13 are no-fee schools. The ELM also has libraries.

Economic Overview

Agriculture

Agriculture is the key economic sector in the PKSDM and ELM. Many of the towns within the district municipal area function mainly as agricultural service centres, with the level of services provided at the centres to a large extent reliable on the intensity of the farming practices in the surrounding area. Despite the largely semi-arid and arid environment in the district, the fertile land that lies alongside the Orange, Vaal and Riet Rivers supports the production of some of the country's finest quality agricultural products, including grapes and vegetables. The main livestock farming in the region include cattle, sheep, and goat farming. Game breeding has also been identified as one of the opportunities which could be linked with the tourism sector for Game reserves and hunting activities. However, despite the key role played by agriculture there is limited value adding to the farming products within the district and the area is prone to droughts and climate change.

Mining

The main deposits in Pixley ka Seme include alluvial diamond mining along the Orange River and various semi-precious stones, such as tiger-eye and zinc deposits. The region also has various saltpans for the potential of salt production. Uranium deposits also occur in the district.

Tourism

The tourism sector in the district contributes 15.6% to the provincial gross value added (GVA). The municipalities Emthanjeni, Kareeberg, Umsobomvu and Siyancuma municipalities are the biggest contributors to the provincial gross value added (GVA). The PKSDM IDP notes that the tourism opportunities in the district will increase due to the Karoo Array Telescope (KAT), a project being driven at a national level. Of relevance, the PKSDM notes that care needs to be taken with developments that have the potential to negatively impact on the Karoo landscapes.

Renewable energy

Of key relevance the PKSDM IDP identifies renewable energy as key economic sector and refers to the substantial socio-economic development (SED) and enterprise development (ED) contributions leveraged by the IPPPP commitments. The IDP notes that the towns of Prieska and Carnarvon have in recent years changed character from small rural towns to potentially regional hubs as a result of investments in renewable energy generation and the Square Kilometre Array (SKA) radio telescope project, respectively.

7.8.2 Potential Impact Identified

Construction Phase Social Impacts

The following key social issues are of relevance to the construction phase:

Potential positive impacts

- Creation of employment and business opportunities, and opportunity for skills development and on-site training.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Impacts related to the potential influx of jobseekers.
- Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site.
- Increased risk of grass fires associated with construction related activities.
- Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles.
- Impact on productive farmland.

Operational Phase Social Impacts

The following key social issues are of relevance to the operational phase:

Potential positive impacts

- The establishment of infrastructure to improve energy security and support renewable sector.
- Creation of employment opportunities.
- Benefits to the affected landowners.
- Benefits associated with the socio-economic contributions to community development.

Potential negative impacts

- Visual impacts and associated impacts on sense of place.
- Impact on property values.
- Impact on tourism.

The findings of the Scoping level SIA indicate that the development of the proposed Soyuz 4 Solar PV Park PV SEF and associated infrastructure will create employment and business opportunities for the ELM during both the construction and operational phase of the project. All of the potential negative impacts, with the exception of the impact on sense of place, can also be effectively mitigated.

The establishment of a Community Trust will also benefit the local community. The enhancement measures listed in the report should be implemented in order to maximise the potential benefits. The significance of this impact is rated as High Positive. The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the negative environmental and socio-economic impacts associated a coal-based energy economy and the challenges created by

climate change, represents a significant positive social benefit for society as a whole. The Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) has resulted in significant socio-economic benefits, both at a national level and at a local, community level. These benefits are linked to foreign Direct Investment, local employment and procurement and investment in local community initiatives. The establishment of the proposed Soyuz 4 Solar PV Park is therefore supported by the findings of the Scoping level SIA.

*Based on the findings of the Scoping Phase Social report before the EAP, the appointed specialist **has not identified any fatal flaws** with the project proposal, and it is reasonable to suggest that **the proposed PVSEF is acceptable from a Social perspective.***

7.9 SOIL, LAND USE AND LAND CAPABILITY SCOPING ASSESSMENT

TMG, on behalf of the Applicant appointed SAS (C/O T. Setsipane) (hereinafter referred to as the "Agricultural Specialist") to undertake the Agricultural Impact Assessment for the proposed PVSEF

7.9.1 Receiving Environment

Current Land Use

According to observations made during the site assessment the study area largely comprises of the Karoo and Fynbos shrubland vegetation associated with wilderness land use as well as livestock grazing, with limited anthropogenic impact. At the time of assessment, no cultivation of crops was observed within the boundaries of the study areas as well as in the immediate vicinity, however livestock is the dominating agricultural activity.

Dominant Soil Forms

The identified soil forms within the study area include the soils of Coega, Mispah and Askham/Clovelly formation.

The Askham/Clovelly soil form is characterised by an orthic A horizon underlain by a yellow brown apedal horizon and by either a hard carbonate or/and lithic horizon. These soils are associated with low-activity clays (kaolinite mineral) synonymous with weak and apedal soils related to sandy textured soils. These soils account for approximately 348.0 ha (56.5%) of the entire development footprint and are considered ideal for cultivation due to:

- Good drainage characteristics;
- Sufficient depth for root growth;
- Sufficient moisture holding capacity; and
- Nutrient retention capacity to support the optimum growth and production.

The Coega soil forms are typically shallow in nature and are characterised by the presence of an orthic A horizon underlain by the hard carbonate horizon. Hard carbonate horizons can be massive, vesicular or platy in nature and typically contain calcium and/or magnesium carbonates with a hard to extremely hard consistence. These soils are typically not suitable for cultivation due to a shallow effective rooting depth, high pH, high alkalinity, low nutrient availability, stoniness and low moisture

retention due to the sandy nature of the soils. However, these soils can be cultivated under intensive management strategies by breaking of the hard carbonate and dorbank horizons to improve drainage and rooting depth with the presence of an irrigation scheme. Despite these limitations, the choice of crop is still limited to certain pome fruit varieties. Thus, these soils are generally restricted to intensive grazing and wildlife.

The Mispah soil types is associated with poor physical properties for plant root system penetration and water infiltration, due to the shallow nature of the soil and/or limiting impeding layer of the underlying parent material. Based on the degree of weathering some lithic material of varying sizes can be mixed closely with soil material. These types of soils are usually avoided for intensive use and thus left for grazing, forestry, and wildlife land uses.

Land Capability Classification

For this assessment, land capability was inferred in consideration of observed limitations to land use due to physical soil properties and prevailing climatic conditions. Climate Capability (measured on a scale of 1 to 8) was therefore considered in the agricultural potential classification. The study area falls into Climate Capability Class 7 due a severely restricted choice of crops due to heat, cold and/or moisture stress. The identified soils were classified into land capability and land potential classes using the Camp et. al, and Guy and Smith Classification system (Camp et al., 1987; Guy and Smith, 1998), and this is shown in Table 14.

Table 14 Land Capability and Potential Classifications

SOIL FORM	LAND CAPABILITY	LAND POTENTIAL	AREA (ha)	PERCENTAGE (%)
Askham/Clovelly	Arable (Class III)	Restricted Potential (L5)	348.0	56.5
Coega/Mispah	Grazing (Class V)	Very Restricted Potential (L6)	148.2	24.1
Mispah	Grazing (Class V)	Very Restricted Potential (L6)	119.8	19.4
Total Enclosed			*616*	*100*

The identified soil forms with respect to agricultural use are depicted in Figure 39.

Arable (Class III)

The identified soil forms are of moderate (Class III) land capability, and suitable for arable agricultural land use with restrictions. Therefore, these soils are considered to potentially make a moderate contribution to agricultural productivity on a regional and national scale.

Grazing (Class V)

The identified Glenrosa soil forms are of poor (Class VI) land capability and are not suitable for arable agricultural land use. Theses soils are, at best, suitable for natural pastures for light grazing. Therefore, these soils are not considered to make a substantial contribution to extensive subsistence farming on a local scale.

Figure 39 Land Capability of the Soil Forms

7.9.2 Potential Impact Identified

In addition to the loss of growth medium (stripped soils), the soils are anticipated to be exposed to erosion, dust emission, and potential soil contamination impacts during the construction phase of the proposed development; and these impacts may persist for the duration of the operational phase if not mitigated adequately.

Based on the findings of the Scoping Phase Soil, Land Use and Land Capability report before the EAP, the appointed specialist ***has not identified any fatal flaws*** *with the project proposal, and it is reasonable to suggest that* ***the proposed PVSEF is acceptable from a Soil, Land Use and Land Capability perspective.***

7.10 TOWN PLANNING SCOPING ASSESSMENT

TMG, on behalf of the Applicant appointed Warren Petterson Planning (C/O MS Soné vd Merwe) (hereinafter referred to as the "Town Planning Specialist") to undertake a town planning report for the proposed PVSEF.

The subject farm is zoned Agricultural Zone 1 in terms of the Emthanjeni Local Municipality Land Use Scheme, 2022. According to the scheme regulations, no provision is made for renewable energy facilities on land zoned Agricultural Zone 1.

The footprints of the proposed Soyuz 4 Solar PV Park will have to be rezoned to "Renewable Energy Plant Zone", under which specific development controls will be imposed pertaining to the solar energy

facility. Therefore, a rezoning application (land use application) to the local authority will be required in terms of Section 3(2)(i) of Emthanjeni Municipality Spatial Planning and Land Use Management By-Law, 2015 to allow for the proposed PVSEF.

It must be noted that the rezoning application can only be finalized and submitted for consideration once the Environmental Authorization is granted. It is advised that the rezoning application be submitted after the Environmental Authorization is granted as the layout and site development plan will be impacted during this process after input from all the relevant specialists and government departments is received.

Based on the findings of the Town Planning report before the EAP, ***the appointed specialist has not identified any fatal flaws with the project proposal****, and it is reasonable to suggest that* ***the proposed PVSEF is acceptable from a Town Planning perspective****.*

7.11 TRAFFIC SCOPING ASSESSMENT

TMG, on behalf of the Applicant appointed ITS Engineers (Mr Pieter Arrangie)) (hereinafter referred to as the "Traffic Impact Specialist") to undertake a Traffic Impact Assessments for the Proposed PVSEF

7.11.1 Receiving Environment

Existing Road Network

Major roadways in the vicinity of the proposed development are the N14 (National Road) and R358 (Provincial Road). The existing roadway characteristics are summarised in Table 15.

Table 15 Major Roadways

ROADWAY	TYPE OF ROAD	SPEED LIMIT (km/h)	ROAD SURFACE
N12	National Road	120	Paved/Tar
Windpoort Road – Britstown to Site	Provincial Road	60	Gravel

Existing Cross Sections and Surface Conditions

The N12 has a typical rural formation of a National Road, paved with one lane per direction of travel with shoulders along both sides of the road in the site vicinity. The lanes are 3.7m wide with 2m wide shoulders. The surface condition of the N12 in the site vicinity is adequate. Windpoort Road is 8m wide gravel road. The road surface of sections of the road in the site vicinity is poor condition.

Existing Traffic Volumes

Existing traffic conditions are based on the traffic volumes extracted from the SANRAL Comprehensive Traffic Observation (CTO) Stations and Provincial count stations in the area. Table 16 illustrates the current average daily traffic volumes (ADT) and the average daily truck traffic volumes (ADTT) and the peak hour volumes on the road network in the wind farm site vicinity.

Table 16 Existing Traffic Conditions

ROADWAY	AVERAGE DAILY TRAFFIC (ADT) VOLUMES	AVERAGE DAILY TRUCK TRAFFIC VOLUMES	PEAK HOUR VOLUME	% HEAVY VEHICLES
N12	885	355	85	40%
Windpoort Road – Britstown to Site	<50	<5	Not Applicable	10%

The existing traffic volumes along the surrounding road network are low and the existing traffic volumes will not be any reason for concern in terms of the expected transport impact associated with the proposed development.

Existing Access

Construction access to the site will be via existing and new access roads created off Witpoort Road. The construction accesses should be located at positions with clear site lines along the road to ensure shoulder sight distance of at least 300m along the road from the access positions. The access locations will be confirmed during the assessment phase.

7.11.2 Potential Impact Identified

Issues and Concerns

Road surfaces

During the construction phase of the proposed development, an increase in normal and heavy vehicle traffic is expected along the roads in the site vicinity. The surge in traffic volumes will result in an increased impact during the construction phase. Some sections along Witpoort Road might require resurfacing to accommodate the higher traffic volumes during the construction phase, the specific areas will be confirmed during the assessment phase. The road should be monitored for any surface and or structural damage to the layer works as a result of the additional traffic during the construction phase.

Roadway Capacity

The trip generation for the site will be low during the operational phase of the project and slightly higher during the construction phase of the project. The actual impacts must be determined during the final evaluation. However, there will be sufficient capacity on the road network in the site vicinity to accommodate the additional trips associated with the proposed development. Intersection layouts must be determined during the assessment phase.

Findings and Recommendations

Based on the scoping evaluation of the proposed site the following findings are relevant:

- Access to the site is possible and feasible.

- Haul routes to the site can be identified and is possible via national and provincial roads to the site.
- The existing major roadways have adequate capacity to accommodate construction as well as operational traffic.
- The site access roads will have to be constructed to an acceptable standard to accommodate the construction vehicles.

The following is recommended:

- Construction and operational traffic impacts to be evaluated during the evaluation phase.
- The roads should be monitored during the construction phase for possible damage to the road surface and/or layer works to prevent permanent damage to the road.

*Based on the findings of the Scoping Phase Traffic Assessment report before the EAP, the appointed specialist **has not identified any fatal flaws** with the project proposal, and it is reasonable to suggest that **the proposed PVSEF is acceptable from a Traffic perspective.***

7.12 VISUAL SCOPING ASSESSMENT

TMG, on behalf of the Applicant appointed SAS (C/O S. Erwee) (hereinafter referred to as the "Visual Specialist") to undertake the Visual Impact Assessment for the proposed PVSEF

7.12.1 Receiving Environment

Land Use and Visual Receptors

The Soyuz 4 Solar PV Park is situated in open dwarf karoo shrub veld that is utilised for grazing, with bare patches on gently sloping terrain with a mountainous backdrop. The arid nature of the climate restricts stocking densities which has led to relatively large farms across the landscape, resulting in the area being sparsely populated. Agricultural practices, mostly cattle and sheep grazing, dominate the land use of the area. There are only six farmsteads located within the visual assessment zone, of which only two will experience a visual impact from the Soyuz 4 Solar PV Park. As such, the farmsteads are considered highly sensitive receptors, and thus according to the SEAs Identification of No-Go Areas (negative mapping) (2019) a 300m buffer is recommended.

According to SAPAD (2022) and SACAD (2022) the Soyuz 4 Solar PV Park is not located within a 10 km radius of any protected or conservation areas. Since the Soyuz 4 Solar PV Park is situated within a remote area, the only roads present within a 5 km radius are farm roads, which are utilised infrequently and predominantly by the farmers and workers. Due to their momentary views and experience of the receiving environment motorists are classified as low sensitive receptors. The gravel road forming the western boundary of the Soyuz 4 Solar PV Park may however be considered an important passage as it connects Britstown and Deelfontein, and if the proposed PV panels are situated directly adjacent to the road, the possible glint and glare from the PV panels may distract the motorists, possibly resulting in an accident. Therefore, a 250m buffer was recommended for the gravel road, where no PV panels should be placed.

The R398 roadway is located approximately 13,7 km southwest of the Soyuz 4 Solar PV Park, while the N12 national road is located approximately 6,4 km west of the Soyuz 4 Solar PV Park and the N10 national road is located approximately 4,4 km to the north. With the national routes located quite a distance from the Soyuz 4 Solar PV Park, and the undulating topography of the area rendering no visibility of the Soyuz 4 Solar PV Park, these routes will not be affected by the proposed Soyuz 4 Solar PV Park, therefore the buffers applicable to national routes according to SEAs are not relevant to this project.

Visual Absorption Capacity (VAC)

The VAC of the area is considered moderately low, indicating that the proposed PV structures will stand out, to a degree. With the vegetation of the area being short and no roadside tree lines the vegetation will not obscure the view. The mountain ranges in the background will however assist in absorbing the silhouettes, if any, of the PV panels and associated infrastructure. Furthermore, the relatively low height of the PV panels and angle thereof, and the mountainous backdrop ensures that the structures will not form part of the skyline. Should the buffer zones recommended for the gravel road and Windpoort Country Guest House and Cottage be adhered to the overall proposed visual intrusion on the landscape may be reduced, with the exception of the portion of the gravel road and Windpoort Country Guest House and Cottage directly adjacent to the Soyuz 4 Solar PV Park which will experience a higher visual intrusion.

Landscape Character and Quality

The Soyuz 4 Solar PV Park is located in an arid rural area forming the landscape character of dwarf shrubveld with a colour palette of mostly brown with some shades of olive green. Due to the gently sloping terrain, one can see vastly across the landscape and into the mountainous backdrop. Even though the Soyuz 4 Solar PV Park is located within a rural area, the renewable energy facility (wind and solar) at the town of De Aar, is present in the greater landscape (not visible from the Soyuz 4 Solar PV Park), thus this project will not set a precedent for renewable energy facilities in the region. The dwarf shrubveld is characteristic of this area and the greater karoo region, indicating that the landscape character is relatively common. Even though the landscape is considered homogenous in terms of vegetation and colour palette, the mountainous ranges, outcrops and hills in the landscape form topographical diversity and contributes to the scenic quality of the area, resulting in a moderately sensitive area.

Night-Time Lighting

The Soyuz 4 Solar PV Park is located in a rural area where the only sources of lighting are the town of Britstown (located approximately 6 km to the north) and the scattered farmsteads. The lighting environment of the region is therefore considered intrinsically dark (Zone E1 [Natural]). Development of the Soyuz 4 Solar PV Park may potentially be a source of light pollution during the construction and operational phases, due to security lighting on the perimeter fence and at the buildings (substation, BESS and O&M Buildings). Overall, the impact significance of potential night-time lighting is expected to be moderately low and will be limited to a local area, as the Soyuz 4 Solar PV Park is not a development that requires a significant amount of lighting. This corresponds with Bortle's Scale – indicating that Soyuz 4 Solar PV Park falls within a Class 1 area (excellent dark sky) where the light pollution is so low only the airglow is apparent, and ground objects are only visible as silhouettes, in

this case the distant farmsteads. As such the introduction of lighting sources in an intrinsically dark area results in the Soyuz 4 Solar PV Park to somewhat contribute to the effects of sky glow and artificial lighting in the region. It should however be noted that the mountain ranges and gently undulating topography will reduce the range of visibility of the proposed lighting from the Soyuz 4 Solar PV Park.

Sense of Place

Sense of place is the unique value that is allocated to a specific place or area through the cognitive experience of the user or viewer. It is created by the land use, character and quality of a landscape, as well as by the tangible and intangible value assigned thereto. The sense of place associated with the Soyuz 4 Solar PV Park is related to the landscape character type, defined as rural, relatively flat to gently sloping with little anthropogenic movement. The Soyuz 4 Solar PV Park can be described as calm, tranquil and peaceful, with limited development and movement, with the exception of the shepherds moving with the livestock. The sense of place is however not unique to the Soyuz 4 Solar PV Park as it extends to the larger region. During the construction phase of the Soyuz 4 Solar PV Park, the sense of place will however be significantly affected, shifting the mood to busy and disturbed with construction vehicles and potential need for some earth moving equipment, however, once the panels are operational there will be limited additional vehicular movement in and out of the area, thus returning the area to a calm and tranquil landscape.

7.12.2 Potential Impact Identified

Potential impacts pertaining to the Soyuz 4 Solar PV Park's activities are considered below. Once a proposed layout is received a comprehensive impact assessment will be undertaken during the next phase of the project and mitigation measures will be developed to reduce the impact significance of associated activities on the visual environment. Several potential visual impacts to the receiving environment by the proposed development activities have been identified and are presented below:

- **Development activities such as vegetation clearing, vehicular movement, rubble dumping, and associated construction will lead to changes in the landscape character and sense of place, visual exposure and visibility;**
- Excavation activities related to the development of foundations for the substations and solar panels, resulting in dust generation, leading to visual exposure and visibility;
- Construction and operation activities taking place on both sides of the road, and within close proximity to the Witfontein Trust Farm farmstead and other farmstead, leading to visual contrast, a change in the landscape character and thus a high visual intrusion on these receptors;
- Potential of sunlight reflecting off the PV arrays creating glint and glare impacts especially for farmers traveling along the gravel road and guests at the Windpoort Country Guest House and Cottage;
- Potential risk of nighttime lighting in a remote area that is intrinsically dark with limited sources of lighting, hence the Soyuz 4 Solar PV Park may potentially contribute to sky glow and light pollution in the area.

Cumulative impacts

Presence of the solar PV facilities within an area where renewable energy structures have not been introduced in the local area (within 10 km) however a wind farm is located approximately

18.9 km east and a solar facility located approximately 28,5 km to the east. Even though the Soyuz Solar PV Park Cluster 1-6 is not located within a REDz, there are eighteen applications for renewable energy facilities (wind and solar) within a 50 km radius of the Soyuz 4 Solar PV Park, of which eleven have been approved, one has lapsed or been withdrawn and seven are still in the process.

Cumulative visual impacts resulting from landscape modifications as a result of the proposed project in conjunction with the eleven approved applications within a 50 km radius, as well as any future renewable energy facilities (wind and solar facilities) must be considered. Renewable energy facilities have the potential to cause large scale visual impacts and the location of several such developments in close proximity to each other could significantly alter the sense of place and visual character in the broader region. Hence the cumulative impact of this project will be discussed in the Visual Impact Assessment Report during the next phase.

From a visual aspect, there are no fatal flaws associated with the Soyuz 4 Solar PV Park should the recommended buffer zones for the gravel road and Windpoort Country Guest House and Cottage be considered. The visual impacts associated with the Soyuz 4 Solar PV Park will be assessed in detail in the next Phase of the project and management and mitigatory measures will be presented in line with the mitigation hierarchy.

*Based on the findings of the Scoping Phase Visual report before the EAP, the appointed specialist **has not identified any fatal flaws** with the project proposal, and it is reasonable to suggest that **the proposed PVSEF is acceptable from a Visual perspective.***

8 PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ACTIVITY, SITE AND LOCATION WITHIN THE SITE

*In accordance with **Appendix 2 Regulation 2(1)(g) (i, x and v); of GN No. R. 326 of the NEMA EIA Regulations (2014 as amended)**, the following information is presented in this Section:*

***2(1)(g)** – A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including:*
***2(h) i** – Details of the alternatives considered*
***2(h) x**- If no alternatives, including alternatives location for the activity were investigated, the motivation for not considering such*
***2 (h) v** –the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts:*
***(aa)** – can be reversed*
***(bb)** – May cause irreplaceable loss of resources; and*
***(cc)** – Can be avoided, managed or mitigated*

In terms of the NEMA EIA Regulations (2014, as amended) all Basic Assessment Reports, Scoping Reports and Environmental Impact Reports must contain a description of any **feasible** and **reasonable**

alternatives that have been identified, including a description and comparative assessment of the advantages and disadvantages that the proposed activity and alternatives will have on the environment and on the community that may be affected by the activity.

Every EIA process must identify and investigate alternatives, with feasible and reasonable alternatives to be comparatively assessed.

Alternatives are defined in the NEMA EIA Regulations as "different means of meeting the general purpose and requirements of the activity".

The feasibility and reasonability of and the need for alternatives must be determined by considering, inter alia, (a) the general purpose and requirements of the activity, (b) need and desirability, (c) opportunity costs, (d) the need to avoid negative impact altogether, (e) the need to minimise unavoidable negative impacts, (f) the need to maximise benefits, and (g) the need for equitable distributional consequences.

Alternatives in the context of an activity 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 be used in the activity; and
- The operational aspects of the activity.

The "No-Go" alternative must also be assessed.

Table 17 describes alternatives that are typically referred to during an EIA process, which are strongly influenced by the development opportunities and constraints identified during the process.

Table 17 Typical Alternatives Assessed in an EIA Process

TYPE OF ALTERNATIVE	EXPLANATION / EXAMPLES
Location	Refers both to alternative properties as well as alternative sites on the same property.
Activity	Incineration of waste rather than disposal at a landfill site / Provision of public transport rather than increasing the capacity of roads.
Design or Layout	Design – Different architectural and/or engineering designs Layout – Consideration of different spatial configurations of an activity on a particular site (e.g. siting of a noisy plant away from residences)
Technological	Consideration of such alternatives is to include the option of achieving the same goal using a different method or process (e.g.1000MW of energy using a coal-fired power station or wind turbines)
Demand	Arises when a demand for a certain product or service can be met by some alternative means (e.g. the demand for electricity could be met by supplying more energy or using energy more efficiently by managing demand)

TYPE OF ALTERNATIVE	EXPLANATION / EXAMPLES
Input	Input alternatives are applicable to applications that may use different raw materials or energy sources in their process (e.g. industry may consider using coal or a natural gas as a fuel source)
Routing	Consideration of alternative routes generally applies to linear developments such as powerline servitudes, transportation and pipeline routes.
Scheduling and Timing	Where a number of measures might play a role in an overall program, but the order in which they are schedule will contribute to the overall effectiveness of the end result.
Scale and Magnitude	Activities that can be broken down into smaller units and can be undertaken on different scales.
No-Go Option	This is the option of not implementing the activity.

The NEMA Principles states that sustainable development requires the consideration of all relevant factors including the following:

- *That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
- *that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
- *that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;*
- *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;*
- *that the use and exploitation of non-renewable natural resources is responsible and*
- *equitable, and takes into account the consequences of the depletion of the resource;*
- *that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;*
- *that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and*
- *that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.*

Based on the available information the following feasible and reasonable alternatives for the Project have been identified and, in conjunction with reference to various specialist opinions have considered that the following alternatives, should be comparatively assessed, during the S&EIA Process of the Project:

1. Property Alternative
2. Activity Alternative
3. Design or Layout Alternative
4. Technology Alternatives
5. Operational Alternative
6. The “No-Go” consideration (this is a mandatory option)

In context of the information presented above, and described in detail below, there is no evidence to suggest that other alternatives should be investigated for the proposed activity.

8.1 THE "LOCATION" ALTERNATIVE

This site was selected as it was identified as particularly well suited for the proposed activity (the PVSEF), in addition to the Landowner being eager to participate in the Project. Further to this, the independent specialists that have assessed the site have not identified any fatal flaws with the site or a need to investigate alternative sites.

An Opportunities and Constraints Map (please refer to Section 8.4) was compiled to provide a clear indication of areas that are immediately deemed suitable and those areas which are considered potentially problematic for development.

Based on the above, at this stage, there is no reason to suggest that alternative locations be investigated as these would not meet the general purpose and need of the proposed activity.

Therefore, no alternative sites were investigated for the purpose of this Draft Scoping Report.

8.2 THE "ACTIVITY" ALTERNATIVE

The purpose of the activity type is particularly well suited to the proposed activity, and the activity applied for is very specific, which is to construct a PVSEF to generate renewable energy. Further to the above, the expert assessments undertaken for the site did not find any reason to suggest that an activity alternative is required to be investigated.

Based on the above, at this stage, there is no reason to suggest that any activity alternatives are investigated as these would not meet the general purpose and need of the proposed activity.

Therefore, no activity alternatives were investigated for the purpose of this Draft Scoping Report.

8.3 THE "DESIGN OR LAYOUT" ALTERNATIVE

The EAP and Professional Team undertook an Opportunities and Constraints Analyses upfront in order to determine 'developable' and 'non developable' areas within the project site. (Refer to section 9)

This approach prioritises the consideration of the environmental attributes in the project development process and integrates them in the design and layout configuration process. The technical design requirements are matched upfront with 'developable' areas identified through this rigorous process. Within this acceptable development footprint, the preferred layout is the developed.

This methodology optimises the development footprint are instead of creating several design alternatives. Therefore, no other reasonable or feasible design layouts will be put through the assessment process. The Preferred Development Footprint (Figure 48) is assessed together with the 'no-go' alternative.

Therefore, no design or layout alternatives were investigated for the purpose of this Draft Scoping Report.

8.4 CONCLUDING STATEMENT INDICATING PREFERRED ALTERNATIVE (SITE, LAYOUT, LOCATION)

*In accordance with **Appendix 1 Regulation 3(g) and (h)(xi) of GN No. R. 326 of the NEMA EIA Regulations (2014, as amended**):*

***3(g)** – A motivation for the **preferred development footprint** within the approved site.*

***3(h) xi** – A concluding statement indicating the **preferred alternative development location** within the approved site*

Based on the methodology employed in defining the preferred development footprint as depicted in Figure 10 and that no fatal flaws have been identified, this development area is deemed to be implementable by the Professional Team. The preferred development area will be assessed in detail in the EIA phase alongside the "No-Go" alternative.

9 METHODOLOGY FOR PROJECT SITE SENSITIVITY MAPS

*In accordance with **Appendix 2 Regulation 2((1)(g) (ix); of GN No. R. 326 of the NEMA EIA Regulations (2014 as amended)**, the following information is presented in this Section:*

***2(1)(g) ix** – the outcome of the site matrix*

The rapid due diligence process for producing an opportunities and constraints map from an environmental perspective is a critical step in assessing the feasibility of development projects and ensuring that environmental concerns are adequately addressed. The process steps to produce an opportunities and constraints map from an environmental perspective are described in Figure 40. This is the process followed in the development of the Soyuz 4 Solar PV Park Layout.

Define the study area	The first step is to define the study area. This may be a specific property, a project site, or a larger geographic area. The study area should be clearly defined to ensure that the analysis is focused and relevant.
Collect data	The next step is to collect data on the study area. This may include information on land use, zoning, topography, geology, hydrology, vegetation, wildlife, and other environmental factors. Data may be collected from various sources, such as public records, GIS databases, aerial photography, and site visits.
Identify opportunities and constraints	Using the collected data, the next step is to identify the opportunities and constraints related to the study area. Opportunities may include areas suitable for development or conservation, while constraints may include areas that are environmentally sensitive, such as wetlands, endangered species habitat, or steep slopes.
Categorize areas:	Once opportunities and constraints have been identified, the next step is to categorize the areas into developable, non-developable, and developable with mitigation areas. Developable areas are those that are suitable for development without significant environmental constraints. Non-developable areas are those that should be avoided due to significant environmental constraints. Developable with mitigation areas are those that may be suitable for development, but may require mitigation measures to address environmental concerns.
Produce a map	Finally, the opportunities and constraints should be mapped, and the areas categorized as developable, non-developable, and developable with mitigation should be clearly identified. The map should be presented in a clear and concise format that is easily understandable by stakeholders.

Figure 40 Rapid Due Diligence Process

9.1 DEFINE THE STUDY AREA

The selected study area for the Soyuz 4 Solar PV Park is Portion 5 of The Farm 127, Twyfelhoek. The extent of this area is shown in Figure 41.

9.2 COLLECT DATA

Based on the selected study area, information pertaining to the land use, zoning, topography, geology, hydrology, vegetation, wildlife, and other environmental factors was collected. This data was collected from various sources, such as public records, GIS databases and aerial photography.

9.3 IDENTIFY OPPORTUNITIES AND CONSTRAINTS

Regulation 16(1)(b)(v) of the Environmental Impact Assessment Regulations, 2014, as amended requires a screening report as generated by the National Web Based Environmental Screening Tool in terms of Section 24(5)(h) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) to be submitted along with the application, effective from October 2019. The screening tool can be described as an online, geographic information system, which enables the user to assess the proposed area of development for any potential sensitivities.

The report generated by the screening tool provides an indication of specialist's studies that will be mandatory to undertake during the authorisation process, based on the development plans for the region of the environmental sensitivity of the site. The screening tool and generated report assist companies and consultancies in ensuring that accurate planning and subsequent applications can be undertaken. This tool serves as a starting point for identifying the opportunities and constraints for the site.

Following on from the appointment of the Specialists to form the Professional Team for the S&EIA, further information is gathered to identify and map the site-specific opportunities and constraints for the respective environmental aspects. Opportunities may include areas suitable for development or conservation, while constraints may include areas that are environmentally sensitive, such as wetlands, endangered species habitat, or steep slopes.

9.4 CATEGORIZE AREAS

Once opportunities and constraints have been identified, the next step is to categorize the areas into developable, non-developable, and developable with mitigation areas. Developable areas are those that are suitable for development without significant environmental constraints. Non-developable areas are those that should be avoided due to significant environmental constraints. Developable with mitigation areas are those that may be suitable for development but may require mitigation measures to address environmental concerns.

For the Soyuz 4 Solar PV Park, constraints were identified for Avifauna Specialist (Figure 42), Freshwater Specialist (Figure 43), Heritage Specialist (Figure 44), Soil, Land Use and Land Capability Specialist (Figure 45), Biodiversity Specialist (Figure 46) and Visual Specialist (Figure 47).

9.5 PRODUCE A MAP

The opportunities and constraints identified by the various specialist studies were then consolidated to produce a map for the Technical Team to design the PVSEF layout. The Technical Team will be guided by the Opportunities and Constraints Map (Figure 48) to avoid non-developable areas, minimise the use of developable areas with mitigation and stay within the developable areas far as possible. The Soyuz 4 Solar PV Park development footprint in Figure 10 is aligned with the developable areas in Figure 48.

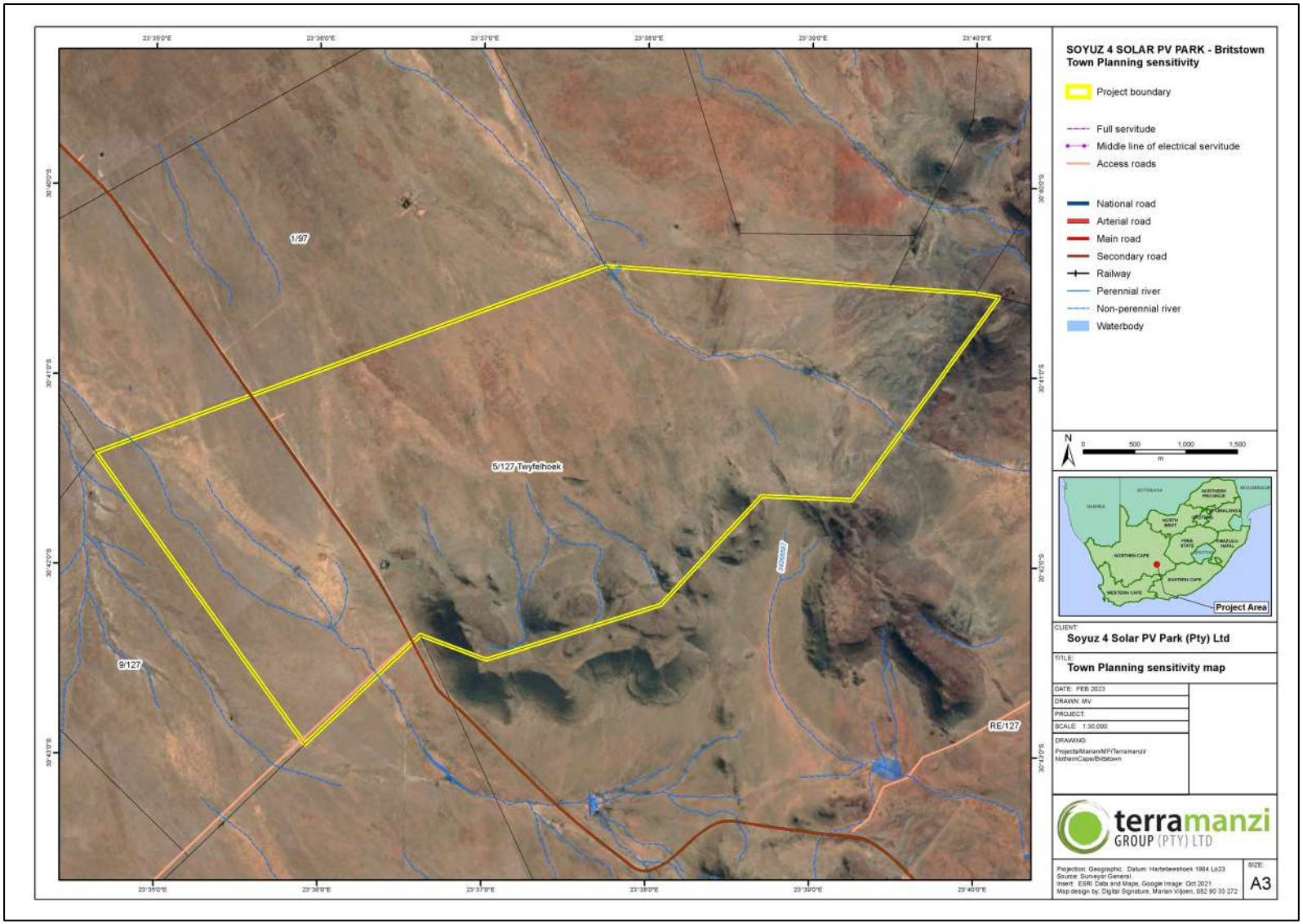


Figure 41 Study Area

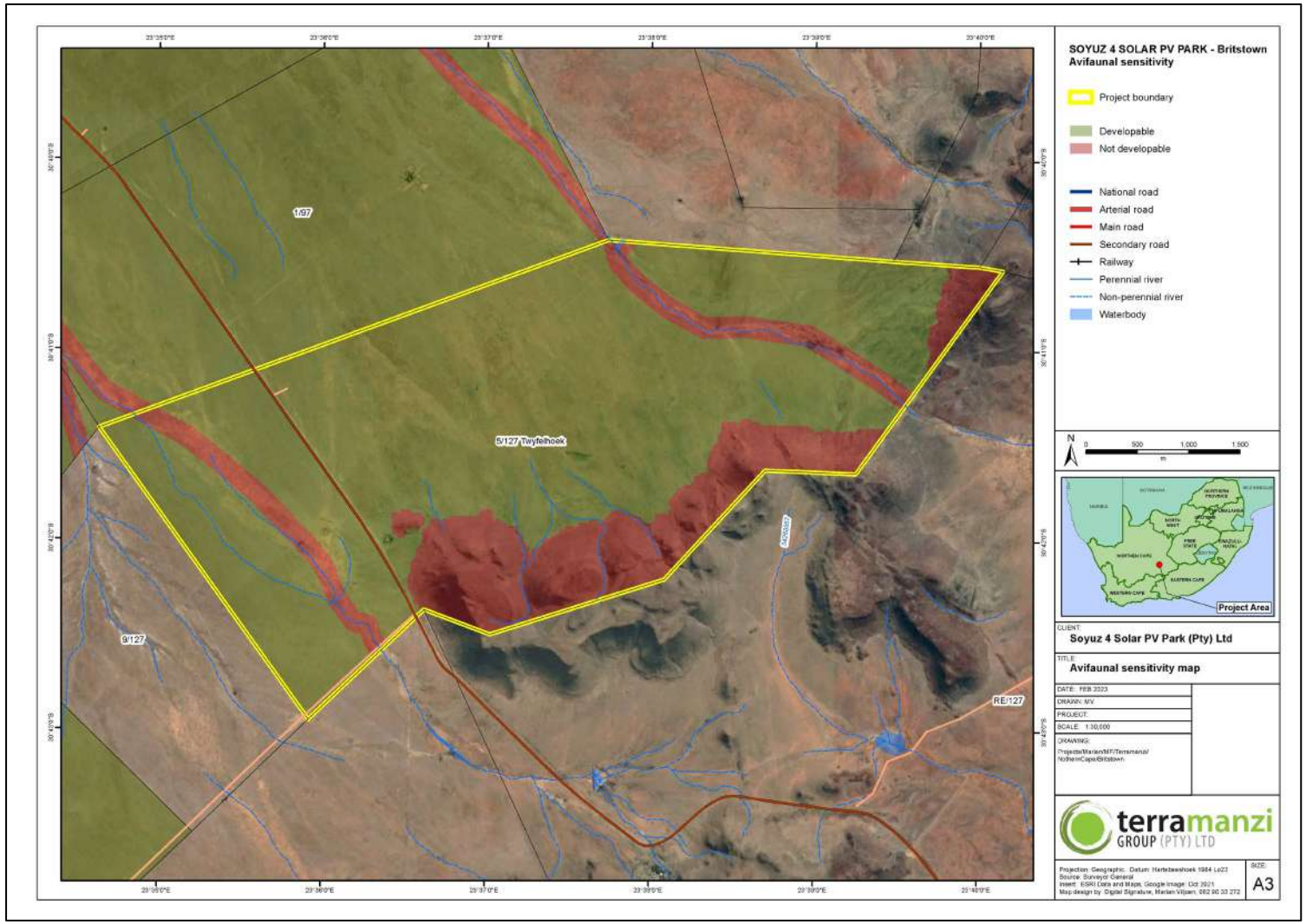


Figure 42 Avifauna Sensitivity Map

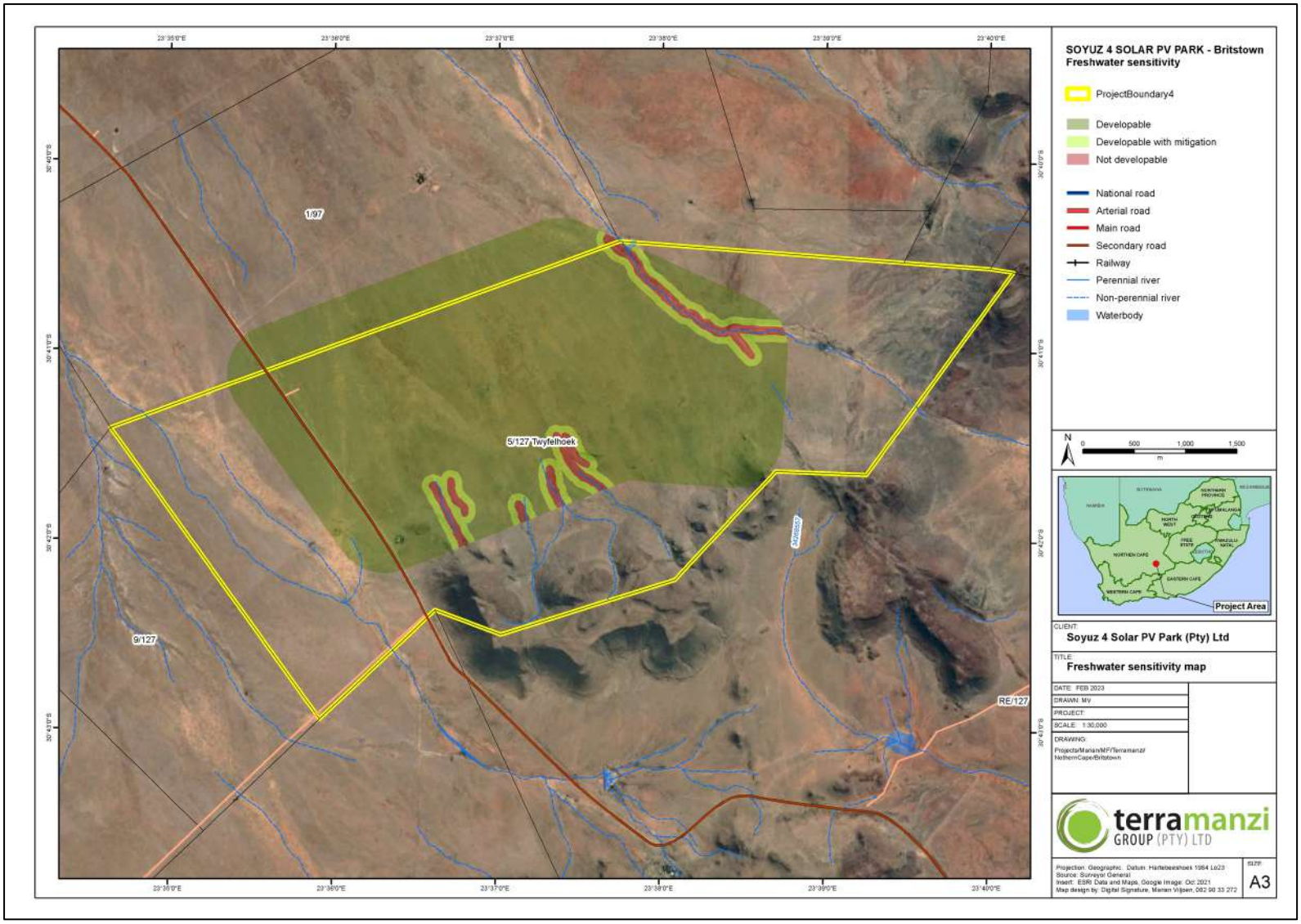


Figure 43 Freshwater Sensitivity Map

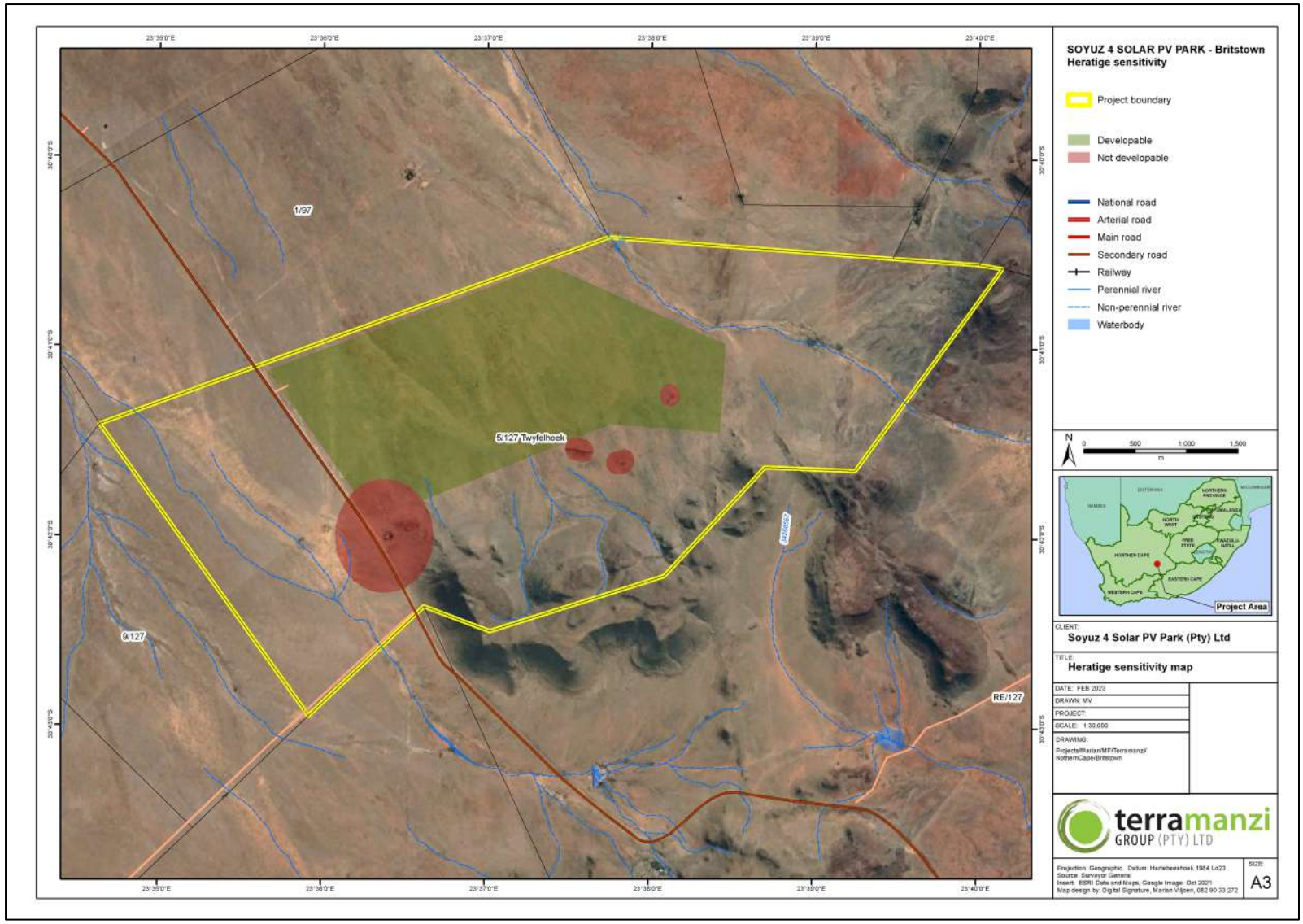


Figure 44 Heritage Sensitivity Map

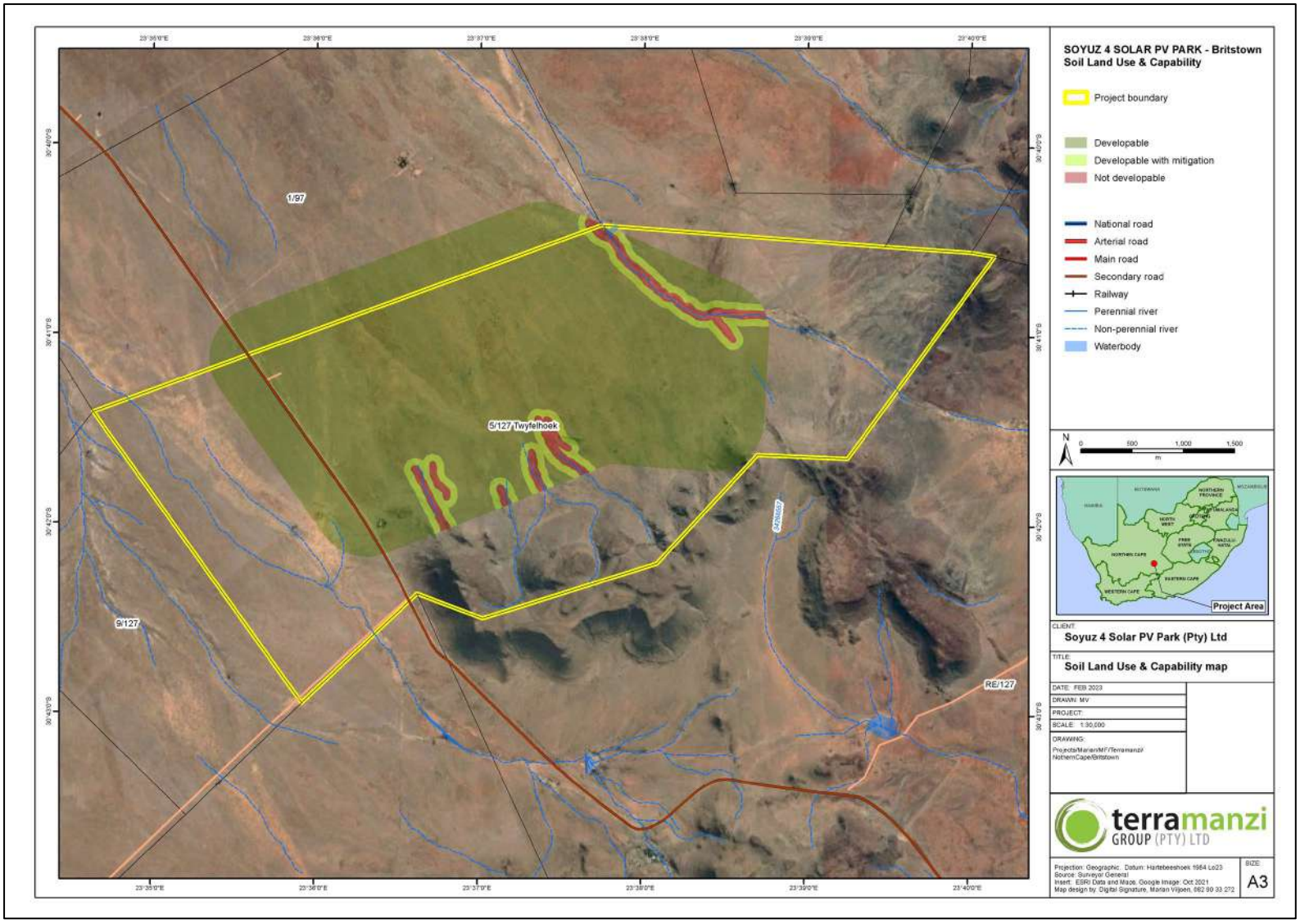


Figure 45 Soil, Land Use and Land Capability Sensitivity Map

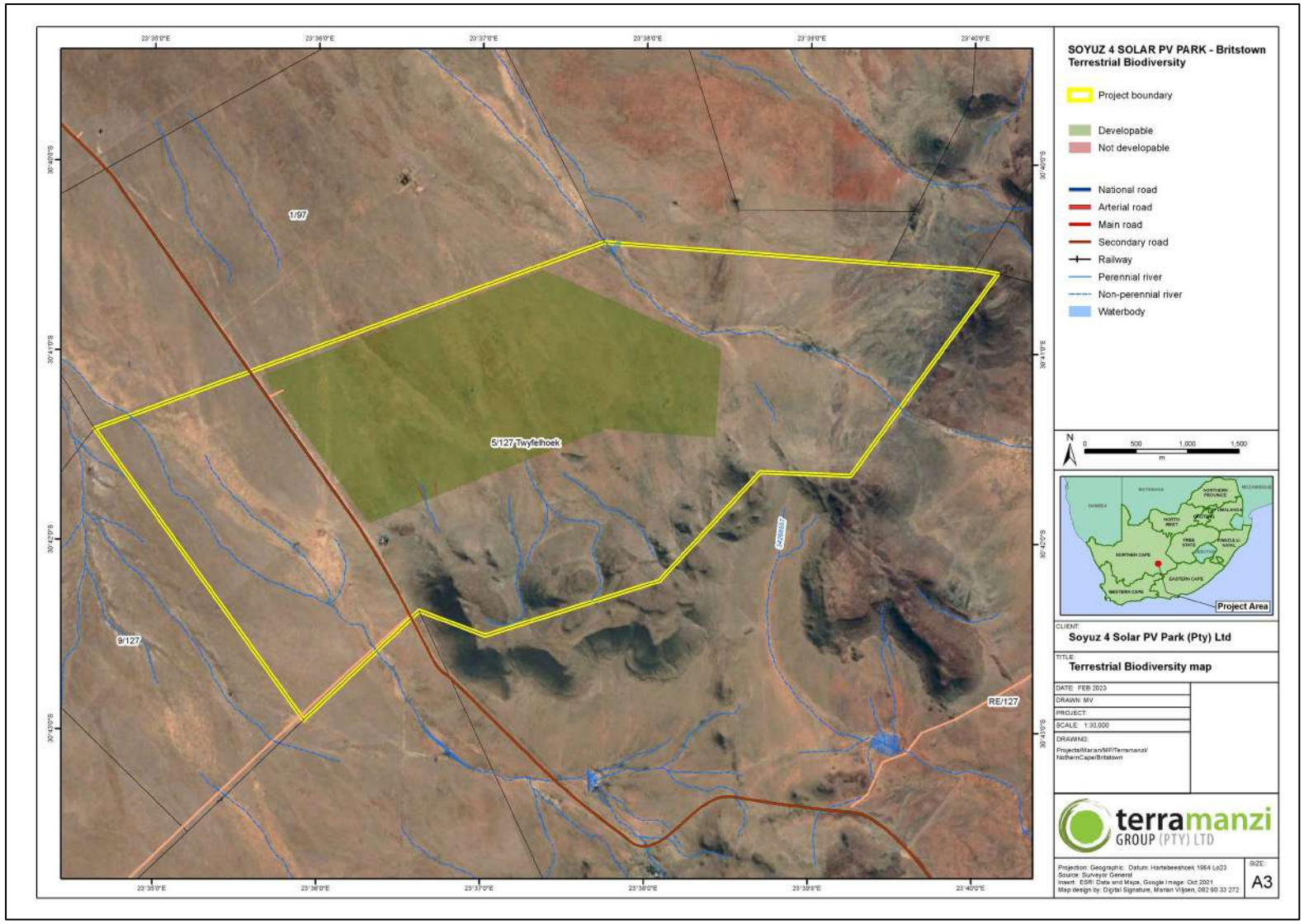


Figure 46 Biodiversity Sensitivity Map

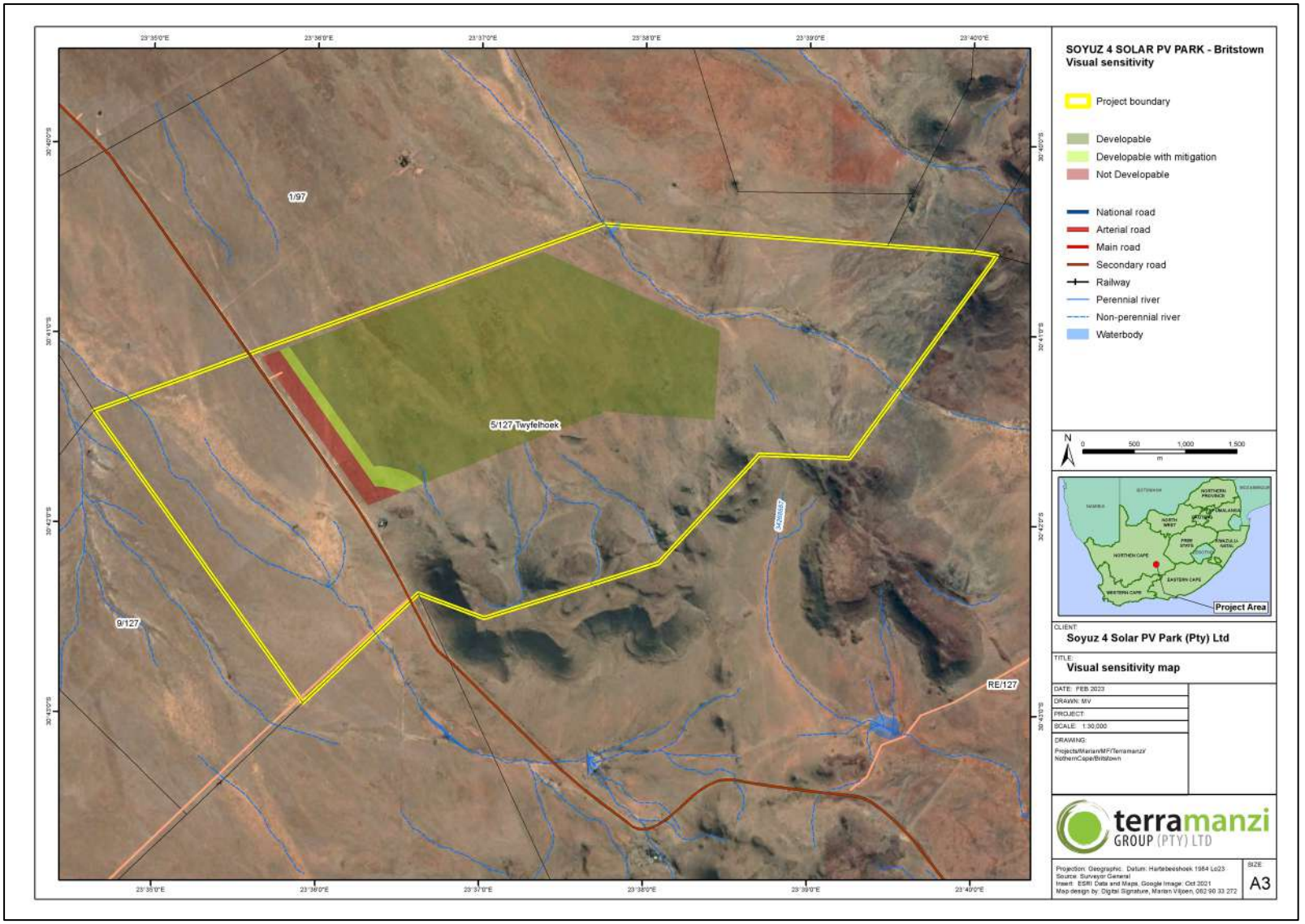


Figure 47 Visual Sensitivity Map

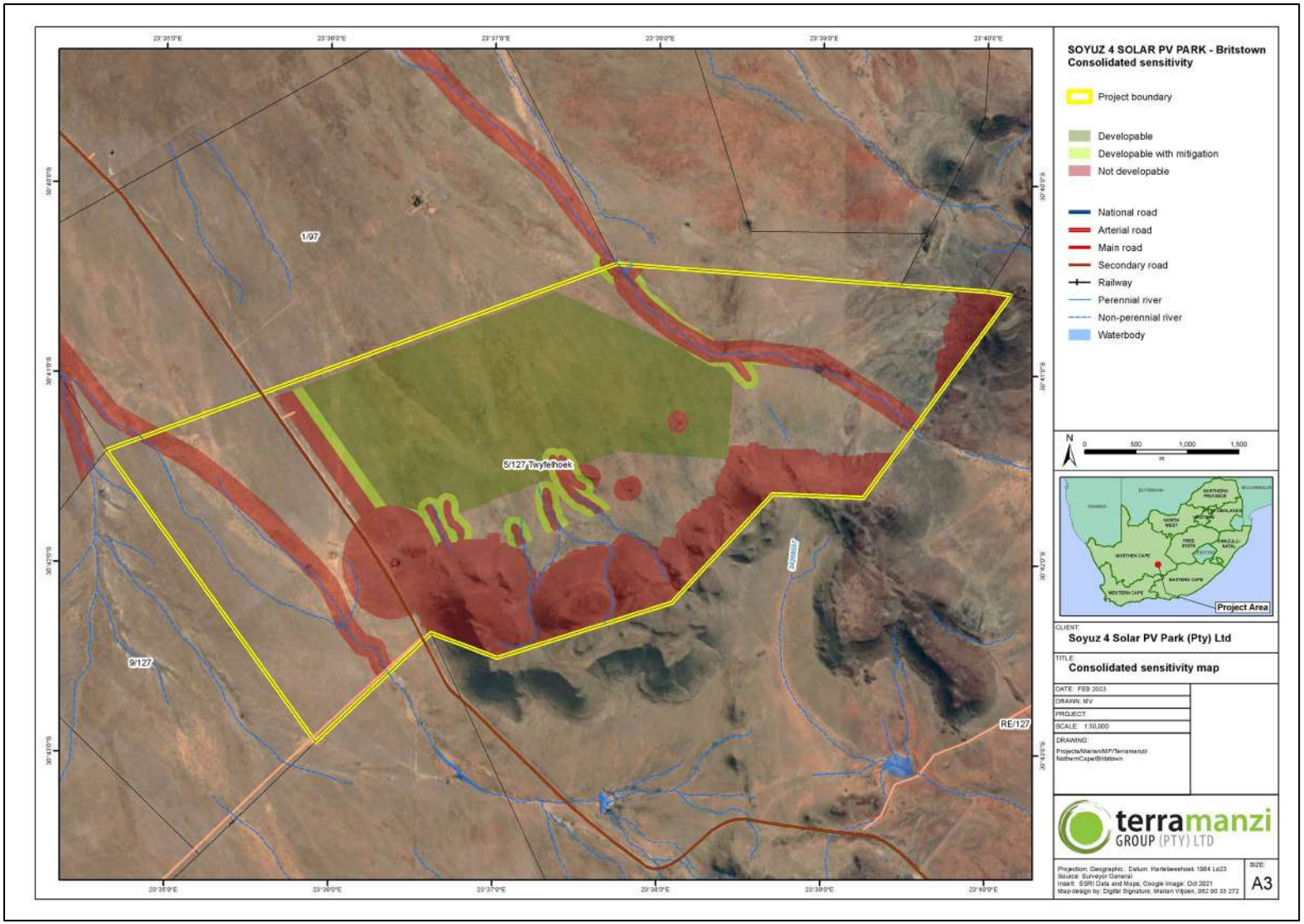


Figure 48 Consolidated Sensitivity and Site Layout Map

10 METHODOLOGY ADOPTED IN THE ASSESSMENT OF POTENTIAL IMPACTS DURING THE SCOPING PHASE

In accordance with ***Appendix 2 Regulation 2(1)(g) (vi) of GN No. R. 326 of the NEMA EIA Regulations (2014 as amended)****, the following information is presented in this Section:*

> ***2(1)(g) vi*** *– The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;*

The Scoping Phase assessment of the potential impacts has been based on extensive experience related to PVSEF facilities and the environmental impact assessment process; and augmented by specialist assessment and input. The Scoping Phase impact assessment will also be coupled with input and comment from stakeholders. The Scoping Phase impact assessment is intended to highlight potentially significant environmental impacts that may require more detailed assessment by specialists and/or to determine what additional information will be required to assess potential impacts more thoroughly during the EIA phase.

The types of potential impact (direct, indirect, and cumulative) have been considered along with the nature and magnitude (severe, moderate, and low), extent and location of the potential impacts.

Predictions have been made of the timing (construction, operation or decommissioning phase) and duration (short, long term, intermittent or continuous) of the potential impact. A prediction will also be made of the likelihood or probability of impacts occurring and an estimation of the significance of the potential impact (local, regional or global scale).

Mitigation measures have been identified that could be implemented to avoid or lessen the potential negative impacts and an evaluation of the predicted significance of residual impacts after mitigation, has been made. The assessment of the potential impacts will be conducted implementing a methodology that has been adapted from best practice guidelines disseminated from the Competent Authority (DFFE).

These impacts have been identified based on the following:

- Inspection of the site and surroundings (current environmental conditions);
- Discussions with members of the project team;
- Discussions with relevant authorities (DFFE);
- Previous investigations in the area;
- Independent specialist studies;
- Issues and concerns raised during the public participation process; and
- Determining future changes to the environment because of the proposed activity.

The descriptors used to assess the impacts are described in Table 18.

Table 18 Definitions of the Impact Assessment Methodology

ITEM	DEFINITION
EXTENT	
Local	Extending only as far as the boundaries of the activity, limited to the site and its immediate surroundings
Regional	Impact on the broader region
National	Will have an impact on a national scale or across international borders
DURATION	
Short-term	0-5 years
Medium-Term	5-15 years
Long-Term	>15 years, where the impact will cease after the operational life of the activity
Permanent	Where mitigation, either by natural process or human intervention, will not occur in such a way or in such a time span that the impact can be considered transient.
MAGNITUDE OR INTENSITY	
Low	Where the receiving natural, cultural or social function/environment is negligibly affected or where the impact is so low that remedial action is not required.
Medium	Where the affected environment is altered, but not severely and the impact can be mitigated successfully and natural, cultural or social functions and processes can continue, albeit in a modified way.
High	Where natural, cultural or social functions or processes are substantially altered to a very large degree. If a negative impact, then this could lead to unacceptable consequences for the cultural and/or social functions and/or irreplaceable loss of biodiversity to the extent that natural, cultural or social functions could temporarily or permanently cease.
PROBABILITY	
Improbable	Where the possibility of the impact materialising is very low, either because of design or historic experience
Probable	Where there is a distinct possibility that the impact will occur
Highly Probable	Where it is most likely that the impact will occur
Definite	Where the impact will undoubtedly occur, regardless of any prevention measures
SIGNIFICANCE	
Low	Where a potential impact will have a negligible effect on natural, cultural or social environments and the effect on the decision is negligible. This will not require special design considerations for the project
Medium	Where it would have, or there would be a moderate risk to natural, cultural or social environments and should influence the decision. The project will require modification or mitigation measures to be included in the design

ITEM	DEFINITION
High	Where it would have, or there would be a high risk of, a large effect on natural, cultural or social environments. These impacts should have a major influence on decision making.
Very High	Where it would have, or there would be a high risk of, an irreversible negative impact on biodiversity and irreplaceable loss of natural capital that could result in the project being environmentally unacceptable, even with mitigation. Alternatively, it could lead to a major positive effect. Impacts of this nature must be a central factor in decision making.
STATUS OF IMPACT	
Whether the impact is positive (a benefit), negative (a cost) or neutral (status quo maintained)	
DEGREE OF CONFIDENCE IN PREDICTIONS	
The degree of confidence in the predictions is based on the availability of information and specialist knowledge (e.g. low, medium or high)	
MITIGATION	
Mechanisms used to control, minimise and or eliminate negative impacts on the environment and to enhance project benefits Mitigation measures should be considered in terms of the following hierarchy: (1) avoidance, (2) minimisation, (3) restoration and (4) off-sets.	

To comparatively rank the impacts, each impact has been assigned a score using the scoring system outlined in Table 19. This scoring system allows for a comparative, accountable assessment of the indicative cumulative positive or negative impacts of each aspect assessed.

Table 19 Scoring System for Impact Assessment Ratings

IMPACT PARAMETER	SCORE
Extent (A)	**Rating**
Local	1
Regional	2
National	3
Duration (B)	**Rating**
Short term	1
Medium Term	2
Long Term	3
Permanent	4
Probability (C)	**Rating**
Improbable	1
Probable	2
Highly Probable	3
Definite	4

IMPACT PARAMETER	NEGATIVE IMPACT SCORE	POSITIVE IMPACT SCORE
Magnitude/Intensity (D)	**Rating**	**Rating**
Low	-1	1
Medium	-2	2
High	-3	3
Stakeholder Concern (E)	**Rating**	**Rating**
Low (0-5 stakeholders)	-1	1
Medium (5-10 stakeholders)	-2	2
High (10+ stakeholders)	-3	3
SIGNIFICANCE RATING (F) = (A*B*D+E)*C	**Rating**	**Rating**
Low	0 to - 40	0 to 40
Medium	- 41 to - 80	41 to 80
High	- 81 to - 120	81 to 120
Very High	> - 120	> 120

The above significance bands have been determined through calculating a maximum potential score of 156 (e.g. positive or negative) using the above methodology. This was then subdivided into broad bands as indicated above to provide a comparative assessment of all impacts in relation to the maximum possible significance score. The overall status of the impact (after mitigation) for the preferred alternative is stated in each table below.

The potential construction and decommissioning impacts have been assessed to a level of detail within this Scoping Phase that is in accordance with the requirements of Appendix II for decision making purposes for Scoping. These impacts will be further assessed and refined (where required) during the EIA Phase.

The potential impacts have been assessed in terms of the requirement to assess "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"

Only the 'Preferred Site Alternative' has been comparatively assessed against the 'No-Go Alternative' during this Scoping Phase. The preferred site alternative was determined by conducting site environmental constraints and opportunities assessment at the start of the Scoping Phase. As such, the Preferred Site Alternative is currently considered the most suitable and reasonable alternative.

11 POTENTIAL IMPACTS ASSOCIATED WITH THE ACTIVITY

In accordance with ***Appendix 1 Regulation 3(h)(vii and viii) and Regulation 3 (i) and (j)of GN No. R. 326 of the NEMA EIA Regulations (2014, as amended****):*

> ***3(h) 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*
>
> ***3(h) viii*** *– The possible mitigation measures that could be applied and level of residual risk,*

Regulation 3(i) *- A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including-*

> ***3(i) (i)*** *– A description of all environmental issues and risks that were identified during the environmental impact assessment process; and*
>
> ***3(i) (ii)*** *– An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures*

Regulation 3 (j) *– An assessment of each identified potentially significant impact and risk, including*

> ***3(j) (i)*** *– Cumulative impacts;*
>
> ***3(j) (ii)*** *– The nature, significance, and consequences of the impact and risk*
>
> ***3(j) (iii)*** *– The extent and duration of the impact and risk*
>
> ***3(j) (iv)*** *– The probability of the impact and risk occurring*
>
> ***3(j) (v)*** *– The degree to which the impact and risk can be reversed*
>
> ***3(j) (vi)*** *– The degree to which the impact and risk may cause irreplaceable loss of resources; and*
>
> ***3(j) (vii)*** *- -The degree to which the impact and risk can be mitigated*

The intention of this section is to raise awareness about **potential** impacts that are evident through the establishment and operation of the Project and associated infrastructure.

The ***potential*** *impacts listed below have been assessed based on available information and through specialist recommendations, which have provided mitigation measures to ensure that the impacts associated with the activity are mitigation to acceptable levels.*

Potential environmental impacts and issues that may be associated with the construction, operational and decommissioning phases of the proposed project (see Figure 49) and a summary of these have been identified and are listed below. The applicability and degree and extent of these impacts are anticipated to vary depending on the lifecycle stage of the development.

As part of this Environmental Permitting Process, an EMPr will be compiled for the various project life cycle stages to ensure that these impacts are minimised and/or eliminated where practicable.

Figure 49 Project Life Cycle

*The **potential** impacts listed have been anticipated based on available information and input from specialists. Please note that the descriptions below do not represent an impact assessment but the anticipated **scope** of impacts and will be further evaluated and assessed in the EIA Phase. These potential impacts are based on the proposed development with the area as depicted in Figure 10.*

The final scoring of the impacts will take place when the proposed layout is assessed as part of the EIA phase

11.1 PLANNING AND DESIGN PHASE

The physical activities of the planning and design phase do not present any potential environmental impacts. **However**, there are potential impacts that may occur during the construction and operating phase of the Solar PV Facility that can be **avoided or mitigated in the planning and design phase** by ensuring that certain layout or technology measures are implemented. These potential impacts and the proposed mitigation measures (which must be considered for implementation in the planning and design phase) are presented as follows:

11.1.1 Potential Avifaunal Impacts

Habitat Loss

Clearing of natural vegetation for the construction and establishment of the PVSEF and associated infrastructure will result in the loss, degradation and fragmentation of foraging habitat for avifauna. Loss of breeding and/or mating display habitat (lekking sites) for SCC (specifically Ludwig's Bustard) or the loss of habitat for important bird congregations may also occur. Based on the impact assessment post-mitigation, this impact has been assessed as **low negative**.

IMPACT NATURE	Direct loss of avifaunal habitat		STATUS	LOW NEGATIVE
Impact Description	Clearing of natural vegetation for the construction and establishment of the solar PV facility and associated infrastructure will result in the loss, degradation and fragmentation of foraging habitat for avifauna. While it is possible that a lekking site of Ludwig's Bustard may have been overlooked, it is highly unlikely due to the flat nature of the terrain. Ludwig's Bustards typically seek elevated areas from which to be visible from great distances. Furthermore, the Soyuz PVSEF Cluster does not support any globally, nationally, or regionally important congregations of waterfowl and / or migratory species.			
Impact Source(s)	Location and extent of development footprint.			
Receptor(s)	Ludwig's Bustard, Denham's Bustard, Kori Bustard, Karoo Korhaan and Secretary bird.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
DURATION (B)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	5	No-Go Alternative:	5
PROBABILITY (C)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-2	Preferred Alternative:	-1
	No-Go Alternative:	0	No-Go Alternative:	0
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-10**	Preferred Alternative:	**-3**
	No-Go Alternative:	**0**	No-Go Alternative:	**0**
CUMULATIVE IMPACTS	If the adjacent Soyuz WEF takes the necessary precautions to buffer the sensitive habitats for the receptor species and to prevent collisions of the receptor species with turbines and/or overhead powerlines (such as high rotor sweep heights, bird flight diverters on powerlines etc.), the receptor species should persist within the WEF cluster project boundary at ecologically viable population densities, limiting the potential for cumulative impacts to occur. The large area of the proposed Soyuz PVSEF cluster and the relatively small area within this where solar panels will be constructed is expected to provide ample remaining habitat for the receptor species to persist. Therefore, the cumulative impacts to the receptor species are unlikely to be significant.			
CONFIDENCE	High			
MITIGATION MEASURES	▪ Use the SEI spatial layers to appropriately position all surface infrastructure to avoid areas considered important for avifauna to minimise loss of Medium-High sensitivity avifaunal habitat. ▪ Ensure that the BESS and non-solar panel infrastructure occur in Low SEI portions of the project area. ▪ Prioritise existing roads for access routes as far as practicable.			

11.1.2 Potential Biodiversity Impacts

Habitat Destruction and Species Diversity

Vegetation clearing for the establishment of the PVSEF can cause habitat destruction and disturbance within the direct footprint area and the direct loss of floral and faunal communities and possibly loss of species of conservation concern (SCC).

IMPACT NATURE	Direct loss of floral and faunal communities and loss of biodiversity		STATUS	NEGATIVE
Impact Description	Vegetation clearing for the establishment of the PVSEF can cause habitat destruction and disturbance within the direct footprint area and the direct loss of floral and faunal communities and possibly loss of species of conservation concern (SCC), consequently impacting on the terrestrial biodiversity within the Soyuz 4 Solar PV Park and the immediate surrounding area.			
Impact Source(s)	Location and extent of development footprint.			
Receptor(s)	Flora and fauna and overall biodiversity			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	If the adjacent Soyuz WEF implement the recommended mitigation measures to buffer sensitive habitats and prevent biodiversity loss, the cumulative impacts to the receptor species are unlikely be low.			
CONFIDENCE	Low			
MITIGATION MEASURES	**Habitat and Species Diversity:** ▪ The design plans should take cognisance of sensitive habitats described during the EIA phase, in line with the DFFE mitigation hierarchy. As far as feasibly possible, sensitive habitats must be excluded from the proposed development activities. Development should be prioritised in habitats of decreased sensitivity. ▪ The specialist study/ies to be conducted during the EIA must clearly delineate these sensitive habitats to guide the final facility layout and the layout for the construction activities (e.g. laydown areas etc). ▪ Access roads should be kept to existing roads to reduce further fragmentation of the existing natural habitat. ▪ The construction and operational footprints must be kept as small as possible, clearly demarcated, and prioritised in habitats of low sensitivity to minimise the impact on the surrounding environment. ▪ It is recommended that should fencing be used as part of the security measures for the Soyuz 4 Solar PV Park, it allows for the free moment of small faunal species. **Species of Conservation Concern:** ▪ In terms of the mitigation hierarchy, avoidance should be undertaken primarily to avoid high impacts to floral and faunal SCC. Following this, and if not completely possible to avoid impacts, a search and rescue should be undertaken prior to the vegetation clearing activities. ▪ Prior to any vegetation clearing activities taking place, an authorised search and rescue plan must be implemented for floral and faunal SCC within the proposed footprint areas. From a faunal perspective, rescue efforts should focus on SCC that lack mobility and will therefore be unable to flee disturbance. Search and rescue efforts should focus on smaller, less mobile faunal SCC that will not be able to move away from the disturbances. Rescue efforts should also include a walkdown of the proposed footprint areas to			

	detect and/or mark all (potentially) occurring floral SCC. This should be overseen by a suitably qualified specialist to ensure that species loss during construction activities is kept to a minimum. ▪ Where faunal and floral SCC are in the proposed footprint areas, the appropriate permits must be obtained from the relevant authorities before any further work can be conducted. ▪ Should any floral species be found within the proposed development footprint, they must be legally relocated to suitable, similar habitat near to where they were removed from, but outside the disturbance footprint.

11.1.3 Potential Climate Change Impacts

This section considers the impacts of anticipated Climate Change on the proposed facility. The assessment has been based on available information and from input from the Climate Change Scoping Assessment.

Physical effects associated with an increase in intense rainfall events

The anticipated increase in intense rainfall events could result in reduced generation capacity due to longer period of cloud cover as well as damage to infrastructure due to flooding or high wind speed events.

IMPACT NATURE	Damage to infrastructure		STATUS	NEGATIVE
Impact Description	These events could affect production capacity during high cloud cover events. High rainfall events could result in flooding affecting site access, safe operation of equipment, delivery of fuel, as well as physical damage to infrastructure during high wind speed events associated with intense storms.			
Impact Source(s)	Anticipated effects of global climate change			
Receptor(s)	Construction phase employees, equipment and materials. Integrity and operational sustainability of the facility.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	None anticipated.			
CONFIDENCE	High			
MITIGATION MEASURES	Planning and design phase must consider potential damage by intense rainfall events and ensure adequate protection for infrastructure. The planning phase should also consider the impact on reduced generation capacity over time due to potential reduction in sunlight hours due to increased cloud cover associated with rainfall events.			

11.1.4 Potential Freshwater Impacts

Altered freshwater ecosystem habitat and ecological structure

Direct impacts could occur should the footprint of the Soyuz 4 Solar PV Park encroach on the delineated extent of the freshwater ecosystems that are located within the study area, thereby resulting in direct transformation or degradation of freshwater habitat.

IMPACT NATURE	Direct transformation of freshwater habitat		STATUS	NEGATIVE
Impact Description	Should solar PV arrays or other infrastructure such as local access roads be developed within the four drainage lines on the southern-most part of the study area, this will result in a direct impact on the affected reach – i.e. the direct transformation of a certain area of freshwater habitat and could result in alterations to the hydrology and geomorphology of the affected reach. Grading of the site (bulk earthworks) to allow the construction of PV arrays could completely infill and transform drainage line reaches, thus resulting in the complete loss of all hydro-ecological functionality associated with these drainage lines.			
Impact Source(s)	Construction and decommissioning of the facility			
Receptor(s)	The on- and off-site aquatic environment.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	There could be potential cumulative impacts due to the possible existence of other operations/activities in the region impacting on the same surface water resources.			
CONFIDENCE	Medium			
MITIGATION MEASURES	The mitigation measures will be further detailed in the EMPr based on the input of a more detailed aquatic assessment related to the proposed layout of the facility and associated infrastructure and the assessed sensitivities of the aquatic features associated with the development site. The construction footprint must be contained within the delineated disturbance footprint as determine during the EIA phase and confirmed in the planning and design phase.			

Altered drainage patterns

Altered drainage patterns (related to stormwater in the event of precipitation events) due to increased impermeable surfaces or surfaces cleared of vegetation could adversely affect downgradient / adjacent freshwater ecosystems through altering flow dynamics.

IMPACT NATURE	Altered surface water drainage patterns impacting negatively on the baseline aquatic environment		STATUS	NEGATIVE
Impact Description	Altered drainage patterns (related to stormwater in the event of precipitation events) due to increased impermeable surfaces or surfaces cleared of vegetation could adversely affect downgradient / adjacent freshwater ecosystems through altering flow dynamics. In turn, this may contribute to increased alien vegetation proliferation and possible incision and sedimentation of the freshwater ecosystems. These altered stream dynamics could result in loss of aquatic biodiversity.			
Impact Source(s)	Construction and decommissioning of the facility			
Receptor(s)	The on- and off-site aquatic environment.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	There could be potential cumulative impacts due to the possible existence of other operations/activities in the region impacting on the same surface water resources.			
CONFIDENCE	Medium			
MITIGATION MEASURES	The mitigation measures will be further detailed in the EMPr based on the input of a more detailed aquatic assessment related to the proposed layout of the facility and associated infrastructure and the assessed sensitivities of the aquatic features associated with the development site.			

Altered surface water velocities

It is considered likely that the development of operational stormwater infrastructure will occur as part of the proposed development and may lead to loss of catchment yield from stormwater containment, thereby leading to altered aquatic vegetation community structure and diversity due to moisture stress and reduction in volume of water entering the freshwater environment, leading to reduced recharge.

IMPACT NATURE	Deterioration in surface water quality.		STATUS	NEGATIVE
Impact Description	It is considered likely that the development of operational stormwater infrastructure will occur as part of the proposed development and may lead to loss of catchment yield from stormwater containment, thereby leading to altered aquatic vegetation community structure and diversity due to moisture stress and reduction in volume of water entering the freshwater environment, leading to reduced recharge.			
Impact Source(s)	Stormwater management during the construction and decommissioning of the facility			
Receptor(s)	The on- and off-site aquatic environment.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	

	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	There could be potential cumulative impacts due to the possible existence of other operations/activities in the region impacting on the same surface water resources.			
CONFIDENCE	Medium			
MITIGATION MEASURES	The intensity of the impact will be reduced if stormwater generated from the operational components of the development, if not used for stormwater recycling purposes, be discharged into the receiving freshwater environments in a manner that does not result in scouring and erosion of freshwater ecosystems and alterations to freshwater ecosystem hydrology. Detailed mitigation measures will be described in the EMPr based on the input of a more detailed aquatic assessment which will consider the proposed layout of the facility and associated infrastructure, the proposed operational phase stormwater management plan and the assessed sensitivities of the receiving aquatic features.			

11.1.5 Potential Noise Impact

There are several potential sources of noise generation associated with the operational phase of the PVSEF. The operational phase noise impacts have been assessed by the noise specialist.

IMPACT NATURE	**Noise generated by operations**		**STATUS**	**LOW NEGATIVE**
Impact Description	Change in ambient noise levels in the vicinity of the central inverter, BESS, sub-station, O&M building and access and site roads,			
Impact Source(s)	Ventilation fans and vehicle engines			
Receptor(s)	Nearby farmhouse and employees			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	-1	No-Go Alternative:	-1
DURATION (B)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:	-4	No-Go Alternative:	-4
PROBABILITY (C)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:	-3	No-Go Alternative:	-2
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	-2	No-Go Alternative:	-2
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**8**	Preferred Alternative:	**8**
	No-Go Alternative:	**-24**	No-Go Alternative:	**-24**

CUMULATIVE IMPACTS	The noise level change during the power generation activities is expected to be below the nuisance threshold value of 7.0dBA.
CONFIDENCE	High
MITIGATION MEASURES	This potential impact will be assessed in more detail as part of the EIA phase.

11.1.6 Potential Visual Impacts

Based on the available information and the visual impact scoping report, it is reasonable to suggest that the development of the PV Solar Facility has the potential to alter the visual landscape and the sense of place in this area through the installation of infrastructure that will rise above ground level (industrial look) and is different to any existing infrastructure in the area (agricultural look)

IMPACT NATURE	**Visual changes caused by changing the visual outlook of the landscape from agricultural to industrial**		**STATUS**	**LOW NEGATIVE**
Impact Description	Visual changes altering the sense of place.			
Impact Source(s)	Operational phase infrastructure			
Receptor(s)	Farmhouses in the vicinity of Soyuz Solar Park 4, travellers on National Road			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1
DURATION (B)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	3	No-Go Alternative:	3
PROBABILITY (C)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:	23	No-Go Alternative:	2
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-3	Preferred Alternative:	-2
	No-Go Alternative:	1	No-Go Alternative:	1
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-6**	Preferred Alternative:	**-4**
	No-Go Alternative:	**6**	No-Go Alternative:	**6**
CUMULATIVE IMPACTS	The operational phase impacts are considered direct and permanent			
CONFIDENCE	Medium			
MITIGATION MEASURES	From a visual aspect at this scoping phase level of assessment, there are no anticipated visual flaws associated with the Soyuz 4 Solar PV Park should the recommended buffer zones for the gravel road and Windpoort Country Guest House and Cottage be considered. The visual impacts of the operational phase infrastructure will be assessed in detail in the EIA phase and management and mitigatory measures will be presented in line with the mitigation hierarchy. These mitigation measures will be included into the design of the facility where applicable.			

11.2 POTENTIAL CONSTRUCTION IMPACTS

The potential social and environmental impacts associated with the construction and decommissioning phases for the 'Preferred Alternative' and 'No Go' alternative have been assessed as follows:

11.2.1 Potential Avifaunal Impacts

Each of the potential impacts is carefully described along with proposed mitigation measures to limit these impacts.

Based on the available information and the Avifaunal Scoping Assessment, the following impacts have been scoped and assessed in the Scoping Phase of this Environmental Permitting Process and will be further detailed and assessed in the EIA Phase:

Habitat Loss

The potential clearing of additional area to accommodate the construction phase camp and laydown areas could result in the additional loss, degradation and fragmentation foraging habitat for avifauna beyond the planned development footprint. Based on the impact assessment post-mitigation, this impact has been assessed as **low negative**.

IMPACT NATURE	Direct loss of avifaunal habitat		STATUS	LOW NEGATIVE
Impact Description	Clearing of natural vegetation for the construction activities beyond the planned development footprint will result in the loss, degradation and fragmentation of foraging habitat for avifauna.			
Impact Source(s)	Site clearing and preparation for construction and/or decommissioning.			
Receptor(s)	Ludwig's Bustard, Denham's Bustard, Kori Bustard, Karoo Korhaan and Secretary bird.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
DURATION (B)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	5	No-Go Alternative:	5
PROBABILITY (C)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-2	Preferred Alternative:	-1
	No-Go Alternative:	0	No-Go Alternative:	0
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-10**	Preferred Alternative:	**-3**
	No-Go Alternative:	**0**	No-Go Alternative:	**0**
CUMULATIVE IMPACTS	If the adjacent Soyuz WEF takes the necessary precautions to prevent construction phase activities from encroaching into the buffer zones for the sensitive habitats for the receptor species, the receptor species should persist within the WEF cluster project boundary at ecologically viable population densities, limiting the potential for cumulative impacts to occur. The large area of the proposed Soyuz PVSEF cluster and the relatively small area. Therefore, the cumulative impacts to the receptor species during the construction phase are unlikely to be significant.			
CONFIDENCE	High			

MITIGATION MEASURES	▪ Confine construction activities to within the approved development footprint. ▪ Limit the areas cleared for construction purposes (e.g. laydown areas). ▪ Demarcate avifauna sensitive areas on the ground during construction and sign post them as "Environmentally sensitive areas - keep out!." ▪ Rehabilitate all areas disturbed immediately after construction. ▪ Develop and implement an Alien and Invasive Plant Control Plan.

Collision and Electrocution

Mortality from collision and electrocution is a potential impact to avifauna from solar PV farms. This risk is likely to be highest in situations where PV panels and electrical transmission infrastructure are placed closer to areas of higher habitat complexity and resource availability where bird abundances are higher (e.g. wetlands/rivers and rocky ridges). Based on the impact assessment post-mitigation, this impact has been assessed as **low negative**.

IMPACT NATURE	**Direct mortality through collision and electrocution**		**STATUS**	**LOW NEGATIVE**
Impact Description	Mortality from collision and electrocution is a potential impact to avifauna from solar PV farms. This risk is likely to be highest in situations where PV panels and electrical transmission infrastructure are placed closer to areas of higher habitat complexity and resource availability where bird abundances are higher (e.g. wetlands/rivers and rocky ridges). In addition, vehicle induced collisions (direct collisions with vehicles or vehicles induced flushes into fence infrastructure) can pose significant direct mortality risk, especially to large ground dwelling species. Several SCC are likely/known to occur in the region of the proposed development which have a wingspan large enough (>1.5 m) to bridge gaps between live and earthed components or between phases of powerlines. In addition, electrocution of birds within the substations/switching areas is also possible.			
Impact Source(s)	PVSEF and electrical transmission infrastructure			
Receptor(s)	All birds but particularly water birds, raptors and other large-bodied species with low power to weight ratios and in-flight manoeuvrability. Major receptors include the bustard species known to be present within the region.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	Without appropriate mitigation, the cumulative impacts on the receptors most at risk (bustards) from collisions with powerlines will be marked. Even with typical			

	mitigation such as bird flight diverters, collisions are avoidable and there is likely to be an appreciable cumulative impact on bustard species in the region.
CONFIDENCE	Low (without layout depicting grid connection routes and infrastructure)
MITIGATION MEASURES	▪ Install Eskom-approved bird flight diverters (flappers or coils) on new transmission lines (particularly the earth wire). This can help to increase the visibility of transmission lines especially the thinner earth line with which most collisions tend to be associated. If the transmission lines are long or if budget is constrained, then prioritise portions of the transmission lines that pass near to or cross wetlands/riverine habitats or through Medium SEI habitat. ▪ Design of overhead electrical lines must consider the potential for electrocution by large species and pre-emptively avoid the likelihood of this by increasing distances between spans to avoid faecal "streamers" or large open wings creating a short. ▪ All power cables within the project area should be fully insulated and preferably buried in demarcated corridors. ▪ White strips or simply the exposed (lustrous) aluminium frames along the edges of the solar panels appear to help to increase visibility and deter birds and are recommended as far as practically feasible. ▪ Installation of bird deterrent devices on and around boundary fences, will be required to limit collision risk. ▪ In all areas where service roads intersect with semi natural or natural habitat, all fences must be set back at least (strictly) 75 metres from the edge of every service road to allow for vulnerable species such as bustards, storks, cranes and korhaans to obtain adequate height after being flushed by vehicle traffic. Alternatively, the fences must be placed completely adjacent to the roads with a maximum of 3 metres buffer and marked with fence flappers to reduce flush related collisions.

Disturbance and Displacement

Potential impact of the disturbance of birds and displacement effects on birds (and specifically SCC), during the construction of the proposed PVSEF due to sensory effects such as dust, noise and anthropogenic activity. These effects may cause birds to relocate to alternative territories. The Avifaunal Specialist has advised that the sensory disturbance of avifauna during the construction phase is likely to occur. Based on the available information it is reasonable to suggest that this impact has a **low negative** impact.

IMPACT NATURE	**Sensory disturbance**		**STATUS**	**LOW NEGATIVE**
Impact Description	Sensory disturbances to avifauna are inevitable but are unlikely to negatively impact upon nesting SCC. Although dust, noise and human activity during construction is unavoidable, much can be done to reduce the effect of these sensory disturbance impacts on avifauna.			
Impact Source(s)	Machinery, influx of people, noise, dust, light.			
Receptor(s)	All avifauna, particularly large terrestrial birds and raptors			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	

PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	Disturbances to birds from the construction of renewable energy facilities in the region is likely to be short lived and very occasional and therefore unlikely to represent a significant cumulative impact.			
CONFIDENCE	High			
MITIGATION MEASURES	▪ Adopt temporal avoidance strategies. ▪ Minimise light pollution and fit external lighting with downward facing hoods. ▪ Demarcate natural areas beyond the surface infrastructure footprint and restrict access of personnel into these areas through education and signposting. ▪ Train staff and contractors on the importance of birds and other biodiversity and the sensitive areas for these species which should be avoided. ▪ Introduce and enforce a speed limit (40 km/h)			

11.2.2 Potential Biodiversity Impacts

Based on the available information and input from the Biodiversity Scoping Assessment, the following impacts have been scoped and assessed:

Habitat Destruction and Species Diversity

Vegetation clearing and construction activities can cause habitat destruction and disturbance within the direct footprint area and the direct loss of floral and faunal communities and possibly loss of species of conservation concern (SCC).

IMPACT NATURE	**Direct loss of floral and faunal communities and loss of biodiversity**		**STATUS**	**NEGATIVE**
Impact Description	Vegetation clearing and construction activities can cause habitat destruction and disturbance within the direct footprint area and the direct loss of floral and faunal communities and possibly loss of species of conservation concern (SCC), consequently impacting on the terrestrial biodiversity within the Soyuz 4 Solar PV Park and the immediate surrounding area.			
Impact Source(s)	Site clearing and preparation. Ongoing construction activities.			
Receptor(s)	Flora and fauna and overall biodiversity			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
	Preferred Alternative:		Preferred Alternative:	

SIGNIFICANCE RATING (F) = (A*B*D)*C	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	If the adjacent Soyuz WEF implement the recommended mitigation measures to buffer sensitive habitats and prevent biodiversity loss, the cumulative impacts to the receptor species are unlikely be low.			
CONFIDENCE	Low			
MITIGATION MEASURES	**Habitat and Species Diversity:** ▪ The construction camp, laydown areas, parking areas and construction activities may only take place within the approved footprint determined during the EIA and design phase to avoid impacts to the identified sensitive environments. ▪ No new access routes may be created during the construction phase outside of those routes identified in the EIA and planning phase. ▪ Even within in the approved development area, the footprints must be kept as small as possible, clearly demarcated, and prioritised in habitats of low sensitivity in order to minimise the impact on the surrounding environment. ▪ It is recommended that low open vegetation is kept during the construction phase to ensure habitat remains available for faunal species and to avoid habitat fragmentation. ▪ Where site clearing is necessary, it should take place in a phased manner to allow for faunal species to move out of the construction footprint area. ▪ Fires by construction personnel should be prohibited, and no uncontrolled fires whatsoever should be allowed; ▪ It is recommended that should fencing be used as part of the security measures for the Soyuz 4 Solar PV Park, it allows for the free moment of small faunal species. ▪ No harvesting of any floral or faunal species may take place; ▪ Smaller species of invertebrates and herpetofauna are likely to be less mobile, as such should any be observed in the footprint areas during clearing and construction activities, they are to be carefully and safely moved to an area of similar habitat outside of the disturbance footprint. Construction personnel must be made aware of these species and the need for their protection. Harmless reptiles should be carefully relocated by a suitably nominated construction person. For larger venomous snakes, a suitably trained person should be contacted to affect the relocation of the species, should it not move off on its own. **Species of Conservation Concern:** ▪ In terms of the mitigation hierarchy, avoidance should be undertaken primarily to avoid high impacts to floral and faunal SCC. Following this, and if not completely possible to avoid impacts, a search and rescue should be undertaken prior to the vegetation clearing activities. ▪ Prior to any vegetation clearing activities taking place, an authorised search and rescue plan must be implemented for floral and faunal SCC within the proposed footprint areas. From a faunal perspective, rescue efforts should focus on SCC that lack mobility and will therefore be unable to flee disturbance. Search and rescue efforts should focus on smaller, less mobile faunal SCC that will not be able to move away from the disturbances. Rescue efforts should also include a walkdown of the proposed footprint areas to detect and/or mark all (potentially) occurring floral SCC. This should be overseen by a suitably qualified specialist to ensure that species loss during construction activities is kept to a minimum; ▪ Where faunal and floral SCC are located in the proposed footprint areas, the appropriate permits must be obtained from the relevant authorities before any further work can be conducted;			

	▪ Should any floral species be found within the proposed development footprint, they must be legally relocated to suitable, similar habitat near to where they were removed from, but outside the disturbance footprint.

Potential Fire Management Impacts

Based on the available information, it is reasonable to predict that fire impacts are likely to be prevalent during the construction phase. Uncontrolled fires can cause significant damage to ecosystems and cause biodiversity loss:

IMPACT NATURE	Direct loss of biodiversity and habitat damage due to uncontrolled fires		STATUS	NEGATIVE
Impact Description	Potential indiscriminate fires by construction personnel may lead to uncontrolled / run-away fires, impacting on floral and faunal communities of the Soyuz 4 Solar PV Park and surrounds;			
Impact Source(s)	Construction and decommissioning activities and anthropogenic behaviour			
Receptor(s)	Immediate site and surrounds and biodiversity.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	If the adjacent Soyuz WEF implement the recommended fire management measures, the cumulative impacts of fire damaged will be avoided.			
CONFIDENCE	High			
MITIGATION MEASURES	▪ Fires by construction personnel should be prohibited, and no uncontrolled fires whatsoever should be allowed; ▪ A fire protection plan for the drier months when runaway fires are a risk must be developed for the construction phase and implemented.			

Exotic/Alien Vegetation Encroachment

Introduction of foreign material (e.g., soil) during construction activities may lead to the further introduction of alien invader species.

IMPACT NATURE	Direct loss of biodiversity due to encroachment by exotic invasive aliens.	STATUS	NEGATIVE
Impact Description	Introduction of foreign material (e.g., soil) during construction activities may lead to the introduction of alien invader species, which will impacting negatively on the indigenous floral characteristics of the Soyuz 4 Solar PV Park and immediate surrounding areas. Failure to implement an alien vegetation control plan may result in widespread degradation or loss of indigenous flora and fauna within the Soyuz 4 Solar PV Park and possibly in surrounding areas;		

Impact Source(s)	Construction and decommissioning activities and anthropogenic behaviour			
Receptor(s)	Immediate site and surrounds and biodiversity.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	If the adjacent Soyuz WEF implement the recommended alien/exotic vegetation management plan the cumulative impacts of alien vegetation encroachment on indigenous biodiversity will be avoided.			
CONFIDENCE	High			
MITIGATION MEASURES	Develop and implement an Alien and Invasive Plant Control Plan.			

Surface Scarring and Edge Effect

Permanent surface scarring due to inadequate rehabilitation and dust management may reduce favourable habitat for floral and faunal species causing a reduction in biodiversity and contribute to the edge effects on sensitive habitats.

IMPACT NATURE	**Indirect loss of biodiversity**		**STATUS**	**NEGATIVE**
Impact Description	Permanent surface scarring may reduce favourable habitat for floral and faunal species and a reduction in biodiversity. Potential for poor rehabilitation and monitoring of sensitive habitat can cause 'edge effects' thereby leading to declines in species diversity. Dust generated by ineffective, or lack of, rehabilitation of exposed areas may impact on the floral characteristics of the property and sensitive habitats			
Impact Source(s)	Construction and decommissioning activities			
Receptor(s)	Immediate site and surrounds and biodiversity.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	

CUMULATIVE IMPACTS	If the adjacent Soyuz WEF implement the recommended alien/exotic vegetation management plan the cumulative impacts of alien vegetation encroachment on indigenous biodiversity will be avoided.
CONFIDENCE	High
MITIGATION MEASURES	▪ All soils compacted outside that of the footprint area by construction activities should be ripped and reprofiled to natural levels and revegetated with indigenous vegetation. Special attention should be paid to alien and invasive plant control within these areas; and ▪ Edge effects of all construction activities, such as erosion and alien plant species proliferation, which may affect adjacent natural vegetation, need to be strictly managed adjacent to the project footprint areas.

Illegal Harvesting and Hunting

Increased anthropogenic activity in the area could bring about increased risk of harvesting of SCC and/or hunting/trapping of local indigenous faunal species. This in turn will present a risk of loss of biodiversity.

IMPACT NATURE	**Direct loss of avifaunal habitat**		**STATUS**	**NEGATIVE**
Impact Description	Increased personnel on site may result in an increased risk of harvesting/overutilisation of SCC and hunting/trapping of local faunal species. Moreover, increased personnel within the Soyuz 4 Solar PV Park inherently brings an increased risk of harvesting activities, threatening the current faunal and indigenous floral populations;			
Impact Source(s)	Construction and decommissioning activities and anthropogenic behaviour			
Receptor(s)	Immediate site and surrounds and biodiversity.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	If the adjacent Soyuz WEF implement the recommended controls the cumulative impacts of biodiversity loss as a result of illegal harvesting and/or hunting will be avoided.			
CONFIDENCE	High			
MITIGATION MEASURES	▪ No harvesting of any floral or faunal species may take place; ▪ No hunting or trapping will be permitted ▪ Disciplinary action must be taken against offenders.			

11.2.3 Potential Climate Change Impacts

This section considers the impacts of anticipated Climate Change on the proposed facility. The assessment has been based on available information and from input from the Climate Change Scoping Assessment.

Physical effects of an Increase in ambient temperatures

The anticipated increase in temperatures and increased number of very hot days in the region because of climate change (2030 – 250) will result in an increase likelihood of heat discomfort and possible possibility of heat related illness (such as heat exhaustion, heat cramps, and heat stroke).

IMPACT NATURE	Increases in ambient temperatures, specifically heat waves		STATUS	NEGATIVE
Impact Description	The anticipated increase in temperatures and increased number of very hot days in the region because of climate change (2030 – 250) will result in an increase likelihood of heat discomfort and possible possibility of heat related illness (such as heat exhaustion, heat cramps, and heat stroke). These health impacts have the potential to negatively affect personnel process performance and productivity.			
Impact Source(s)	Anticipated effects of global climate change			
Receptor(s)	Employees of the facility			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	Varies depending on the baseline health and sensitivities of each individual employee.			
CONFIDENCE	Medium			
MITIGATION MEASURES	▪ A construction phase ambient heat management and response plan should be developed for implementation during the construction phase			

Physical effects associated with an increase in intense rainfall events

The anticipated increase in intense rainfall events could result in damage to construction infrastructure and equipment due to flooding or high wind speed events.

IMPACT NATURE	Damage to infrastructure	STATUS	NEGATIVE
Impact Description	These events could affect production capacity during high cloud cover events. High rainfall events could result in flooding affecting site access, safe operation of equipment, delivery of fuel, as well as physical damage to infrastructure during high wind speed events associated with intense storms.		
Impact Source(s)	Anticipated effects of global climate change		

Receptor(s)	Construction phase employees, equipment and materials. Integrity and operational sustainability of the facility.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	None anticipated.			
CONFIDENCE	High			
MITIGATION MEASURES	Planning and design phase must consider potential damage by intense rainfall events and ensure adequate protection for infrastructure during the construction phase – Construction phase stormwater management plan. An weather management plan should be designed and implemented for the construction phase to ensure that an appropriate response is in place to protect employees, equipment, materials and the construction site from damage caused by flooding or intense rainfall and wind events.			

11.2.4 Potential Freshwater Impacts

Altered freshwater ecosystem habitat and ecological structure

Direct impacts could occur should the construction footprint of the Soyuz 4 Solar PV Park encroach on the delineated extent of the freshwater ecosystems that are located within the study area, thereby resulting in direct transformation or degradation of freshwater habitat.

IMPACT NATURE	**Direct transformation of freshwater habitat**		**STATUS**	**NEGATIVE**
Impact Description	Should the footprint area of the construction phase activities not be confined within the development footprint, then the construction phase could cause direct the direct transformation of a certain area of freshwater habitat and could result in alterations to the hydrology and geomorphology of the affected reach. Grading of the site (bulk earthworks) to allow the construction of PV arrays could completely infill and transform drainage line reaches, thus resulting in the complete loss of all hydro-ecological functionality associated with these drainage lines.			
Impact Source(s)	Construction and decommissioning of the facility			
Receptor(s)	The on- and off-site aquatic environment.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	

INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	There could be potential cumulative impacts due to the possible existence of other operations/activities in the region impacting on the same surface water resources.			
CONFIDENCE	Medium			
MITIGATION MEASURES	The mitigation measures will be further detailed in the EMPr based on the input of a more detailed aquatic assessment related to the proposed layout of the facility and associated infrastructure and the assessed sensitivities of the aquatic features associated with the development site. The construction footprint must be contained within the delineated disturbance footprint as determine during the EIA phase and confirmed in the planning and design phase.			

Altered drainage patterns

Altered drainage patterns (related to stormwater in the event of precipitation events) due to increased impermeable surfaces or surfaces cleared of vegetation during the construction phase could adversely affect downgradient / adjacent freshwater ecosystems through altering flow dynamics.

IMPACT NATURE	**Altered surface water drainage patterns impacting negatively on the baseline aquatic environment**		**STATUS**	**NEGATIVE**
Impact Description	Altered drainage patterns (related to stormwater in the event of precipitation events) due to increased impermeable surfaces or surfaces cleared of vegetation could adversely affect downgradient / adjacent freshwater ecosystems through altering flow dynamics. In turn, this may contribute to increased alien vegetation proliferation and possible incision and sedimentation of the freshwater ecosystems. These altered stream dynamics could result in loss of aquatic biodiversity.			
Impact Source(s)	Construction and decommissioning of the facility			
Receptor(s)	The on- and off-site aquatic environment.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	There could be potential cumulative impacts due to the possible existence of other operations/activities in the region impacting on the same surface water resources.			
CONFIDENCE	Medium			
MITIGATION MEASURES	The mitigation measures will be further detailed in the EMPr based on the input of a more detailed aquatic assessment related to the proposed layout of the facility and associated infrastructure and the construction activities anticipated and the			

	construction phase footprint required. A construction phase stormwater management plan will be developed and implemented.

Altered surface water quality

The use of various materials during the construction phase, as well as exposed soil due to vegetation clearing could result in a negative impact on the surface water quality associated with the development area.

IMPACT NATURE	Deterioration in surface water quality.		STATUS	NEGATIVE
Impact Description	Cement mixing (batching) during construction could adversely affect downgradient freshwater ecosystems if polluted stormwater from the batching / mixing areas is transported into freshwater ecosystems. Such polluted stormwater could alter the pH of surface water, thereby posing a risk to freshwater biota.			
Impact Source(s)	Construction and decommissioning of the facility			
Receptor(s)	The on- and off-site aquatic environment.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	There could be potential cumulative impacts due to the possible existence of other operations/activities in the region impacting on the same surface water resources.			
CONFIDENCE	Medium			
MITIGATION MEASURES	The mitigation measures will be further detailed in the EMPr based on the input of a more detailed aquatic assessment related to the proposed layout of the facility and associated infrastructure and the assessed sensitivities of the aquatic features associated with the development site.			

11.2.5 Potential Geotechnical Impacts

The primary concern associated with geotechnical works is increased soil erosion on site, due to the stripping of vegetation during the construction phase of the project. Removal of vegetation reduces infiltration, thereby increasing runoff yielding increased erosion. Further, compaction during earthworks reduces rainwater infiltration and increases surface runoff and increasing erosion. The construction of paved and/or hard-surfaced areas increases runoff and often localises discharge of stormwater, which may lead to increased erosion and consequently loss of topsoil. Disturbance of the soil may extend beyond the footprint of the structures should such conditions persist for long periods, e.g., more than 10 years.

IMPACT NATURE	Soil erosion, soil contamination and soil destabilisation		STATUS	LOW NEGATIVE
Impact Description	The primary concern associated with geotechnical works is increased soil erosion on site, due to the stripping of vegetation during the construction phase of the project. Removal of vegetation reduces infiltration, thereby increasing runoff yielding increased erosion. Further, compaction during earthworks reduces rainwater infiltration and increases surface runoff and increasing erosion. The construction of paved and/or hard-surfaced areas increases runoff and often localises discharge of stormwater, which may lead to increased erosion and consequently loss of topsoil. Disturbance of the soil may extend beyond the footprint of the structures should such conditions persist for long periods, e.g., more than 10 years.			
Impact Source(s)	Stripping of vegetation during construction Machinery and earth-moving plant causing spills contaminating soils and soil compaction			
Receptor(s)	Soil, biota, and vegetation			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-1	Preferred Alternative:	1
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-2**	Preferred Alternative:	**1**
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	Low			
CONFIDENCE	Medium			
MITIGATION MEASURES	▪ Do not prolong the construction period; and rehabilitate any disturbed areas following completion of the construction period, whether complete or on hold. ▪ Only designated laydown areas and access roads, within appropriate locations, should be used. ▪ Where required, during construction, temporary drainage channels should divert surface runoff to appropriate areas. ▪ Appropriately design drainage for infrastructure and roads. ▪ Implement erosion control measures, where appropriate, e.g. erosion control mats. ▪ Vehicles should be well maintained, parked over drip trays/hard-surfaced areas, and parked within designated areas. ▪ Decommissioning phase - Land rehabilitation to near natural state, i.e. removal of foundations and filling of any resultant voids within the soil, as well as removal of hard surfaced areas. Replacement soil should be sourced locally to ensure homogeneity.			

11.2.6 Potential Heritage Impacts

Palaeontology Impacts

Activities associated with the construction and decommissioning of the Project may disturb or destroy fossil material within the Tierberg formation sediments and the more recent Quaternary sediment that together cover the site. However, the potential for fossils in these sediments is very variable and significance of impacts palaeontological resources would thus be **low negative**, but **very low negative** with the implementation of mitigation measures.

IMPACT NATURE	Disturbance and/or destruction of paleontological material during construction and decommissioning		STATUS	LOW NEGATIVE
Impact Description	Direct disturbance and/or destruction of paleontological material as a result of excavation and clearing activities.			
Impact Source(s)	Activities associated with the construction and decommissioning of the SPV facility			
Receptor(s)	Potential palaeontological material within the development footprint			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
DURATION (B)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:	0	No-Go Alternative:	0
PROBABILITY (C)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:	0	No-Go Alternative:	0
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-2	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	-16	Preferred Alternative:	8
	No-Go Alternative:	-0	No-Go Alternative:	+0
CUMULATIVE IMPACTS	Cumulative impacts to palaeontological resources are difficult to assess due to the variable distribution and preservation of fossil material. However, location of this project and others approved or built within a 30km radius on areas either largely underlain by principally dolerite and/or Quaternary sediments suggests that the cumulative impact on palaeontological resources is likely to be low.			
CONFIDENCE	High			
MITIGATION MEASURES	Implementation of a Fossil Chance Find Protocol and monitoring of earthworks by the Environmental Compliance Officer. Report any chance finds of palaeontological material to SAHRA and/or a palaeontologist.			

Archaeology

Archaeological sites and/or materials may be affected during activities associated with the construction and decommissioning of the Project. Most of the archaeological material identified within the project footprint is of very low cultural significance, but the small lithic scatter at JG005 and the rock gong at G005 has been graded 3C and 3A. The significance of impacts on the known

archaeological would thus be low negative, but very low negative with the implementation of mitigation measures.

IMPACT NATURE	Disturbance and/or destruction of archaeological sites and/or materials during construction and decommissioning		STATUS	LOW NEGATIVE
Impact Description	Disturbance and/or destruction of archaeological sites and/or materials			
Impact Source(s)	Activities associated with the construction and decommissioning of the SPV facility			
Receptor(s)	Known and potential archaeological sites and/or materials			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
DURATION (B)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:	0	No-Go Alternative:	0
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	2
	No-Go Alternative:	0	No-Go Alternative:	0
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-2	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	-24	Preferred Alternative:	8
	No-Go Alternative:	-0	No-Go Alternative:	+0
CUMULATIVE IMPACTS	Cumulative impacts to archaeological resources are difficult to assess due to the variable distribution and quality of archaeological surveys ion the area. However, our cumulative knowledge of the archaeology of the Karoo suggests that the cumulative impact of the Soyuz SPV Cluster and other projects within a 30km on archaeological resources is likely to be low.			
CONFIDENCE	High			
MITIGATION MEASURES	Avoid the lithic scatter at JKG007 and the rock gong (G005) through the implementation of a permanent no-go area or buffer around it. Report any chance finds of significant archaeological material to SAHRA and/or an archaeologist.			

Graves or Burials

Human graves or burials could be impacted almost anywhere on the site, but the probability of this happening during activities earthworks associated with the construction and decommissioning of the Project is extremely low and the significance rating is thus **very low negative** both without and with the implementation of mitigation measures.

IMPACT NATURE	Disturbance and/or destruction of graves or burials during construction and decommissioning	STATUS	VERY LOW NEGATIVE
Impact Description	Physical disturbance and/or destruction of graves or burials because of excavations and clearing.		
Impact Source(s)	Activities associated with the construction and decommissioning of the SPV facility		
Receptor(s)	Potential human graves or burials		

PARAMETER	WITHOUT MITIGATION	SCORE	WITH MITIGATION	SCORE
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
DURATION (B)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:	0	No-Go Alternative:	0
PROBABILITY (C)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-2	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	-8	Preferred Alternative:	4
	No-Go Alternative:	-0	No-Go Alternative:	+0
CUMULATIVE IMPACTS	Most historical graveyards are associated with farm complexes, whether still occupied or not, and are thus generally avoided in the planning and construction of project such as the Soyuz 1 SPV park. Although unmarked burials can occur anywhere within the landscape, the pre-colonial inhabitants of the area often buried their dead along river courses which are invariably excluded from developments due to their other environmental sensitivity. Overall, therefore, it is likely that the cumulative impacts of this project and others in the vicinity on graves and burials will be very low.			
CONFIDENCE	High			
MITIGATION MEASURES	Cease work immediately in the immediate area if human remains are encountered. Leave remains in situ and make site safe Report the finds to SAHRA and/or an archaeologist.			

Cultural Landscape

The cultural landscape is likely to be the heritage resource most affected by the construction of the SPV facility, but given that it is of low cultural significance, the potential impact is assessed to be **low negative**.

IMPACT NATURE	Alteration of the cultural landscape due to the presence of the SPV project	STATUS	LOW NEGATIVE
Impact Description	Alteration of the cultural landscape		
Impact Source(s)	Construction of the SPV facility		
Receptor(s)	Landscape in and around the SPV facility		

PARAMETER	WITHOUT MITIGATION	SCORE	WITH MITIGATION	SCORE
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
DURATION (B)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	0	No-Go Alternative:	0
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	3

	No-Go Alternative:	0	No-Go Alternative:	0
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-2	Preferred Alternative:	1
	No-Go Alternative:	0	No-Go Alternative:	0
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	-18	Preferred Alternative:	9
	No-Go Alternative:	-0	No-Go Alternative:	0
CUMULATIVE IMPACTS	Impacts on the cultural landscape could occur extensively if numerous projects are constructed close to one another and especially if these projects contain tall structural elements like turbines or powerlines. These impacts cannot be fully mitigated but the application of the recommendations of visual consultants would likely reduce the impacts from medium to low negative.			
CONFIDENCE	High			
MITIGATION MEASURES	Minimise disturbance footprint during construction and rehabilitate all disturbed areas that will not be needed during operation. At decommissioning, rehabilitate all areas following approved rehabilitation plan.			

11.2.7 Potential Noise Impact

Based on the available information, and the specialist noise it is reasonable to suggest that noise impacts are likely to be present during the construction phase of this Project. The following impacts have been scoped and assessed in the Scoping Phase of this Environmental Permitting Process and will be further detailed and assessed in the EIA Phase:

Noise may be generated by the construction activities and the use of construction equipment such as Graders, TLB's, front end loaders, drilling equipment, generators and cranes. The use of this equipment will create an increase in noise levels in the immediate vicinity of the construction activities and in some cases at some distance from the activities.

IMPACT NATURE	**Noise generated by construction equipment operation**		**STATUS**	**LOW NEGATIVE**
Impact Description	Change in the prevailing ambient noise levels in the vicinity of the construction activities.			
Impact Source(s)	Operation of construction vehicles and equipment.			
Receptor(s)	Farmhouses in the vicinity of the PVSEF			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1
DURATION (B)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:	2	No-Go Alternative:	2
PROBABILITY (C)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:	3	No-Go Alternative:	2
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-1	Preferred Alternative:	-1
	No-Go Alternative:	-2	No-Go Alternative:	-2
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-4**	Preferred Alternative:	**-4**
	No-Go Alternative:	**-12**	No-Go Alternative:	**-8**
CUMULATIVE IMPACTS	The noise level increase during the daytime will be below the nuisance threshold value of 7.0dBA.			

CONFIDENCE	High
MITIGATION MEASURES	Construction activities to take place during daytime only. All noise impact management measures as outlined within best practice guidelines pertaining to the construction industry will be considered during the EIA process and the development of the EMPr

11.2.8 Potential Social Impacts

Based on the available information, it is reasonable to suggest that the following social impacts are likely to be prevalent during the construction phase of this Project. The following impacts have been scoped and assessed by the Social Specialist in the Scoping Phase of this Environmental Permitting Process and will be further detailed and assessed in the EIA Phase:

Creation of Local Employment, Training and Business Opportunities

The construction phase of each PV SEFs will extend over a period of approximately 18 months and create in the region of 150 employment opportunities. Members from the local communities in the area, specifically Britstown and De Aar, would be in a position to qualify for most of the low skilled and semi-skilled employment opportunities. Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members of the community. Based on information from similar projects the total wage bill will be in the region of R 25 million (2023 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the local towns in the area.

IMPACT NATURE	Employment and business opportunities		**STATUS**	**MEDIUM POSITIVE**
Impact Description	Creation of employment and business opportunities during the construction phase			
Impact Source(s)	Construction and decommissioning activities			
Receptor(s)	Local and regional community			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	3	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	6	Preferred Alternative:	8
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**44**	Preferred Alternative:	**54**
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	This impact is direct and considered temporary			
RESIDUAL IMPACTS	Improved pool of skills and experience in the local area.			
CONFIDENCE	High			
CAN IMPACT BE ENHANCED	Yes			

ENHANCEMENT MEASURES	**Employment** ▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase. ▪ Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area. ▪ Where feasible, efforts should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria. ▪ Before the construction phase commences the proponent should meet with representatives from the ELM to establish the existence of a skills database for the area. If such as database exists, it should be made available to the contractors appointed for the construction phase. ▪ The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project. ▪ Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase. ▪ The recruitment selection process should seek to promote gender equality and the employment of women wherever possible **Business** ▪ The proponent should liaise with the ELM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g. construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work. ▪ Where possible, the proponent should assist local BBBEE companies to complete and submit the required tender forms and associated information. ▪ The ELM, in conjunction with the local business sector and representatives from the local hospitality industry, should identify strategies aimed at maximising the potential benefits associated with the project.

Impact of Construction Workers on Local Communities

The presence of construction workers poses a potential risk to family structures and social networks. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks. This risk is linked to potentially risky behaviour, mainly of male construction workers.

IMPACT NATURE	Social impact of construction workers		STATUS	MEDIUM NEGATIVE
Impact Description	Potential social impacts due to presence of construction workers and potential impacts on family structures and social networks.			
Impact Source(s)	Construction and decommissioning activities			
Receptor(s)	Local and regional community			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:		No-Go Alternative:	

DURATION (B)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	6	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**30**	Preferred Alternative:	**21**
	No-Go Alternative:		No-Go Alternative:	
Reversibility	No in the case of HIV and AIDs			
CUMULATIVE IMPACTS	This impact is direct and considered temporary			
RESIDUAL IMPACTS	Impacts on family and community relations that may, in some cases, persist for a long period of time. Also, in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.			
CONFIDENCE	High			
CAN IMPACT BE MITIGATED	Yes, to some degree. However, the risk cannot be eliminated			
MITIGATION MEASURES	▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase. ▪ Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase. ▪ The SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to report resolve incidents. ▪ Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories. ▪ The proponent should consider the option of establishing a Monitoring Committee (MC) for the construction phase that representatives from local landowners, farming associations, and the local municipality. This MC should be established prior to commencement of the construction phase and form part of the SEP. ▪ The proponent and contractor should develop an agreement for construction workers. The agreement should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be subject to appropriate disciplinary action and/or dismissed. All dismissals must comply with the South African labour legislation. The agreement should be signed by the proponent and the contractors before the contractors move onto site. The agreement should form part of the CHSSP. ▪ The proponent and the contractor should implement an HIV/AIDS, COVID-19 and Tuberculosis (TB) awareness programme for all construction workers at the outset of the construction phase. The programmes should form part of the CHSSP. ▪ The contractor should provide transport for workers to and from the site daily. This will enable the contactor to effectively manage and monitor the movement of construction workers on and off the site. ▪ The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days for their contract ending. ▪ No construction workers, except for security personnel, should be permitted to stay over-night on the site.			

Influx of Job Seekers

Large construction projects tend to attract people to the area in the hope that they will secure a job, even if it is a temporary job. These job seekers can in turn become "economically stranded" in the area or decide to stay on irrespective of finding a job or not. The main areas of concern associated with the influx of job seekers include:

- Impacts on existing social networks and community structures.
- Competition for housing, specifically low-cost housing.
- Competition for scarce jobs.
- Increase in incidences of crime.

IMPACT NATURE	Influx of job seekers		STATUS	LOW NEGATIVE
Impact Description	Potential social impacts because of influx of job seekers (migrant workers) to the area.			
Impact Source(s)	Construction and decommissioning activities			
Receptor(s)	Local and regional community			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**18**	Preferred Alternative:	**15**
	No-Go Alternative:		No-Go Alternative:	
Reversibility	No in the case of HIV and AIDs			
CUMULATIVE IMPACTS	This impact is direct and considered temporary			
RESIDUAL IMPACTS	Impacts on family and community relations that may, in some cases, persist for a long period of time. Also, in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.			
CONFIDENCE	LOW			
CAN IMPACT BE MITIGATED	Yes, to some degree. However, the risk cannot be eliminated			
MITIGATION MEASURES	It is impossible to stop people from coming to the area in search of employment. However, as indicated above, the proponent should ensure that the employment criteria favour residents from the area. In addition: • Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase. • Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase. • The proponent, in consultation with the ELM, should investigate the option of establishing a MC to monitor and identify potential problems that may arise due to the influx of job seekers to the area.			

	• The proponent should implement a "locals first" policy, specifically regarding unskilled and low skilled opportunities. • The proponent should implement a policy that no employment will be available at the gate.

Risk to safety, livestock, and farm infrastructure

The presence on and movement of construction workers on and off the site poses a potential safety threat to local famers and farm workers in the vicinity of the site. In addition, farm infrastructure, such as fences and gates, may be damaged and stock losses may also result from gates being left open and/or fences being damaged, or stock theft linked either directly or indirectly to the presence of farm workers on the site.

IMPACT NATURE	Farm safety		STATUS	LOW NEGATIVE
Impact Description	Potential risk to safety of farmers and farm workers, livestock and damage to farm infrastructure associated with the presence of construction workers on site			
Impact Source(s)	Construction and decommissioning activities			
Receptor(s)	Local and regional community			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	3	Preferred Alternative:	1
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	6	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**33**	Preferred Alternative:	**24**
	No-Go Alternative:		No-Go Alternative:	
Reversibility	Yes, compensation paid for stock losses and damage to farm infrastructure etc.			
CUMULATIVE IMPACTS	This impact is direct and considered temporary			
RESIDUAL IMPACTS	No, provided losses are compensated for.			
CONFIDENCE	LOW			
CAN IMPACT BE MITIGATED	Yes			
MITIGATION MEASURES	▪ The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences. ▪ All farm gates must be closed after passing through. ▪ Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers to and from the site. ▪ The proponent should consider the option of establishing a MF (see above) that includes local farmers and develop an agreement for construction workers. This committee should be established prior to commencement of the construction			

	phase. The agreement should be signed by the proponent and the contractors before the contractors move onto site. ▪ The proponent should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the agreement to be signed between the proponent, the contractors, and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below). ▪ The Environmental Management Plan (EMP) must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested. ▪ Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the agreement, specifically consequences of stock theft and trespassing on adjacent farms. ▪ Contractors appointed by the proponent must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the agreement. All dismissals must be in accordance with South African labour legislation. ▪ It is recommended that no construction workers, except for security personnel, should be permitted to stay over-night on the site.

Increased Risk of Grass Fires

The presence of construction workers and construction-related activities on the site poses an increased risk of grass fires that could, in turn pose, a threat to livestock, crops, wildlife and farm infrastructure. The potential risk of grass fires will be higher during the dry, windy winter months from May to October.

IMPACT NATURE	Fire damage		**STATUS**	**LOW NEGATIVE**
Impact Description	Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of grass fires			
Impact Source(s)	Construction and decommissioning activities			
Receptor(s)	Local and regional community			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	4	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	6	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**36**	Preferred Alternative:	**24**
	No-Go Alternative:		No-Go Alternative:	
Reversibility	Yes, compensation paid for stock and crop losses etc.			
CUMULATIVE IMPACTS	This impact is direct and considered temporary			

RESIDUAL IMPACTS	No, provided losses are compensated for.
CONFIDENCE	LOW
CAN IMPACT BE MITIGATED	Yes
MITIGATION MEASURES	• The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences. ▪ Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas. ▪ Smoking on site should be confined to designated areas. ▪ Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high-risk dry, windy winter months. ▪ Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle. ▪ Contractor should provide fire-fighting training to selected construction staff. ▪ No construction staff, except for security staff, to be accommodated on site overnight. ▪ As per the conditions of the agreement, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.

Nuisance Impacts

Construction related activities, including the movement of heavy construction vehicles of and on the site, has the potential to create dust, noise and safety impacts and damage roads. The impacts will be largely local and can be effectively mitigated. The number of potentially sensitive social receptors, such as farmsteads, will also be low due to the sparse settlement patterns and small number of farmsteads in the area.

IMPACT NATURE	Nuisance impacts		STATUS	LOW NEGATIVE
Impact Description	Potential noise, dust and safety impacts associated with construction related activities			
Impact Source(s)	Construction and decommissioning activities			
Receptor(s)	Local and regional community			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	6	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	

SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**30**	Preferred Alternative:	**15**
	No-Go Alternative:		No-Go Alternative:	
Reversibility	Yes, compensation paid for stock and crop losses etc.			
CUMULATIVE IMPACTS	This impact is direct and considered temporary			
RESIDUAL IMPACTS	If damage to local farm roads is not repaired then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage.			
CONFIDENCE	HIGH			
CAN IMPACT BE MITIGATED	Yes			
MITIGATION MEASURES	The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include: • The movement of construction vehicles on the site should be confined to agreed access road/s. • Establishment of a Grievance Mechanism that provides local farmers and other road users with an effective and efficient mechanism to address issues related to construction related impacts, including damage to local gravel farm roads. • The movement of heavy vehicles associated with the construction phase should be timed to avoid times days of the week, such as weekends, when the volume of traffic travelling along the access roads may be higher. • Establishment of a Grievance Mechanism that provides local farmers and other road users with an effective and efficient mechanism to address issues related to construction related impacts, including damage to local gravel farm roads. • Dust suppression measures should be implemented, such as wetting on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. • All vehicles must be road worthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.			

Impacts Associated with Loss of Farmland

The activities associated with the construction phase and establishment of the proposed project and associated infrastructure will result in the disturbance and loss of land available for grazing. The impact on farmland associated with the construction phase can be mitigated by minimising the footprint of the construction related activities and ensuring that disturbed areas are fully rehabilitated on completion of the construction phase.

IMPACT NATURE	**Loss of farmland**		**STATUS**	**LOW NEGATIVE**
Impact Description	The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the project etc. will damage farmlands and result in a loss of farmlands for grazing.			
Impact Source(s)	Construction and decommissioning activities			
Receptor(s)	Local and regional community			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**

EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	5	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	6	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**36**	Preferred Alternative:	**20**
	No-Go Alternative:		No-Go Alternative:	
Reversibility	Yes, disturbed areas can be rehabilitated			
CUMULATIVE IMPACTS	This impact is direct and considered temporary			
RESIDUAL IMPACTS	Overall loss of farmland could affect the livelihoods of the affected farmers, their families, and the workers on the farms and their families. However, disturbed areas can be rehabilitated.			
CONFIDENCE	HIGH			
CAN IMPACT BE MITIGATED	Yes			
MITIGATION MEASURES	The potential impacts associated with damage to, and loss of farmland can be effectively mitigated. The aspects that should be covered include: • An Environmental Control Officer (ECO) should be appointed to monitor the construction phase. • Existing internal roads should be used where possible. If new roads are required, these roads should be rehabilitated on completion of the construction phase. • The footprint associated with the construction related activities (access roads, construction camps, workshop etc.) should be minimised. • All areas disturbed by construction related activities, such as access roads on the site, construction camps etc., should be rehabilitated at the end of the construction phase. • The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation programme should be included in the EMPr. • The implementation of the Rehabilitation Programme should be monitored by the ECO.			

11.2.9 Potential Traffic Impacts

The traffic specialist has concluded the following regarding potential traffic impacts:

- Access to the site is possible and feasible.
- Haul routes to the site can be identified and is possible via national and provincial roads to the site.
- The existing major roadways have adequate capacity to accommodate construction as well as operational traffic.
- The site access roads will have to be constructed to an acceptable standard to accommodate the construction vehicles.

The traffic impacts will be evaluated during the EIA phase.

11.2.10 Potential Visual Impacts

Based on the available information and the visual impact scoping report, it is reasonable to suggest that the following visual impacts are likely to be prevalent during the construction phase of this Project. The following impacts have been scoped by the Visual Specialist in the Scoping Phase and will be further detailed and assessed in the EIA Phase

The visual impact scoping report has identified the following potential visual impacts associated with the construction phase:

- Development activities such as vegetation clearing, vehicular movement, rubble dumping, and associated construction will lead to changes in the landscape character and sense of place, visual exposure and visibility;
- Excavation activities related to the development of foundations for the substations and solar panels, resulting in dust generation, leading to visual exposure and visibility;
- Construction and operation activities taking place on both sides of the road, and within close proximity to the Witfontein Trust Farm farmstead and other farmstead, leading to visual contrast, a change in the landscape character and thus a high visual intrusion on these receptors.

IMPACT NATURE	Visual changes caused by construction activities		STATUS	LOW NEGATIVE
Impact Description	Visual changes altering the sense of place (vegetation removal, materials storage, equipment storage, waste handling) and dust generation.			
Impact Source(s)	Construction and decommissioning			
Receptor(s)	Farmhouses in the vicinity of Soyuz Solar Park 2			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1
DURATION (B)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	3	No-Go Alternative:	3
PROBABILITY (C)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:	23	No-Go Alternative:	2
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-3	Preferred Alternative:	-2
	No-Go Alternative:	1	No-Go Alternative:	1
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-6**	Preferred Alternative:	**-4**
	No-Go Alternative:	**6**	No-Go Alternative:	**6**
CUMULATIVE IMPACTS	The visual impacts during construction are considered direct and temporary			
CONFIDENCE	Medium			
MITIGATION MEASURES	From a visual aspect, there are no fatal flaws associated with the Soyuz 4 Solar PV Park should the recommended buffer zones for the gravel road and Windpoort Country Guest House and Cottage be considered. The visual impacts associated with the Soyuz 4 Solar PV Park will be assessed in detail in the EIA phase and management and mitigatory measures will be presented in line with the mitigation hierarchy.			

11.3 POTENTIAL OPERATIONS IMPACTS

11.3.1 Potential Avifaunal Impacts

Many of the potential avifauna impacts are associated with the completed facility structures and their location in association to sensitive landscapes. Addressing these potential impacts is undertaken during the design phase and these impacts are therefore assessed in the construction phase as all design requirements to mitigate against impacts should be finalised prior to construction.

Collisions with Panels

Potential impact on avifaunal species due to Collision of birds with panels and other infrastructure. There is a chance that birds will collide with the PV panels, as they do with the windows of buildings. This could be during the normal course of their daily activities or when they are attracted to the panels, perhaps mistaking them for water sources, the so called "lake effect." It is important to stress that this impact will probably only become significant when large numbers of birds are in the vicinity of the facility. For this reason, the more sensitive species in terms of this impact are likely to be the gregarious, flocking species which are mostly not threatened species in this study area.

IMPACT NATURE	Collision with PV panels		STATUS	MEDIUM NEGATIVE
Impact Description	Direct mortality of individual birds due to collision with PV panels			
Impact Source(s)	Solar PV and electrical transmission infrastructure			
Receptor(s)	All birds.			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:	1	No-Go Alternative:	1
DURATION (B)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	2	No-Go Alternative:	2
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	1	No-Go Alternative:	1
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-3	Preferred Alternative:	-3
	No-Go Alternative:	1	No-Go Alternative:	1
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-54**	Preferred Alternative:	**-54**
	No-Go Alternative:	**2**	No-Go Alternative:	**2**
CUMULATIVE IMPACTS	This impact could be cumulative.			
CONFIDENCE	Low			
MITIGATION MEASURES	▪ White strips or simply the exposed (lustrous) aluminium frames along the edges of the solar panels appear to help to increase visibility and deter birds and are recommended as far as practically feasible. ▪ Installation of bird deterrent devices on and around solar panels and on transmission line poles, pylons and / or monopoles as well as security/boundary fences, will be required to limit collision risk. ▪ This potential impact will be assessed in detail as part of the specialist study of the EIA process and additional mitigation measures provided.			

Sensory Disturbance

Security lighting is an essential part of solar PV facilities. Security lighting can affect crepuscular and nocturnal behaviour of birds and may also affect nesting and feeding patterns or potential. Security lighting may cause certain species to relocate to alternative territories. In addition, lighting can blind some species to overhead structures and increase collisions with these structures at night

IMPACT NATURE	Sensory disturbance		STATUS	NEGATIVE
Impact Description	Sensory disturbance because of night-time security lighting and increase in potential collisions and mortality.			
Impact Source(s)	Night-time lighting			
Receptor(s)	Primarily crepuscular and nocturnal species			
PARAMETER	WITHOUT MITIGATION	SCORE	WITH MITIGATION	SCORE
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	This impact could be cumulative.			
CONFIDENCE	High			
MITIGATION MEASURES	Minimise light pollution and fit external lighting with downward facing hoods.			

11.3.2 Potential Biodiversity Impacts

The potential biodiversity impacts are associated with the completed facility structures and their location in association to sensitive landscapes/habitats. Addressing these potential impacts is undertaken during the design phase and these impacts are therefore assessed in the construction phase as all design requirements to mitigate against impacts should be finalised prior to construction.

11.3.3 Potential Climate Change Impacts

Based on the available information, it is reasonable to suggest that establishment of the proposed PVSEF will have an impact during operations phase on the contribution to renewable energy goals of South Africa. The establishment of additional renewable energy facilities is considered significant considering the renewable energy targets set by South Africa. An additional 300MW, improves the capacity available to South African's, in a sustainable and environmentally responsible manner. Based on the available information it is reasonable to suggest that the impact will potentially have a **high positive** impact.

IMPACT NATURE	Contribution to renewable energy goals of South Africa		STATUS	HIGH POSITIVE
Impact Description	The establishment of additional renewable energy facilities is considered significant.			
Impact Source(s)	Operation of PVSEF and associated infrastructure.			
Receptor(s)	Local, provincial and national community			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	3	No-Go Alternative:	3
DURATION (B)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	2	No-Go Alternative:	2
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	3	No-Go Alternative:	3
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	-2	No-Go Alternative:	-2
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**81**	Preferred Alternative:	**81**
	No-Go Alternative:	**-36**	No-Go Alternative:	**-36**
CUMULATIVE IMPACTS	This impact is considered cumulative. The 'No Go' option is a direct opportunity loss for South Africa to increase renewable energy.			
CONFIDENCE	High			
MITIGATION MEASURES	None required			

Contribution to Greenhouse Gas Reduction

Based on the available information, it is reasonable to suggest that establishment of the proposed PVSEF will have an impact during operations phase on the Contribution to Greenhouse Gas (GHG) Reduction Facilities for South Africa.

IMPACT NATURE	Contribution to Greenhouse Gas Reduction in South Africa		STATUS	MEDIUM POSITIVE
Impact Description	The establishment of additional renewable energy facilities is considered significant in light of South Africa's commitments to GHG reduction.			
Impact Source(s)	Operation of PVSEF and associated infrastructure.			
Receptor(s)	Local, provincial and national community			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	3	No-Go Alternative:	3
DURATION (B)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	3	No-Go Alternative:	3
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	3	No-Go Alternative:	3
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	-3	No-Go Alternative:	-3
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**81**	Preferred Alternative:	**81**
	No-Go Alternative:	**-81**	No-Go Alternative:	**-81**

CUMULATIVE IMPACTS	Cumulatively, assuming the hybrid facility replaces generative capacity from other fossil fuel sources, the facility could lower South Africa's GHG emissions from the Energy sector since the PV arrays and BESS provide renewable energy at a lower carbon dioxide equivalent (CO2-e)1 emission per unit electricity.
CONFIDENCE	High
MITIGATION MEASURES	None required

11.3.4 Potential Freshwater Impacts

Most of the potential impacts to surface water resources are associated with the completed facility structures and their location in association to aquatic environments associated with the development site. Addressing these potential impacts is undertaken during the design phase and these impacts are therefore assessed in the construction phase as all design requirements to mitigate against impacts should be finalised prior to construction. However, operational activities do have the potential to cause contamination of surface water if not properly managed.

Surface Water Quality Impacts

Minor contamination of surface water run-off could occur because of leaks and spills from the few on site vehicles and equipment. In addition, the washing of the PV panels to remove dust and debris could also contribute to surface water contamination.

IMPACT NATURE	**Surface water quality impact**		**STATUS**	**LOW NEGATIVE**
Impact Description	Contaminated run-off from areas where spills or leaks could occur or from washing down of the panels could impact negatively on surface water quality			
Impact Source(s)	Operation and maintenance of PVSEF and associated infrastructure.			
Receptor(s)	Off-site aquatic environment			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	The impact could be cumulative.			
CONFIDENCE	Low			
MITIGATION MEASURES	This potential impact will be assessed in more detail as part of the EIA phase.			

11.3.5 Potential Noise Impact

There are several potential sources of noise generation associated with the operational phase of the PVSEF. The operational phase noise impacts have been assessed by the noise specialist.

IMPACT NATURE	Noise generated by operations		STATUS	LOW NEGATIVE
Impact Description	Change in ambient noise levels in the vicinity of the central inverter, BESS, sub-station, O&M building and access and site roads,			
Impact Source(s)	Ventilation fans and vehicle engines			
Receptor(s)	Nearby farmhouse and employees			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	-1	No-Go Alternative:	-1
DURATION (B)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:	-4	No-Go Alternative:	-4
PROBABILITY (C)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:	-3	No-Go Alternative:	-2
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	-2	No-Go Alternative:	-2
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**8**	Preferred Alternative:	**8**
	No-Go Alternative:	**-24**	No-Go Alternative:	**-24**
CUMULATIVE IMPACTS	The noise level change during the power generation activities is expected to be below the nuisance threshold value of 7.0dBA.			
CONFIDENCE	High			
MITIGATION MEASURES	This potential impact will be assessed in more detail as part of the EIA phase.			

11.3.6 Potential Social Impacts

Improve Energy Security and support renewable energy sector

The primary goal of the proposed project is to improve energy security in South Africa by generating additional energy. The proposed SEF also reduces the carbon footprint associated with energy generation. The project should therefore be viewed within the context of the South Africa's current reliance on coal powered energy to meet most of its energy needs, and secondly, within the context of the success of the REIPPPP.

IMPACT NATURE	Energy security	STATUS	HIGH POSITIVE
Impact Description	Development of infrastructure to improve energy security and support the renewable sector		
Impact Source(s)	Operational of the PVSEF		
Receptor(s)	Local, provincial and regional communities		

PARAMETER	WITHOUT MITIGATION	SCORE	WITH MITIGATION	SCORE
EXTENT (A)	Preferred Alternative:	4	Preferred Alternative:	5
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	4	Preferred Alternative:	5
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	8	Preferred Alternative:	8
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**64**	Preferred Alternative:	**85**
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	This impact is cumulative			
RESIDUAL IMPACTS	Overall reduction in CO_2 emission, reduction in water consumption for energy generation, contribution to establishing an economically viable commercial renewables generation sector in the Northern Cape and South Africa.			
CONFIDENCE	High			
CAN IMPACT BE ENHANCED	Yes			
ENHANCEMENT MEASURES	Should the project be approved, the applicant should: ▪ Implement a skills development and training programme aimed at maximizing the number of employment opportunities for local community members. ▪ Maximise opportunities for local content, procurement, and community shareholding.			

Creation of Employment Opportunities

Each PVSEF will create in the region of 40-50 employment opportunities during the operational phase, of which 70% will be unskilled, 25% semi-skilled 25%, and 5% skilled 5%. Most of the unskilled and low skilled workers will be local HDI residents of Britstown and De Aar. Based on similar projects the annual operating budget will be in the region of R 30 million (2023 Rand values), including wages.

IMPACT NATURE	Employment opportunities and social upliftment		STATUS	MEDIUM POSITIVE
Impact Description	Creation of employment and business opportunities associated with the operational phase			
Impact Source(s)	Operation of the PVSEF			
Receptor(s)	Local communities			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	2	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
	Preferred Alternative:	**28**	Preferred Alternative:	**40**

SIGNIFICANCE RATING (F) = (A*B*D)*C	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	This impact is cumulative			
RESIDUAL IMPACTS	Creation of permanent employment and skills development opportunities for members from the local community and creation of additional business and economic opportunities in the area			
CONFIDENCE	High			
CAN IMPACT BE ENHANCED	Yes			
ENHANCEMENT MEASURES	The enhancement measures listed in the construction phase social impact assessment i.e. to enhance local employment and business opportunities during the construction phase, also apply to the operational phase.			

Generate Income for affected landowner

The proponent will enter into rental agreements with the affected landowners for the use of the land for the establishment of the proposed PV SEFs. In terms of the rental agreement the affected landowner will be paid an annual amount dependent upon the area affected. The additional income will reduce the risk to his livelihoods posed by droughts and fluctuating market prices for sheep and farming inputs, such as fuel, feed etc. Given the low carrying capacity of the veld the additional income represents a significant benefit for the affected landowner.

IMPACT NATURE	**Income generation for landowner**		**STATUS**	**HIGH POSITIVE**
Impact Description	The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for sheep and farming inputs, such as feed etc.			
Impact Source(s)	Operational of the PVSEF			
Receptor(s)	Local communities			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	3
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	5
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	4	Preferred Alternative:	6
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**27**	Preferred Alternative:	**65**
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	This impact is cumulative			
RESIDUAL IMPACTS	Support for local agricultural sector and farming			
CONFIDENCE	High			

CAN IMPACT BE ENHANCED	Yes
ENHANCEMENT MEASURES	Implement agreements with affected landowners.

Socio-economic development impacts

The REIPPPP has been designed not only to procure energy but has also been structured to contribute to the broader national development objectives of job creation, social upliftment and broadening of economic ownership. Socio-economic development (SED) contributions are an important focus of the REIPPPP and are aimed at ensuring that local communities benefit directly from the investments attracted into the area. These contributions are linked to Community Trusts and accrue over the project operation life and, in so doing, create an opportunity to generate a steady revenue stream over an extended period. This revenue can be used to fund development initiatives in the area and support the local community. The long-term duration of the revenue stream also allows local municipalities and communities to undertake long term planning for the area. The revenue from the proposed SEF can be used to support a number of social and economic initiatives in the area, including:

- Creation of jobs.
- Education.
- Support for and provision of basic services.
- School feeding schemes.
- Training and skills development.
- Support for SMME's.

IMPACT NATURE	**Improve socio-economic development**		**STATUS**	**HIGH POSITIVE**
Impact Description	Benefits associated with support for local community's form SED contributions			
Impact Source(s)	Operation of the PVSEF			
Receptor(s)	Local communities			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	2	Preferred Alternative:	3
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	5
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	4	Preferred Alternative:	6
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**30**	Preferred Alternative:	**65**
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	This impact is cumulative			
RESIDUAL IMPACTS	Promotion of social and economic development and improvement in the overall well-being of the community			

CONFIDENCE	High
CAN IMPACT BE ENHANCED	Yes
ENHANCEMENT MEASURES	To maximise the benefits and minimise the potential for corruption and misappropriation of funds the following measures should be implemented: • The proponents should liaise with the ELM to identify projects that can be supported by SED contributions. • Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community. • Strict financial management controls, including annual audits, should be instituted to manage the SED contributions.

Potential impact on property values

The potential visual impacts associated with the proposed PVSEFs have the potential to impact on property values. Based on the results of a literature review undertaken for wind farms the potential impact on property values in rural areas is likely to be limited. The findings are also likely to be relevant to PVSEFs.

IMPACT NATURE	**Impact on property values**		**STATUS**	**LOW NEGATIVE**
Impact Description	Potential impact of the SEF on property values			
Impact Source(s)	Operational of the PVSEF			
Receptor(s)	Local communities			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**24**	Preferred Alternative:	**21**
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	This impact is cumulative			
RESIDUAL IMPACTS	Linked to visual impact on sense of place.			
CONFIDENCE	High			
CAN IMPACT BE MITIGATED	Yes			
MITIGATION MEASURES	The recommendations contained in the VIA should be implemented.			

Potential Tourism Impacts

The potential visual impacts associated with the proposed PVSEF has the potential to impact on tourism facilities and tourism in the area. Based on the findings of the literature review there is limited evidence to suggest that the proposed PVSEF would impact on the tourism in the PKSDM and ELM at a local and regional level. The potential impact on local tourism facilities in the vicinity of the sites will be confirmed during the Assessment Phase.

IMPACT NATURE	Impact on tourism operations		STATUS	LOW NEGATIVE
Impact Description	Potential impact of the PVSEF on local tourism			
Impact Source(s)	Operation of the PVSEF			
Receptor(s)	Local communities			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	2	Preferred Alternative:	1
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:	4	Preferred Alternative:	4
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	2	Preferred Alternative:	2
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**24**	Preferred Alternative:	**21**
	No-Go Alternative:		No-Go Alternative:	
CUMULATIVE IMPACTS	This impact is cumulative			
RESIDUAL IMPACTS	Linked to visual impact on sense of place.			
CONFIDENCE	High			
CAN IMPACT BE MITIGATED	Yes			
MITIGATION MEASURES	The recommendations contained in the VIA should be implemented.			

11.3.7 Potential Traffic Impact

The operation traffic impacts will be evaluated during the EIA phase.

11.3.8 Potential Visual Impacts

The potential visual impacts are associated with the completed facility structures and their location in association to sensitive receptors. Addressing these potential impacts is undertaken during the design phase and these impacts are therefore assessed in the construction phase as all design requirements to mitigate against impacts should be finalised prior to construction.

11.3.9 Potential Water Management Impacts

Potential water impacts as a result from improper waste management practices on site during the operations of the PV facility related to cleaning of the PV panels. Washing is anticipated to be undertaken on a quarterly basis. It is envisaged to collect and store runoff from the solar panels onsite

for washing the panels. Based on the available information it is reasonable to suggest that the impact will potentially have a **low negative** impact.

IMPACT NATURE	Water management impacts		STATUS	LOW NEGATIVE
Impact Description	Potential water impacts because of improper water use practices on site relating primarily to the cleaning of the PV panels. Washing of the PV panels is anticipated to occur quarterly. It is envisaged to collect and store run-off from the solar panels on site for washing.			
Impact Source(s)	Operation of the PVSEF			
Receptor(s)	Immediate site and receiving environment			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1
DURATION (B)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	2	No-Go Alternative:	2
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	2
	No-Go Alternative:	2	No-Go Alternative:	2
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-2	Preferred Alternative:	-2
	No-Go Alternative:	1	No-Go Alternative:	1
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-18**	Preferred Alternative:	**-12**
	No-Go Alternative:	**4**	No-Go Alternative:	**4**
CUMULATIVE IMPACTS	This impact could be cumulative.			
CONFIDENCE	High			
MITIGATION MEASURES	Water from boreholes will be used to wash the panels and this water will be recovered and reused to wash the panels again.			

Potential Waste Management Impacts

Potential waste impacts as a result from improper waste management practices on site during the management of the proposed PVSEF. Based on the available information it is reasonable to suggest that the impact will potentially have a **low negative** impact.

IMPACT NATURE	Waste management impacts		STATUS	LOW NEGATIVE
Impact Description	Potential waste impacts due to the operations of the PVSEF and the decommissioning or replacement of PV panels			
Impact Source(s)	Operation of the PVSEF			
Receptor(s)	Immediate site and receiving environment			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1

DURATION (B)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	2	No-Go Alternative:	2
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	3
	No-Go Alternative:	2	No-Go Alternative:	2
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-1	Preferred Alternative:	1
	No-Go Alternative:	-2	No-Go Alternative:	-2
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-9**	Preferred Alternative:	**9**
	No-Go Alternative:	**-8**	No-Go Alternative:	**-8**
CUMULATIVE IMPACTS	This impact could be cumulative.			
CONFIDENCE	Medium			
MITIGATION MEASURES	All mitigation measures as obtained within best practice guidelines pertaining to waste management will be considered during the EIA phase.			

11.4 DECOMISSIONING PHASE IMPACTS

Certain generic decommissioning phase impacts related to the deconstruction of the PVSEF such as vehicle operation, materials/waste storage etc are similar as the construction phase activities. In addition, at the time of decommissioning, the PVSEF will require environmental authorisation following a Basic Assessment process. This process will identify the specific environmental impacts potentially associated with decommissioning at that time.

However, the intention of the assessment of potential decommissioning phase impacts at this stage is to determine if the decommissioning phase is likely to generate environmental impacts that could be considered fatal flaws post-operation.

Management of Solar Panel Waste

Currently there is very limited potential worldwide regarding the recycling of used of discarded PV solar panels and there is currently no system for managing PV solar panel waste in South Africa. As the number of solar PVSEF's in this region increase, there is a potential for this waste stream to inundate a region which does not have the required waste management skills and infrastructure. At this Scoping Phase of assessment, due to the lack of detailed knowledge relating to the handling of used or discarded solar PV panels, this potential environmental impact is assessed as High Negative.

IMPACT NATURE	**Handling of Solar PV panel waste**	**STATUS**	**LOW NEGATIVE**
Impact Description	As the number of solar PVSEF's in this region increase, there is a potential for this waste stream to inundate a region which does not have the required waste management skills.		
Impact Source(s)	Decommissioning of the PVSEF		
Receptor(s)	Immediate site and receiving environment		

PARAMETER	WITHOUT MITIGATION	SCORE	WITH MITIGATION	SCORE
EXTENT (A)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
DURATION (B)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
PROBABILITY (C)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:		Preferred Alternative:	
	No-Go Alternative:		No-Go Alternative:	
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-9**	Preferred Alternative:	**9**
	No-Go Alternative:	**-8**	No-Go Alternative:	**-8**
CUMULATIVE IMPACTS	This impact will be cumulative.			
CONFIDENCE	Low			
MITIGATION MEASURES	Additional information regarding the management of solar PV panel waste will be obtained during the detailed EIA phase information and assessment process.			

11.4.1 SUMMARY OF IMPACTS

The proposed establishment and operation of the Soyuz 4 Solar PV Park in its current format at Scoping Phase has been rigorously assessed by a social and environmental team of independent professionals to accurately present identified scoping level opportunities and constraints and identify preliminary potential social and environmental impacts.

The information presented in this scoping phase has confirmed that there are no social or environmental flaws that cannot be mitigated and would exclude the development from proceeding.

A broad development footprint has been identified at Scoping Phase to allow the Professional Team and Applicant to focus their detailed assessments during the EIA Phase to arrive at a fine scale development footprint for the development, within an area that has been pre-determined at Scoping Phase to be acceptable for the Project.

As part of the environmental authorisation process, the current proposal will also be informed by comments from stakeholders and the authorities, and which will be used by the Professional Team as part of the EIA Phase of the Project to ensure an optimised Project Layout from a technical and environmental perspective to be presented as part of the upcoming EIA Report for Public Comment.

The Scoping level impact assessment above has also indicated that based on the available information and using all the impact criteria identified by the EAP, Professional Team and Applicant, that the 'preferred alternative' is more favourable to implement than the 'no-go' alternative and that no fatal flaws have presented during the rigorous assessment process.

Based on the above, it is recommended that the permitting process proceed to the detailed EIA Phase of the statutory process.

12 BULK SERVICES

12.1 ROADS

Construction access to the site will be via existing and new access roads created off Witpoort Road. The construction accesses should be located at positions with clear site lines along the road to ensure shoulder sight distance of at least 300m along the road from the access positions. The access locations will be confirmed during the assessment phase.

The roads will be gravelled level roads. Access roads will be 8m wide and will follow existing roads as far as practicable. Internal roads will be 4m wide.

12.2 WATER

Water supplies required during the construction phase will be brought on site by Licensed Contractors. The water for the PVSEF operations will be sourced from boreholes on the site.

12.3 ELECTRICITY

Electricity will be sourced from generator sets as and when required.

12.4 SEWAGE

Conservancy tanks would be established on site and these will be serviced by a licensed service provider.

12.5 SOLID WASTE

Designated areas will be allocated for waste storage and removal and serviced by a licensed service provider to eliminate the waste at a licensed waste site. Chain of custody documents will be kept on site to ascertain amounts and ensure the waste is deposed of at licensed waste fill sites.

13 PUBLIC PARTICIPATION PROCESS

*In accordance with **Appendix 1 Regulation 2(h)(ii, iii) of GN No. R. 326 of the NEMA EIA Regulations (2014, as amended**), the following information is presented in Section 12:*

> ***2(h) ii** – Details of the Public Participation Process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs*
> ***2(h) 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.*

13.1 OBJECTIVES OF THE PUBLIC PARTICIPATION PROCESS

The public consultation process is requirements of the NEMA EIA Regulations (2014 as amended) GNR 982 Regulation 41. The Regulation aims at ensuring that all information pertaining to this

Environmental Permitting Process is adequately circulated to all Interested and Affected Parties (I&APs) and further provides the I&APs with timeframes within which to provide feedback throughout the EIA process. This PPP thus aims at providing organisations and individuals with an opportunity to raise concerns and make comments and suggestions regarding the proposed Project.

The principles for the Scoping and EIA that determine communication with all I&APs at large are included in the principles of the National Environmental Management Act (NEMA) (Act 107 of 1998, as amended) and are further highlighted in the DEA&DP EIA Guideline and Information Document Series (March 2013) which states that: "Public participation process means a process by which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to an application."

Public participation is an essential and regulatory requirement for an environmental authorisation process and must be undertaken in terms of the Environmental Impact Assessment (EIA) Regulations GN R.982 (December 2014). Public participation is a process that is intended to lead to a joint effort by stakeholders, technical specialists, the authorities and the proponent/developer who work together to produce better decisions than if they had acted independently.

Internationally, the public consultation process complies with the Equator Principles (in particular Principles 5 and 6) and the IFC Performance Standards (PS) (specifically PSs 1, 2, 4, 5, 7 and 8). A Stakeholder Engagement Plan (SEP) provides a more comprehensive summary of the local regulatory requirements and international standards that were considered in the design of the public consultation process.

The public participation process is designed to provide sufficient and accessible information to Interested and Affected Parties (I&APs) in an objective manner.

During the Scoping Phase to enable them to:

- Understand the context of the EIA;
- Become informed and educated about the proposed project and its potential impacts;
- Raise issues of concern and suggestions for enhanced benefits;
- Verify that their comments, issues of concern and suggestions have been recorded;
- Assist in identifying reasonable alternatives; and
- Contribute relevant local information and traditional knowledge to the environmental assessment.

During the impact assessment phase to assist them to:

- Contribute relevant information and local and traditional knowledge to the environmental assessment;
- Verify that their issues and suggestions have been evaluated and considered in the environmental investigations and feedback has been provided;
- Comment on the findings of the EIA; and
- Identify further issues of concern from the findings of the EIA.

During the decision-making phase:

- To advise I&APs of the outcome, i.e. the authority decision, and how the decision can be appealed.

13.2 STEPS TAKEN TO NOTIFY POTENTIALLY INTERESTED AND AFFECTED PARTIES

Identification of Stakeholders

After obtaining the relevant site information, the Landowners, Adjacent Landowners, Relevant Conservation Groups, and Competent and Commenting Authorities will be contacted to obtain owner/occupant details for directly adjacent erven as well as key stakeholders for this Project. In terms of the NEMA EIA Regulations (2014 as amended), notification of directly adjacent landowners and occupiers is required. The EAP is satisfied that the Public Participation Process will be consistent with the requirements of Regulations.

Communication with Stakeholders

In terms of the NEMA EIA Regulations (2014 as amended), potential Interested and Affected Parties (I&AP's) must be given 30 calendar days within which to register as an I&AP (initial notification) and provide comments. Further, registered I&AP's must be given an opportunity to comment on reports that will be submitted to the relevant authority

As such, and in accordance with the Public Participation Guidelines produced by the relevant authority, all I&APs have 30-days within which to register and provide comment on this Scoping Report. An I&APs database will be prepared and maintained as part of the PPP.

The consultation period commences on 20 March 2023 and concludes on 21 April 2023. Thereafter all issues and concerns raised by the I&APs will be addressed in the Comments and Responses Report. This document and the Final Scoping Report, will then be submitted to the Competent Authority during April/May 2023

One PPP is being conducted for all six of the PVSEF's that comprise the Soyuz Solar PV Park Cluster 1-6 development. One regional newspaper advert will be published in the NoordKaap Bulletin on 16 March 2023. Six site notices were placed at highly visible locations across the Soyuz Solar PV Park Cluster 1-6 development footprint. Proof this is in Appendix C.

13.3 AUTHORITY CONSULTATION

The following Authorities have been consulted with on the Project as part of the Scoping Report Public Participation process:

- The Department of Forestry, Fisheries and the Environment
- Department of Mineral Resources and Energy
- Department of Water and Sanitation
- Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform
- Northern Cape Department of Economic Development and Tourism
- Northern Cape Department of Roads and Public Works
- Ngwao Boswa Kapa Bokone – Provincial Heritage Authority
- Cape Nature

- Emthanjeni Local Municipality
- Air Traffic Navigation Services
- Co-Operative Governance & Traditional Affairs
- National Energy Regulator of South Africa
- South African Civil Aviation Authority
- South African Heritage Resources Agency
- South African Radio Astronomy Observatory
- South African Weather Services
- Agri NoordKaap
- Endangered Wildlife Trust
- Birdlife South Africa
- Wildlife and Environment Society of South Africa

13.4 SUMMARY OF APPLICATION AND PUBLIC PARTICIPATION PROCESS

ITEM	DATE	COMMENT
Submission of Application Form and supporting documents to DFFE.	17 March 2023	
Initial Specialist Studies (i.e. opinions) to inform Scoping Report	November 2022 to January 2023.	
Collation of the Scoping Report (SR)	February to March 2023	
Identification of interested and affected parties	January to March 2023	Erf ownership details obtained from property owner and local authority and Windeeds
Newspaper advert published in the *Noordkaap*	06 March 2023	Regional newspaper
Review of Scoping Report and Plan of Study for EIR by registered stakeholders	20 March to 21 April 2023	
Collation of the Scoping Report for Decision	April 2023	
Submission of Scoping Report and Plan of Study (POS) for EIR to DEA	April 2023	
Approval of Scoping Report and POS for EIR	June 2023	
Collation of the Environmental Impact Report (EIR) and EMPr	TBA	
Review of EIR Report by registered stakeholders	TBA	
30-day response period allowed for	TBA	
30-day stakeholder response period ends	TBA	
Collation of the EIR Report for Decision	TBA	
Submission of final EIA Report to DFFEE	TBA	

ITEM	DATE	COMMENT
Notification of registered stakeholders of the environmental authorisation decision	TBA	

13.5 PROOF OF NOTIFICATION

A copy of the contents of the site notices, adverts and notification letters is contained in Appendix C.

13.6 LIST OF REGISTERED INTERESTED AND AFFECTED PARTIES

The Comments and Responses Report will contain the details of all registered I&AP's and will be submitted with the Final Scoping Report to the Competent Authority.

13.7 SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

All issues raised by I&APs will be placed within the Comments and Responses Report and this will be submitted to the Competent Authority for a Decision once this statutory 30-day PPP has concluded.

All I&APs will have review of the responses to their issued raised during the EIA Phase PPP. The EIA Phase PPP is a statutory 30-day PPP, which can only commence once the Competent Authority have accepted the Scoping Report for a Decision.

13.8 NEXT STEPS IN THE ENVIRONMENTAL APPLICATION PROGRAMME

Once Scoping Phase (this Phase) on the Environmental Permitting Process has been completed, the EIA Phase will follow on thereafter. During the EIA Phase the Professional Team will undertake a full Impact Assessment of the Scoping Phase Assessments undertaken to date, to refine and confirm the potential impacts, the status and magnitudes. The potential impacts of the establishment and operation of the proposed PVSEF on the physical, biological and socio-economic environment of the area will be examined in detail. All I&APs issues that were raised during the Scoping Phase will help assist to complete a transparent and credible EIA Phase.

The Environmental Impact Assessment (EIA) Phase will follow completion of the Scoping Phase (this phase). During the EIA phase, specialist studies will be conducted that will inform the impact assessment. Issues raised by I&APs and the potential impacts of the establishment and operation of the proposed water and waste management components on the physical, biological and socio-economic environment of the area will be examined in detail. In this way stakeholder issues will assist to drive the EIA process. The EIA Report for Comment will be accompanied by an Environmental Management Programme (EMPr), which will inform the Applicant of what mitigation measures are required to be put in place during the different phases of the lifecycle of the Project. This EIA Report for Comment will then be issued to all Registered Stakeholders for a further 30-day PPP. This EIA Report for Comment is anticipated to be issued to all I&APs during the third quarter of 2023.

Once the statutory 30-day PPP for the EIA Phase of the Project has completed, a Comments and Responses Reports will be compiled for this stage and this Comments and Responses will address all the issues raised during the EIA Phase PPP. The EIA Report for Decision, accompanied by the EMPr and

the Comments and Responses Report will then be submitted to the Competent Authority for a Decision.

13.9 OBJECTIVES OF THE EIA PROCESS

In accordance with the Appendix 3 Regulation 2 of GN No. R. 326 of the NEMA EIA Regulations (2014 as amended) the objective of the environmental impact assessment process 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.

14 OATH OF EAP UNDERTAKING ASSESSMENT

*In accordance with **Appendix 1 Regulation 3(r) of GN No. R. 326 of the NEMA EIA Regulations (2014, as amended**), the following information is presented in Section 16.*

***R3(r)** – An undertaking under oath of affirmation by the EAP in relation to:*

***R3(r) (i)** – The correctness of the information provided in the reports*

***R3(r) (ii)** – The inclusion of comments and inputs from stakeholders and I&APs*

***R3(r) (iii)** – The inclusion of inputs and recommendations form the specialist reports where relevant; and*

***R3(r) (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 or affected parties.*

Fabio Venturi (the appointed EAP), on behalf of Terramanzi Group (Pty) Ltd ("TMG"), the consulting firm appointed to undertake the environmental permitting process as detailed in this report, hereby declares that the EAP and the firm have no conflicts of interest related to the work of this Report. Specifically, the EAP and the firm declare that they have no personal financial interests in the property and/or activity being assessed in this report, and that they have no personal or financial connections to the relevant property owners, developers, planners, financiers or consultants of the property or activity, other than fair remuneration for professional services rendered for this Report to the Competent Authority. The EAP and the firm declare that the opinions expressed in this Report are independent and a true reflection of the professional expertise exercised

15 ASSUMPTIONS AND LIMITATIONS

*In accordance with **Appendix 1 Regulation 3(o) of GN No. R. 326 of the NEMA EIA Regulations (2014, as amended**):*

A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;

Based on the available information assessed during the Scoping Phase, it is reasonable to suggest that the following assumptions and limitations have been used throughout this Report.

- That the information provided by the Specialists, Applicant and Developer are true and correct.
- That this is a Scoping Phase Impact Assessment and that Specialists have identified potential impacts in accordance with the requirements of Appendix II to the best of their ability.

- That the preferred alternative as proposed in this Scoping Phase has been designed from a Scoping Impact Assessment and will need to be refined and further assessed during the EIA Phase of the Project.

16 PLAN OF STUDY FOR THE EIA PHASE OF THE PROJECT

16.1 INTRODUCTION

This Plan of Study for EIA complies with the requirements outlined in the EIA Regulation, 2014 (as amended). This Plan of Study refers to the second phase of the EIA process, i.e. the Environmental Impact Assessment (EIA) Phase, which is aimed at investigating the potential for, and the significance of, the environmental impacts associated with the proposed activity at the preferred site.

A comprehensive EIA is required as follow up to the Environmental Scoping Phase. In accordance with the Environmental Authorisation Application Procedure, potential environmental issues are identified during the Environmental Scoping Phase. In addition, gaps in the information available that are required to conduct the environmental impact assessment thoroughly are identified for inclusion in the terms of reference for the specialist EIA phase studies. This Plan of Study for EIA will outline the sequence of actions to be taken to complete the EIA process and submit the EIA Report to the competent authority for decision-making.

16.2 OBJECTIVES

The aim of the Plan of Study for EIA is to define the proposed approach to the environmental impact assessment. As stipulated in the EIA Regulations (2014 as amended in 2017), the Plan of Study should include the following elements:

*In accordance with **Appendix 2 Regulation 2(1)(h) of GN No. R. 326 of the NEMA EIA Regulations (2014 as amended)**, the following information is presented in this Section:*

i. A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;
ii. A description of the aspects to be assessed as part of the environmental impact assessment process
iii. Aspects to be assessed by Specialists
iv. A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists
v. A description of the proposed method of assessing duration and significance
vi. An indication of the stage at which the Competent Authority will be consulted
vii. Particulars of the public participation process that will be concluded as part of the environmental impact assessment process;
viii. A description of the tasks that will be undertaken as part of the environmental impact assessment process;
ix. Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

16.3 ALTERNATIVES TO BE CONSIDERED

The NEMA EIA Regulations (2014 as amended) require that a "*description of any feasible and reasonable alternatives identified*" must be provided. The NEMA EIA Regulations (2014 as amended) define alternatives as the following:

"Alternatives" in the context of an activity, specify different means of meeting the general purpose and requirements of the activity, which may include alternatives to:

a) The *property* on which or location where it is proposed to undertake the activity;
b) The *type* of activity to be undertaken;
c) The *design* or layout of the activity;
d) The *technology* be used in the activity; and
e) The *operational* aspects of the activity.

The "*No-Go*" alternative must also be assessed.

Based on the available information, the EAP, in conjunction with reference to various specialist opinions for the site has considered the following alternatives, which will, at the EIA Phase, be determined for further comparative assessment, only once they have passed the 'feasible and reasonable' test as detailed in the NEMA EIA Regulations (2014 as amended):

1) **Layout Alternatives** (to address any environmental impacts)
2) The "**No-Go**" consideration (this is a mandatory option)

Based on the contextual information available thus far, and considered by the EAP, there is no evidence to suggest that other alternatives should be investigated for the proposed activity.

16.4 SPECIALIST STUDIES/INPUT

Based on the initial assessment of the proposed development, the experience of the Project team (the EAP, Project Managers and Specialist), the need arises for the undertaken of the following specialist Studies as part of the Impact Assessment Phase of the Project.

All specialist study reports will be compiled in accordance with *the* NEMA EIA Regulations (2014 as amended) GNR 326 Appendix 3 published under the National Environmental Management Act, Act No. 107 of 1998 and with the applicable protocols.

16.4.1 Avifauna Specialist EIA Study

Proposed Specialist	Enviro Insight	**Expertise**
Represented by:	Luke Verburgt (PrSciNat) Samuel Laurence (PrSciNat) AE van Wyk (Cand.SciNat	PrSciNat PrSciNat CandSciNat
Objectives of study:	Enviro Insight conducted a detailed site assessment during the scoping phase of the EIA process. The EIA study will expand on the information in the Scoping Study as follows: ▪ Addressing all I&AP comments and concerns;	

	▪ Updating the scoping report with additional relevant information such as the habitat delineation from the botanical specialist study; ▪ Completing the Site Ecological Sensitivity (SEI) evaluation; ▪ Completing the Impact Assessment Ratings; ▪ Updating the proposed mitigation measures; ▪ Refining the Opportunity and Constraints mapping; ▪ Updating and refining the Conclusions & Professional Opinion.

16.4.2 Terrestrial Biodiversity Specialist EIA Study

Proposed Specialist	Scientific Terrestrial Services	**Expertise**
Represented by:	N Cloete C Steyn	PrSciNat PrSciNat
Objectives of study:	Scientific Terrestrial Services conducted a site assessment during the scoping phase of the EIA process. The EIA study will expand on the information to achieve the following specific outcomes: ▪ To identify and consider all sensitive landscapes including rocky ridges, wetlands and/or any other special features; ▪ The terrestrial ecological assessment will focus on: ▪ Conducting a SCC assessment, including potential for species to occur within the Soyuz 4 Solar PV Park ; ▪ Providing floral and faunal inventories of species that were encountered on site; ▪ Describing the spatial significance of the proposed infrastructure development with regards to surrounding natural areas; ▪ Describing floral habitats, communities and ecological state of the proposed infrastructure development as is determined on site; ▪ Identifying dominant floral and faunal species for each habitat type; ▪ Focus will be given to identifying areas of severe alien and invader encroachment and listing Category 1, 2 and 3 species in terms of GN No. 864 Alien and Invasive Species List, 2020: NEMBA; ▪ Specific focus will also be given to establishing the presence of RDL and protected ▪ fauna and flora as listed under the IUCN, the NCNCA (Schedules 2),the NFA, and the NEMBA: TOPS list of 2007); ▪ The reports produced will include a detailed impact assessment of all identified significant risks, including cumulative impacts on ecological assemblages in the region; and ▪ Recommendations on the management and mitigation measures (including opportunities and constraints) with regards to the construction and operation of the proposed activities, will be	

Proposed Specialist	Scientific Terrestrial Services	Expertise
	provided to manage and mitigate impacts on the terrestrial ecology of the area.	

16.4.3 Freshwater Ecological Impact Assessment

Proposed Specialist	Scientific Aquatic Services	Expertise
Represented by:	S van Staden P da Cruz	PrSciNat CandSciNat
Objectives of study:	Scientific Aquatic Services conducted a site assessment during the scoping phase of the EIA process. The EIA study will expand on the information to achieve the following specific outcomes: ▪ The Ecological Importance and Sensitivity (EIS) of the freshwater ecosystems in the study area will be determined according to the method described by Rountree and Kotze, (2013); ▪ The services provided by the freshwater ecosystems in the study area will be assessed according to the method of Kotze et al (2009) in which services to the ecology of the study area as well as services to the people of the area are defined; ▪ The Present Ecological State (PES) of the freshwater ecosystems in the study area will be assessed according to the resource directed measures guideline as advocated by Macfarlane et al., (2008) or DWAF (2007) as applicable; ▪ The Recommended Ecological Category (REC), Recommended Management Objective (RMO) and Best Attainable State (BAS) for all freshwater ecosystems in the study area will be assessed; ▪ All potential impacts identified in the scoping phase of the project will be assessed in detail according to the DWS Risk Assessment Matrix (2016) methodology and the impact assessment methodology provided by the EAP. ▪ All relevant and applicable mitigation measures will be refined; and; ▪ A statement regarding the acceptability of the proposed development from a freshwater context will be provided.	

16.4.4 Environmental Noise Impact Assessment

Proposed Specialist	dBAcoustics	Expertise
Represented by:	Barend van der Merwe	Expert
Objectives of study:	The aim of the Environmental Noise Impact Assessment will be to: • Determining and quantitatively defining the existing ambient sound level environment, to provide a baseline measure against which to compare the predicted cumulative noise levels potentially associated with the proposed development;	

Proposed Specialist	dBAcoustics	Expertise
	• Identifying noise legislation and/or guidelines applicable to the proposed development; • Predicting and assessing the potential increase in noise impacts of the proposed development on the surrounding sound level environment; and • Providing management and mitigation measures that may need to be implemented by to manage any potential significant negative noise impacts.	

16.4.5 Visual Impact Assessment

Proposed Specialist	Scientific Aquatic Services	Expertise
Represented by:	S van Staden S Erwee	PrSciNat
Objectives of study:	Scientific Aquatic Services conducted a visual assessment during the scoping phase of the EIA process. The EIA study will expand on the information to achieve the following specific outcomes: • To ensure the report considers the Equator Principles and International Finance Corporation (IFC) Performance Standards • To identify the main viewsheds through undertaking a viewshed analysis, based on the proposed height of infrastructure components and the Digital Elevation Model (DEM); • To establish receptor sites and identify Key Observation Points (KOPs) from which the proposed project will have a potential visual impact, if necessary; • To prepare a photographic study and conceptual visual simulation of the proposed project as the basis for the viewshed identification and analysis, if necessary; • To assess the potential visual impact of the proposed project from selected receptors sites in terms of standard procedures and guidelines • To describe mitigation measures in order to minimise any potential visual impacts.	

16.4.6 Heritage Impact Assessment

Proposed Specialist	ACO Associates cc	Expertise
Represented by:	John Gribble	Expert
Objectives of study:	ACO Associates a detailed heritage scoping report during the scoping phase of the EIA process. The EIA study will expand on that information to compile a Heritage Impact Assessment as required by SAHRA. Given the moderate palaeontological sensitivity of the development site, the HIA will need to include a desk-based palaeontological impact assessment, and possibly a field inspection due to the presence of high sensitivity sediments on the site. A comment on the HIA will be required	

Proposed Specialist	ACO Associates cc	Expertise
	from SAHRA on the archaeology and palaeontologic and from the Northern Cape heritage authority (Ngwao-Boswa Ya Kapa Bokoni) on the cultural landscape.	

16.4.7 Traffic Impact Assessment

Proposed Specialist	Innovative Transport Solutions	Expertise
Represented by:	Pieter Arangie	Expert
Objectives of study:	According to the Department of Transports document 'SA Trip Generation Rates' (1995) developments that generate over 150 vehicles per hour, in peak hours, require a full Traffic Impact Assessment. However, those developments generating less than 150 trips per hour during the peak hour require a Traffic Impact Statement. It is likely that a Traffic Impact Statement will be required for the EIA phase. The Traffic Impact Statement must include the following: ▪ Current traffic volumes on N14 and R358 ▪ Anticipated traffic volumes as a result of both the construction and operational phase of the project, including types of vehicle ▪ Assessment of the access off the N14 and R358 for safety risks ▪ Specifying the potential traffic impacts and their significance and providing mitigation measures where required for both the construction and operational phase.	

16.5 ADDITIONAL INFORMATION REQUIRED

The Scoping phase has identified that additional information is required for the following issues to assess the potential environmental impacts and to determine if additional specialist input may be required to determine mitigation measures:

- The management of discarded, damaged or used solar PV panels
- The quantities of groundwater that will be required to conduct the washing of the panels and the available groundwater supply

16.6 CONSULTATION WITH THE COMPETENT AUTHORITY

Communication will be maintained with the Competent Authority to ensure that regulatory/procedural requirements are being met and a high degree of quality is being upheld in the EIA process.

16.7 IMPACT IDENTIFICATION AND METHODOLOGY

This will include identification (Phase 1) of environmental impacts, and assessment (Phase 2) of environmental impacts. Phase 3 will involve the identification of mitigation measures to reduce environmental impacts.

Phase 1: Impact Identification

The potential environmental impacts of the proposed activity have been identified during the scoping phase. These impacts have been ascertained based on the following:

- Inspection of the site and surroundings (current environmental conditions);
- Discussions with members of the project team (the EAP, Applicant, professional team and project managers);
- Discussions with relevant authorities;
- Previous investigations in the area;
- Specialist opinions available;
- Review of spatial information including maps and development layouts;
- Issues and concerns raised during the public participation process; and
- Determining future changes to the receiving environment as a result of the proposed activity.

Phase 2: Impact Prediction and Assessment

The objective of the impact prediction and assessment phase will be to evaluate all the impacts that may arise from the undertaking of the proposed activity for the preferred site.

The assessment of impacts includes (but is not limited to):

- Identifying and assessing the potential impacts associated with the proposed activity and its alternatives;
- Predicting the nature, magnitude, extent and duration of potentially significant impacts;
- Identifying the range of mitigation measures that could be implemented to lessen the impacts of the activity
- Timing of the impact i.e. during operation and/or decommissioning;
- The extent to which the impact can be reversed or not;
- The likelihood or probability of the impact actually occurring; and
- The significance of the impact.

The methods used to predict, assess and rank the characteristics of impacts will include the following:

- Professional judgement;
- Case studies/past experience;
- Specialist studies;
- I&AP comments and concerns; and
- A weighting value for each parameter will also be used for final ranking of each impact**.**

Evaluation of the impacts will be done according to the Table 18 wherein the definitions of the impact assessment methodology are provided.

To comparatively rank the impacts, each impact will be assigned a score using the scoring system outlined in Table 19. This scoring system allows for a comparative, accountable assessment of the indicative cumulative positive or negative impacts of each aspect assessed.

Phase 3: Mitigation

Practicable mitigation measures will be provided for each of the impacts identified.

Mitigation measures proposed by any specialists would be taken into consideration in order to avoid or reduce potential negative impacts.

16.8 REPORTING

An Environmental Impact Assessment Report (EIAR) and Environmental Management Programme (EMPr) will be prepared in terms of the NEMA EIA Regulations (2014 as amended). These reports and supporting documentation be submitted to interested and affected parties for comment.

16.9 PUBLIC AND STAKEHOLDER ENGAGEMENT

Public participation during the EIA Phase will revolve around a review of the findings of the EIA presented in the Draft Environmental Impact Assessment Report (DEIAR) and the Draft EMPr. These reports will be made available for review and comment by I&APs for the mandatory 30 calendar day public participation period.

All issues raised during the stakeholder review and comment period on the DEIAR, its supporting reports and the Draft EMPr will be incorporated into the Final EIA Report (FEIAR) and EMPr to be submitted to the respective decision-making authorities.

16.10 EIA FOR DECISION

On completion of the Plan of Study, the Final EIAR and EMPr will be submitted to the Competent Authority for deliberation and decision.

17 PROJECT OVERVIEW AND ENVIRONMENTAL IMPACT STATEMENT

*In accordance with **Appendix 1 Regulation 3(l) of GN No. R. 326 of the NEMA EIA Regulations (2017 as amended)**:*

An environmental impact statement which contains:

***3(l) i** – A summary of the key findings of the environmental impact assessment;*

***3(l) ii** – A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and*

***3(l) iii** - A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.*

This preliminary Environmental Impact Statement provides an overview of the findings of the Scoping Phase .

Soyuz 4 Solar PV Park (Pty) Ltd proposes the development of the Soyuz 4 Solar PV Park and associated infrastructure ("the Project"), near Britstown, Northern Cape Province. The Project will be located on Portion 5 of Farm 127. The Photo Voltaic Solar Energy Facility (PVSEF) will have a generating capacity of up to 300MW and Battery Energy Storage Systems (BESS) of 1200MWh. Bi-facial, single axis trackers will be utilised for the PV panels. An on-site substation with a capacity of 300MVA, will enable the connection of a 132kV Overhead Powerline. The final interconnection solution will be dependent on the requirements of Eskom, which are still to be defined. The purpose of the facility is to generate clean electricity from a renewable energy source (i.e., solar radiation) to contribute to the national energy grid and/or any private off takers.

Based on consideration of the information contained in this Draft Environmental Scoping Report and the preliminary impact assessment undertaken with specialist input, the following is relevant:

The proposed site is environmentally and socially suitable for the development and operation of the Soyuz 4 Solar PV Park.

The proposed development and operation of the Soyuz 4 Solar PV Park is not expected to have any significant negative social or environmental impacts on the receiving environment that cannot be avoided or suitably mitigated.

The environmental scoping phase has not identified any social or environmental "fatal flaws" that would render the proposed development unsuitable.

The following key **negative** social and environmental impacts have been identified:

- Loss of terrestrial and aquatic biodiversity due to the potential for the development to encroach physically into these sensitive environments.
- Impact on the mating behaviours (lekking) of a Species of Conservation Concern (Ludwig's Bustard) due the potential location of the solar PV park in areas where these activities could occur.
- Negative social impacts on family life due to the potential ingress of migrant workers.

The following key **positive** social and environmental impacts have been identified:

- Creation of local employment and business opportunities
- Economic and technical support to the local agricultural community
- Positive contribution towards the South African renewable energy goals
- Contribution to reduction of greenhouse gas at a national and global scale
- Improved local and regional energy supply security

The Environmental Scoping has identified that additional specialist input is required to confirm the significance of the potential impacts that may be associated with the development of the Soyuz 4 Solar PV Park and to guide the layout of the development to avoid significant negative impacts to terrestrial

and aquatic ecosystems and biodiversity. The following aspects require additional specialist input and reviewed impact assessment and input as part of the EIA phase:

- Avifauna
- Terrestrial biodiversity
- Freshwater ecology
- Environmental noise
- Visual impact
- Heritage impact
- Traffic

The need and desirability assessment has confirmed the following:

- **National Need and Desirability:** The development of Soyuz 4 Solar PV Park in South Africa is a desirable and necessary strategy for meeting the energy needs of the country. This development can enhance energy security, contribute to the electricity supply, mitigate climate change, support economic development, improve energy affordability, promote environmental sustainability, and support social development.
- **Regional Need and Desirability**: the development of the Soyuz 4 Solar PV Park in the Northern Cape province of South Africa is a desirable and necessary strategy for meeting the energy needs of the region. A PVSEF can enhance the electricity supply, contribute to economic development, improve energy affordability, promote environmental sustainability, support social development, contribute to meeting national renewable energy targets, and take advantage of the abundant solar resources available in the region.
- **Local Need and Desirability:** The proposed Soyuz 4 Solar PV Park is highly desirable due to its unique site-specific benefits. The area offers ample open space that is suitable for solar facility development, along with a amply high solar resource to generate renewable energy. The proposed facility is earmarked for an area where environmental sensitivities to such a development are low, ensuring that it is a responsible and sustainable project that will have nominal negative impacts on the surrounding environment but significantly contribute to socio-economic development by locally and regionally. The facility will create employment opportunities for the local community, providing a much-needed boost to the local economy. In addition, the skills development that will be provided to employees and contractors involved in the construction and operation of the facility will have a lasting impact on the community.

In conclusion, the proposed solar PV facility near Britstown is highly desirable due to its many benefits, including renewable energy generation, employment opportunities, skills development, and responsible environmental stewardship.

The EAP therefore **recommends that this Environmental Scoping Report and the Plan of Study for Environmental Impact Assessment phase be approved** and that the application for environmental authorisation advance into the environmental impact assessment phase.