SCOPING REPORT

Final – 30 June 2023

THE PROPOSED ORIBI SOLAR POWER PLANT NEAR PIENAARSRIVER, LIMPOPO PROVINCE

ENVIRONAMICS

PROJECT DETAIL

DFFE Reference No.	:	14/12/16/3/3/2/2355
Project Title	:	Proposed Oribi Solar Power Plant near Pienaarsriver, Limpopo Province
Authors	:	Mrs. Carli van Niekerk Mr. Herman Alberts
Reviewed	:	Ms. Christia van Dyk
Client	:	Oribi Solar Power Plant (RF) (Pty) Ltd
Report Status	:	Final Scoping Report
Submission date	:	29 June 2023

When used as a reference this report should be cited as: Environamics (2023) Final Scoping Report: Proposed Oribi Solar Power Plant near Pienaarsriver, Limpopo Province.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

PLATES

APPENDICES

Appendix A: EAP declaration & Curriculum Vitae

Appendix B: Screening report

Appendix C: Public Participation

- Appendix C1: Press advertisement
- Appendix C2: On site notice
- Appendix C3: List of I&APs
- Appendix C4: Proof of correspondence
- Appendix C5: Written comments
- Appendix C6: Comments and Responses Report

Appendix D: Site Verification Report

Appendix E: Specialist Reports

- Appendix E1: Terrestrial Ecology Baseline and Impact Assessment
- Appendix E2: Avifaunal Scoping Assessment
- Appendix E3: Wetland Baseline and Risk Assessment
- Appendix E4: Soil and Agricultural Potential Assessment
- Appendix E5: Heritage and Palaeontological Impact Assessment
- Appendix E6: Social Impact Assessment
- Appendix E7: Visual Impact Assessment
- Appendix E8: Traffic Impact Assessment

Appendix F: Additional Information

GLOSSARY OF TERMS AND ACRONYMS

BA	Basic Assessment
BAR	Basic Assessment Report
CEA	Cumulative Effects Assessment
DFFE	Department of Forestry, Fisheries and the Environment
DM	District Municipality
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPFI	Equator Principles Financial Institutions
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
GNR	Government Notice Regulation
I&AP	Interested and affected party
IAP	Invasive Alien Plant
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
kV	Kilo Volt
LM	Local Municipality
Mitigate	Activities designed to compensate for unavoidable environmental damage.
MW	Megawatt
NEMA	National Environmental Management Act No. 107 of 1998

NERSA	National Energy Regulator of South Africa
NWA	National Water Act No. 36 of 1998
PAOI	Project area of influence
POSA	Plants of South Africa
PPP	Public Participation Process
PV	Photovoltaic
REIPPP	Renewable Energy IPP Procurement Process
SAHRA	South African Heritage Resources Agency
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SPP	Solar Power Plant
VU	Vegetation Unit

CONTEXT FOR THE DEVELOPMENT

According to Eskom, the demand for electricity in South Africa has been growing at approximately 3% per annum. This growing demand, fueled by increasing economic growth and social development, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmentally responsible development, the impacts of climate change and the need for sustainable development. The use of renewable energy technologies, as one of a mix of technologies needed to meet future energy consumption requirements is being investigated as part of the national Department of Mineral Resources and Energy's (DMRE) (previously referred to as the Department of Energy) long-term strategic planning and research process.

The primary rationale for the proposed solar photovoltaic (PV) facility is to add new generation capacity from renewable energy to the national electricity mix and to aid in achieving the goal of 42% share of all new installed generating capacity being derived from renewable energy forms, as targeted by Department of Mineral Resources and Energy (DMRE) (Integrated Resource Plan Update 2010-2030). The IRP also identifies the preferred generation technologies required to meet the expected demand growth up to 2030 and incorporates government objectives including affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversified electricity generation sources and localisation and regional development. In terms of the Integrated Resource Plan Update (2019 IRP Update, 2010-2030), over the short term (of the next two or three years), clear guidelines arose; namely to continue with the current renewable bid programme with additional annual rounds of 1000 MW PV, with approximately 8.4 GW of the renewable energy capacity planned to be installed from PV technologies over the next twenty years.

The proposed project is intended to form part of the DMREs Renewable Energy Independent Power Producer Procurement (REIPPP) Programme or any other programmes/opportunities to generate power in South Africa. The REIPPP Programme aims to secure 14 725 Megawatts (MW) of new generation capacity from renewable energy sources, while simultaneously diversifying South Africa's electricity mix. According to the 2021 State of the Nation Address, Government will soon be initiating the procurement of an additional 11 800 MW of power from renewable energy, natural gas, battery storage and coal in line with the Integrated Resource Plan 2019 and fulfilling their commitments under the United Nations Framework Convention on Climate Change and its Paris Agreement which include the reduction of greenhouse gas emissions. Eskom, our largest greenhouse gas emitter, has committed in principle to net zero emission by 2050 and to increase its renewable capacity.

In response to the above, Oribi Solar Power Plant (RF) (Pty) Ltd is proposing the development of a photovoltaic solar facility and associated infrastructure for the purpose of commercial electricity generation on the farm Ruimte No. 720, situated within the Bela-Bela Local Municipality area of jurisdiction (refer to Figure A for the locality map). The project entails the generation of up to 150

MW electrical power through photovoltaic (PV) technology. The total development footprint of the project will be approximately 365 hectares (including supporting infrastructure) within the 500 hectares identified and assessed as part of the Environmental Impact Assessment (EIA) process. From a regional site selection perspective, this region is preferred for solar energy development due to its global horizontal irradiation value of around 2118 kWh/m^2.

EXECUTIVE SUMMARY

Like many other small and developing municipalities in the country, the Bela-Bela Local Municipality faces several challenges in addressing the needs of sustainable growth and improved quality of life. The Bela-Bela Local Municipality Integrated Development Plan (2022) states that it's the mission of the local municipality to ensure effective and efficient services delivery; stakeholders driven economic development and growth; sustainable job creation opportunities of communities; and a safe, healthy and prosperous environment.

Oribi Solar Power Plant (RF) (Pty) Ltd intends to develop a 150 MW photovoltaic solar facility and associated infrastructure on the farm Ruimte No. 720 situated within the Bela-Bela Local Municipality area of jurisdiction. The town of Pienaarsriver is located approximately 1km east of the proposed development (refer to Figure A and B for the locality and regional map). The total footprint of the project will approximately be 365 hectares (including supporting infrastructure on site). The site was identified as being highly desirable due to its suitable climatic conditions, topography (i.e., in terms of slope), environmental conditions (i.e., agricultural potential, ecological sensitivity and archaeology), proximity to the D262 district road (i.e., to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase).

In terms of the National Environmental Management Act (Act 107 of 1998), with specific reference to Sections 24 and 24D, as read with GNR 324-327, as amended (2017), Environmental Authorisation is required for the Oribi Solar Power Plant (SPP). The following listed activities have been identified with special reference to the proposed development and are listed in the EIA Regulations (as amended):

- Activity 11 (i) (GN.R. 327): *"The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."*
- *Activity 24 (ii) (GN.R 327): "The development of a road (ii) with reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters."*
- Activity 28 (ii) (GN.R. 327): *"Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare."*
- Activity 56 (ii) (GN.R 327): "*The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (ii) where no reserve exists, where the existing road is wider than 8 metres…"*
- Activity 1 (GN.R. 325): *"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more..."*

- Activity 15 (GN.R. 325): *"The clearance of an area of 20 hectares or more of indigenous vegetation..."*

- Activity 4 (e)(i)(bb)(ee) & (hh) (GN.R. 324): *"The development of a road wider than 4 metres with a reserve less than 13,5 metres within (e) the Limpopo province, (i) outside urban areas, (bb) National Protected Area Expansion Strategy Focus areas; (ee) within critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (hh) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas."*

- Activity 10 (e)(i) (GN.R 324): *"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 (e) in the Limpopo province (i) all areas.*

- Activity 12 (e)(ii) (GN.R 324): *"The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation in (e) Limpopo (ii) within critical biodiversity areas identified in bioregional plans".*

- Activity 14(ii)(a)(c)(e)(i)(ff)&(hh) (GN.R 324): *"The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs (a) within a watercourse or (c) within 32 metres of a watercourse, measured from the edge of a watercourse, (e) within the Limpopo province, (i) outside urban areas within (ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans and (hh) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA".*

- Activity 18 (e)(i) (bb)(ee)(gg) & (hh) (GN.R 324): *"The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre (e) Limpopo (i) outside urban areas, (bb) National Protected Area Expansion Strategy Focus areas; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (hh) areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland."*

Activities required for the development of the solar facility which are listed under Listing Notice 1, 2 and 3 (GNR 327, 325 and 324) implies that the development could potentially have a significant impact on the environment that will require mitigation. Subsequently a thorough assessment process is required as described in Regulations 21-24 of the EIA Regulations in order to obtain Environmental Authorisation (EA). Environamics has been appointed as the independent consultant to undertake the EIA on behalf of Oribi Solar PV (RF) (Pty) Ltd.

Regulation 21 of the EIA Regulations requires that a scoping report must contain the information set out in Appendix 2 of the Regulations or comply with a protocol or minimum information requirements relevant to the application as identified and gazetted by the Minister in a government notice. Appendix 2 of GNR326 requires that information which is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process undertaken be set out in the scoping report.

The potentially sensitive areas which have been identified through the environmental scoping study are detailed in the chapters to follow. The scoping phase provides a high-level overview of the sensitivity on the Oribi SPP project site. The detail is based on the desktop review of available baseline information for the project site, as well as the sensitivity data received from specialist studies undertaken during the scoping phase. During the scoping phase, the affected area was investigated in sufficient detail in order to provide reliable insight into the potential for constraining factors on the site. The sensitivity map(s) must be used as a tool by the developer to avoid any areas flagged to be of higher risk or sensitivity which must in turn inform the development layout which can then be further investigated during the EIA Phase in order to develop an environmentally suitable, reasonable and practical facility layout for the Oribi SPP.

Based on the high-level assessments undertaken to inform this scoping process, it has been determined that the proposed development will have a net positive impact for the area and will subsequently ensure the optimal utilisation of resources and land. All negative environmental impacts can be effectively mitigated through the recommended mitigation measures and no residual negative impacts are foreseen. The potentially most significant environmental impacts associated with the development, as identified in this scoping phase, are briefly summarised below. It must be noted that the Environmental Impact Assessment (EIA) phase of the project will consider the impacts on a more detailed level and provide feedback on the facility layout for the proposed project.

<u>Predicted impacts during the construction phase:</u>

During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of 12-18 months. The potentially most significant impacts relate to impacts on fauna and flora, direct disturbance / degradation / loss to wetland soils or vegetation, increased erosion and sedimentation, visual impacts, impact on paleontology, and socio-economic impacts such as the creation of direct and indirect employment opportunities, economic multiplier effects from the use of local goods and services, potential loss in productive farmland, influx of jobseekers and change in population in the study area, temporary increase in safety and security concerns associated with the influx of people, temporary increase in traffic disruptions and movement patterns, nuisance impact (noise and dust), increased risk of potential veld fires, and impacts on the sense of place.

Impacts during the operational phase:

During the operational phase the site will serve as a solar PV energy facility and the potential impacts will take place over a period of 20 – 25 years. The negative impacts are generally associated with impacts on fauna and flora, potential for increased stormwater runoff leading to Increased erosion and sedimentation, potential for increased contaminants entering the wetland systems, visual impacts, loss of Land Capability, and soil erosion and compaction effects. The operational phase will have a direct positive impact through the creation of employment opportunities and skills development, development of non-polluting, renewable energy infrastructure and contribution to economic development and social upliftment.

Impacts during the decommissioning phase:

The negative impacts generally associated with the decommissioning phase include: habitat destruction caused by clearance of vegetation and the loss of permanent employment. However, skilled staff will be eminently employable and a number of temporary jobs will also be created in the process. It is not expected that the facility will be decommissioned, but rather that the technology used will be upgraded.

Cumulative impacts:

Cumulative impacts could arise as other similar projects are constructed in the area. According to the Department of Forestry, Fisheries and Environment (DFFE) database only one similar development has been proposed in relatively close proximity to the proposed activity.

The potential for cumulative impacts is therefore limited but may still exist. The Final scoping report includes an assessment of the potential cumulative impacts associated with the proposed development. Potential cumulative impacts with a significance rating of negative medium during the construction phase relate to habitat destruction and fragmentation, displacement of priority avian species from important habitats, loss of important avian habitats, impacts of employment opportunities, business opportunities and skills development and impact associated with large-scale in-migration of people. Cumulative impacts during the operational phase relate to habitat destruction and fragmentation and visual intrusion. The cumulative effect of the generation of waste was identified as being potentially significant during the decommissioning phase.

Regulation 23 of the EIA Regulations determine that an EIA report be prepared and submitted for the proposed activity after the competent authority approves the final scoping report. The EIA report will evaluate and rate each identified impact and identify mitigation measures that may be required. The EIA report will contain information that is necessary for the competent authority to consider the application for Environmental Authorisation and to reach a decision contemplated in Regulation 24 of the EIA Regulations.

1 INTRODUCTION

This section aims to introduce the scoping report and specifically to address the following requirements of the regulations:

Appendix 2. (2) A scoping report (...) must include- (a) details of:
(i) the EAP who prepared the report; and
(ii) the expertise of the EAP, including a curriculum vitae.

1.1 LEGAL MANDATE AND PURPOSE OF THE REPORT

The National Environmental Management Act identifies listed activities (in terms of Section 24) which are likely to have an impact on the environment. These activities cannot commence without obtaining an EA from the relevant competent authority. Sufficient information is required by the competent authority to make an informed decision and the project is therefore subject to an Environmental Assessment Process, which can be either a Basic Assessment Process or a Scoping and Environmental Impact Assessment Process.

The Listing Notices 1 and 2 (GNR 327 and 325) outline the activities that may be triggered and therefore require EA. This implies that the development is considered as potentially having a significant impact on the environment. Subsequently a 'thorough S&EIR assessment process' is required as described in Regulations 21-24. A detailed description of the listed activities that are triggered are included in chapter 2 to follow. According to Appendix 2 of Regulation 326 the objective of the scoping process is to, through a consultative process:

- Identify the relevant policies and legislation relevant to the activity;
- Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;
- 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 geographical, physical, biological, social, economic, and cultural aspects of the environment;
- Identify the key issues to be addressed in the assessment phase;
- Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be

undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and

- Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

This Final scoping report will be submitted to the DFFE for review and comment. According to Regulation 326 all registered I&APs and relevant state departments (including Organs of State) must be allowed the opportunity to review and provide comment on the Final Scoping Report. The Final Scoping Report will be made available to I&APs and all relevant State Departments. They will be requested to provide written comments on the report within 30 days of receiving it. All issues to be identified and comments received during the review period will be documented and compiled into a Comments and Response Report to be included as part of this Final Scoping Report. Where comments have been received prior to the release of the Final Scoping Report for the 30-day review and comment period, these comments have been included in Appendix C4 and C5 and has also been included and responded to in the Comments and Responses Report (Appendix C6).

1.2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Environamics was appointed by the applicant as the independent EAP to conduct the EIA and prepare all required reports. All correspondence to the EAP can be directed to:

Contact person:	Carli van Niekerk
EAPASA Registration:	2019/1742
Postal Address:	14 Kingfisher Street, Tuscany Ridge Estate, Potchefstroom, 2531
Telephone:	082 220 8651 (Cell)
Electronic Mail:	carli@environamics.co.za

And/Or

Contact person:	Mr. Herman (Attie) Alberts
EAPASA Registration:	2019/1328
Postal Address:	14 Kingfisher Street, Tuscany Ridge Estate, Potchefstroom, 2531
Telephone:	063 685 2093 (Cell)
Electronic Mail:	herman@environamics.co.za

Regulation 13(1)(a) and (b) determines that an independent and suitably qualified and experienced EAP should conduct the S&EIR process. In terms of the independent status of the EAP a declaration is attached as Appendix A to this report. The expertise of the EAP responsible for conducting the S&EIR is also summarised in the curriculum vitae included as part of Appendix A.

1.3 DETAILS OF SPECIALISTS

Table 1.1 provides information on the specialists that have been appointed as part of the EIA process. Regulation 13(1)(a) and (b) determines that an independent and suitably qualified, experienced, and independent specialist should conduct the specialist study, in the event where the specialist is not independent, a specialist should be appointed to externally review the work of the specialist as contemplated in sub regulation (2), must comply with sub regulation 1. In terms of the independent status of the specialists, their declarations are attached as Appendix E to this report. The expertise of the specialists is also summarised in their respective reports.

Table 1.1: Details of specialists

Study	Prepared by	Contact Person	Postal Address	Tel	e-mail
Terrestrial Ecology Baseline and Impact Assessment	The Biodiversity Company	Andrew Husted	-	Cell: 081 319 1225	info@thebiodiversitycompany.com
Avifaunal Scoping Assessment					
Wetland Baseline and Risk Assessment					
Soil and Agricultural Potential Assessment					
Heritage Impact Assessment	CTS Heritage	Jenna Lavin	-	Cell: 0828249308	jenna.lavin@ctsheritage.com
Paleontological Study					
Social Impact Assessment	Donaway Environmental Consultants	Johan Botha	30 Fouche Street Steynsrus 9515	Cell: 082 493 5166 Tel: 082 316 7749	johan@donnawayl.co.za
Visual Impact Assessment					
Traffic Assessment Study	BVi Consulting Engineers	Liza Botha	Edison Square, Century City 7441	Cell: 060 557 7467	lizab@bviwc.co.za

1.4 STATUS OF THE EIA PROCESS

The Scoping and Environmental Impact Reporting (S&EIR) process is conducted strictly in accordance with the stipulations set out in Regulations 21-24 of Regulation No. 326. Table 1.3 provides a summary of the EIA process and future steps to be taken. It can be confirmed that to date:

- A pre-application meeting request was submitted to DFFE on 19 May 2023 and it was indicated that a pre-application meeting is not required.
- A newspaper advertisement was placed in the The Post on 10 February 2023, informing the public of the EIA process and for the public to register as I&APs.
- A site visit was conducted by the EAP on 6 February 2023.
- Site notices were erected on site on 6 February 2023 informing the public of the commencement of the EIA process.
- The Background Information Document (BID) was circulated to all I&APs and surrounding landowners on 23 February 2023.
- An application form and the Final Scoping Report will be submitted to DFFE on 22 May 2023.
- The Final Scoping Report will be made available for a 30-day review and comment period from May 2023 to June 2023.

It is envisaged that the Final Scoping Report will be submitted to the Department in June 2023 and that the Final Scoping Report will be accepted by the Department in August 2023. The EIA process should be completed within approximately nine months of submission of the Final Scoping Report, i.e. by February 2024 (see Table 1.2).

Table 1.2: Estimated timeframe for completion of the 'scoping and EIA process'

Activity	Prescribed timeframe	Timeframe
Site visits	-	6 February 2023
Public participation (BID)	30 Days	March – April 2023
Conduct specialist studies	2 Months	Feb. – Apr. 2023
Submit application form and DSR	-	May 2023
Public participation (DSR)	30	May – June 2023

Submit FSR	44	June 2023
Approval of Final Scoping Report	43 Days	August 2023
Submit Final EIR & EMPr	106 Days	August 2023
Public participation (DEIR)	30 Days	Aug. – Sept. 2023
Submission of FEIR & EMPr	-	September 2023
Decision	107 Days	February 2024
Public participation (decision) & submission of appeals	20 Days	Feb. – Mar. 2024

1.5 SPECIALIST STUDIES IDENTIFIED IN THE DFFE SCREENING TOOL REPORT

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulations and 21 – 24 of the EIA Regulations. The requirement for the submission of a Screening Report for the Oribi SPP is applicable as it triggers Regulation 21 of the EIA Regulations, 2014 (as amended). The Screening Report has been appended to the Application for EA was submitted to the DFFE on 22 May 2023.

The table included below provides an indication of the specialist studies identified by the DFFE Screening Tool Report (Appendix B), an indication of whether the studies were undertaken or not and a motivation or confirmation of the studies being included or not.

Table 1.3: Specialist studies identified by the DFFE Screening Tool Report (Appendix B)

Study identified in the DFFE Screening Tool and sensitivity	Study included?	Appendix
Agricultural Impact Assessment Sensitivity: Very high	Yes	A Soil and Agriculture Potential Assessment is included in Appendix E4. The high to very high sensitivity is disputed by the report and an overall sensitivity rating of low is given.
Animal Species Assessment Sensitivity: High	Yes	The Terrestrial Ecology Baseline and Impact Assessment (refer to

		Appendix E1) includes the relevant Animal Species Assessment. This assessment has been undertaken in terms of the Protocols of GNR320 (refer to the content of the report).
Aquatic Biodiversity Impact Assessment Sensitivity: Low	Yes	A Wetland Baseline and Risk Assessment (refer to Appendix E3) has been undertaken in terms of the Protocols of GNR320 – refer to the content of the report.
Archaeological and Cultural Heritage Impact Assessment Sensitivity: Low	Yes	A Heritage Impact Assessment is included in Appendix E5.
Avian Impact Assessment Sensitivity: High	Yes	An Avifauna Scoping Assessment (refer to Appendix E2) has been undertaken in terms of the Protocols of GNR320 – refer to the content of the report.
Civil Aviation Assessment Sensitivity: Low	No	The identification of the site as low sensitivity considering civil aviation is agreed to by the EAP. This is based on the current land use of the site being used for agricultural purposes. The Civil Aviation Authority has been consulted regarding the development of the project since the commencement of the S&EIR Process. No specific negative impacts or issues have been raised to date by the CAA regarding the project. The project is also not located within an area considered to be of a high sensitivity. No assessment has been included.

Defence Theme Sensitivity: Low	No	The identification of the site as low sensitivity is agreed to by the EAP. The affected property is confirmed to be used for agricultural purposes and therefore the development will not have any impact on defence installations. The sensitivity for the entire extent of the site is low and therefore no assessment has been included. The South African National Defence Force has been consulted regarding the development of the project since the commencement of the S&EIR Process. No specific negative impacts or issues have been raised to date regarding the project. The project is also not located within an area considered to be of a high sensitivity.
Landscape / Visual Impact Assessment Sensitivity: Very High	Yes	A Visual Impact Assessment is included in Appendix E8.
Palaeontological Impact Assessment Sensitivity: Very High	Yes	A Palaeontological Impact Assessment is included in Appendix E6.
Plant species Assessment Sensitivity: Medium	Yes	The Terrestrial Ecology Baseline and Impact Assessment (refer to Appendix E1) includes the relevant Plant Species Assessment. This assessment has been undertaken in terms of the Protocols of GNR320 – refer to the content of the report.
RFI Assessment	No	The RFI theme sensitivity is low for the entire extent of the project.

Sensitivity: Low		The South African Radio Astronomy Observatory (SARAO) has been consulted regarding the development of the project since the commencement of the S&EIR Process. No specific negative impacts or issues have been raised to date by the SARAO regarding the project.
Terrestrial Biodiversity Impact Assessment Sensitivity: Very High	Yes	A Terrestrial Ecology Baseline and Impact Assessment (refer to Appendix E1) has been undertaken in terms of the Protocols of GNR320 – refer to the content of the report.
Geotechnical Assessment Sensitivity: Not indicated	No	The Geotechnical Assessment will be conducted before construction begins as part of the micro-siting of the facility layout. The consideration of geotechnical aspects is considered to be of a technical concern rather than an environmental concern.

1.6 STRUCTURE OF THE REPORT

This report is structured in accordance with the prescribed contents stipulated in Appendix 2 of Regulation No.326. It consists of eight sections demonstrating compliance to the specifications of the regulations as illustrated in Table 1.4.

Table 1.4: Structure of the report

Requirements for the contents of a scoping report as specified in the Regulations		Section in report
(a)	details of -	1
	(i) the EAP who prepared the report; and	
	ii) the expertise of the EAP, including a curriculum vitae.	
(b)	the location of the activity, including-	2
	(i) the 21-digit Surveyor General code of each cadastral land parcel;	
	(ii) where available, the physical address and farm name;	
	(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	
(c)	a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is-	
	(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	
	(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	
(d)	a description of the scope of the proposed activity, including-	
	(i) all listed and specified activities triggered;	
	(ii) a description of the activities to be undertaken, including associated structures and infrastructure.	
(e)	A description of the policy and legislative context within which the development is 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;	3
(f)	a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	4

(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 –	5
	(i) details of all the alternatives considered;	
	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	
	(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	
	(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	
	(ix) the outcome of the site selection matrix;	
	(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	
	(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	
(g)	(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;	6
	(vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	
	(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	
	(viii) the possible mitigation measures that could be applied and level of residual risk;	

(i)	a plan of study for undertaking the environmental impact assessment process to be undertaken, including-	8
	(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 EIA process;	
	(iii) aspects to be assessed by specialists;	
	(iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;	
	(v) a description of the proposed method of assessing duration and significance;	
	(vi) an indication of the stages at which the competent authority will be consulted;	
	(vii) particulars of the public participation process that will be conducted during the EIA process; and	
	(viii) a description of the tasks that will be undertaken as part of the EIA 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.	
(j)	an undertaking under oath or affirmation by the EAP in relation to-	Appendix A to the report
	(i) the correctness of the information provided in the report;	
	(ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and	
	(iii) any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by I&APs;	
(k)	an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and I&APs on the plan of study for undertaking the EIA;	
(l)	where applicable, any specific information required by the CA; and	N/A
(m)	any other matter required in terms of section 24(4)(a) and (b) of the Act.	N/A

2 ACTIVITY DESCRIPTION

This section aims to address the following requirements of the regulations:

Appendix 2. (2) A scoping report (...) must include-

(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;

(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;

(c) a plan which locates the proposed activity 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

(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;

(d) a description of the scope of the proposed activity, including-

(i) all listed and specified activities triggered;

(ii) a description of the activities to be undertaken, including associated structures and infrastructure.

2.1 THE LOCATION OF THE ACTIVITY AND PROPERTY DESCRIPTION

The activities entail the development of a photovoltaic solar facility and associated infrastructure on the namely the farm Ruimte No. 720 situated within the Bela-Bela Local Municipality area of jurisdiction. The proposed development is located in the Limpopo Province in the most northern part of South-Africa (refer to Figure B for the regional map). The town of Pienaarsriver is located approximately 1km east of the proposed development. (refer to Figure A for the locality map).

The project entails the generation of up to 150MW electrical power through the installation and operation of photovoltaic (PV) panels. An area of 500 ha has been assessed as part of this Scoping Report (hereafter referred to as the "EIA Footprint"). The full extent of the development area has been considered during scoping with the aim of confirming the suitability from an environmental and social perspective. A development footprint will be defined based on the outcomes of the scoping phase and will be further assessed in the EIA phase. It is envisioned that the development footprint for Oribi SPP will be ~365 ha in extent. The property on which the facility is to be constructed will be leased by Oribi Solar Power Plant (RF) (Pty) Ltd from the property owner for the life span of the project (minimum of 20 years).

Energy generated by the facility will be evacuated into the national grid via the proposed loop-in loop-out connection to the existing Pelly/SAR Pienaarsrivier 132 kV Overhead Line. The connection power line will be constructed within the limits of the grid connection corridor (refer to Table 2.1 for the general site information).

Table 2.1: General site information

Description of affected farm portion	The Farm Ruimte No. 720
Province	Limpopo
District Municipality	Waterberg District Municipality
Local Municipality	Bela-Bela Local Municipality
Ward numbers	Ward 4
Closest towns	Pienaarsriver is located approximately 1km east of the proposed development.
21 Digit Surveyor General codes	<u>Solar Power Plant:</u> Farm Ruimte No. 720 T0JR00000000072000000 <u>Grid Connection:</u> Farm Ruimte No. 720 T0JR00000000072000000
Photographs of the site	Included in Plates as an appendix to the Report
Type of technology	Photovoltaic solar facility
Structure Height	• Panels ~6m • Buildings ~ 6m • Power line ~ 32m; and • Battery storage facility ~8m height
Battery storage	Within a 4-hectare area within the development footprint
Surface area to be covered (Development footprint)	Approximately 365 ha
Structure orientation	Monofacial or Bifacial PV panels will be utilised. The panels will either be fixed to a single-axis and/or double

	horizontal tracking structure where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture the most sun.
Laydown area dimensions (area assessed as part of the EIA)	Permanent Laydown Area: 365 Hectares Construction Laydown Area: ~5 ha
Generation capacity	Up to 150MW
Expected production	N/A - this will be dependent on the chosen technology.

The project area exclusively consists of land used for agriculture (grazing), but wetland features (depressions) are located on the development footprint, as well as a drainage line.

2.2 ACTIVITY DESCRIPTION

The proposed development will trigger the following activities:

Table 2.2: Listed activities

Relevant notice:	**Activity No (s)**	**Description of each listed activity as per project description**:
GNR. 327 (as amended in 2017)	Activity 11(i)	• *"The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts".* • Activity 11(i) is triggered since the proposed photovoltaic solar facility includes an on-site HV/MV substation and switching station with a capacity of up to 132kV. It is expected that generation from the facility will be evacuated into the national grid via the proposed loop-in loop-out connection to the existing Pelly/SAR Pienaarsrivier 132 kV Overhead Line.
GNR. 327 (as amended in 2017)	Activity 24(ii)	• *"The development of a road (ii) with reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters".*

		• Activity 24(ii) is triggered as the proposed main access road to Oribi SPP will be approximately 10 meters wide, and with the inclusion of side drains and gavel embankments, will exceed the threshold of this activity.
GNR. 327 (as amended in 2017)	Activity 28(ii)	• *"Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare".* • Activity 28(ii) is triggered as the total area to be developed for the PV facility and associated infrastructure is greater than 1ha and occurs outside an urban area in an area currently zoned for agriculture. The property will be re-zoned to "special" use.
GNR. 327 (as amended in 2017)	Activity 56 (ii):	• *"The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (ii) where no reserve exists, where the existing road is wider than 8 metres…"* • Activity 56(ii) is triggered as the existing access to the affected property does not have a reserve and will need to be widened by more than 6 metres.
GNR. 325 (as amended in 2017)	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".* • Activity 1 is triggered since the proposed photovoltaic solar facility will generate up to 150 megawatts electricity through the use of a renewable resource.
GNR. 325 (as amended in 2017)	Activity 15	• *"The clearance of an area of 20 hectares or more of indigenous vegetation."* • The project area overlaps with the Springbokvlakte Thornveld vegetation type. According to Mucina and Rutherford (2006), the Springbokvlakte Thornveld vegetation type is classified as Endangered. Activity 15

		is triggered since portions of the site has not been lawfully disturbed during the preceding ten years; therefore, more than 20 hectares of indigenous vegetation will be removed. The development footprint of the solar PV facility will be approximately 365ha in extent.
GNR. 324 (as amended in 2017)	Activity 4 (e)(i)(bb)(ee) &(hh)	• *"The development of a road wider than 4 metres with a reserve less than 13,5 metres within (e) the Limpopo province, (i) outside urban areas, (bb) National Protected Area Expansion Strategy Focus areas; (ee) within critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (hh) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas."* • Activity 4 (e)(i)(bb)(ee) & (hh) is triggered as internal and perimeter access roads with a width of between 6 and 12 meters will be constructed and the project area overlaps with Priority focus areas National Protected Areas Expansion Strategy (NPAES), a section of the development footprint is located within a CBA 1 area, and the project area is located within 5 km of a number of protected areas.
GNR. 325 (as amended in 2017)	Activity 10 (e)(i) (GN.R 324)	• *"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 (e) in the Limpopo province (i) all areas.* • Activity 10 (e)(i) (GN.R 324) is triggered since the proposed development will need to develop infrastructure for the storage and handling of dangerous goods (diesel and oils) in containers with a capacity exceeding 30 but not exceeding 80 cubic metres. The project is located within the Limpopo Province.

GNR. 325 (as amended in 2017)	Activity 12 (e)(ii) (GN.R 324)	• *"The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation in (e) Limpopo (ii) within critical biodiversity areas identified in bioregional plans".* • Activity 12 (e)(ii) (GN.R 324) is triggered since the proposed development is located in the Limpopo province and portions of the site has not been lawfully disturbed during the preceding ten years and therefore indigenous vegetation is present on the site. In terms of vegetation type the site falls within the Springbokvlakte Thornveld vegetation type, which is described by Mucina and Rutherford (2006) as Endangered. The development footprint of the solar power plant will be 365ha in extent.
GNR. 325 (as amended in 2017)	Activity 14(ii)(a)(c)(e)(i)(ff) &(hh) (GN.R 324):	• *"The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs (a) within a watercourse or (c) within 32 metres of a watercourse, measured from the edge of a watercourse, (e) within the Limpopo province, (i) outside urban areas within (ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans and (hh) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA".* • Activity 14(ii)(a)(c)(e)(i)(ff)&(hh) is triggered based on the presence of depressions and a drainage line located within the development footprint proposed for the Oribi solar Power Plant. A section of the development footprint is located within a CBA 1 area and the project area is located within 5 km of a number of protected areas.
GNR. 325 (as amended in 2017)	Activity 18 (e)(i) (bb)(ee)(gg) & (hh) (GN.R 324):	• *"The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre (e) Limpopo (i) outside urban areas, (bb) National Protected Area Expansion Strategy Focus areas; (ee) Critical biodiversity areas as identified in systematic*

		biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (hh) areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland." • Activity 18 (e)(i) (bb)(ee)(gg) & (hh) is triggered since the existing access road to the site will need to be widened by more than 4 metres. The project is located within the Limpopo Province and outside urban areas. Depressions and a drainage line are located within the development footprint proposed for the Oribi solar Power Plant. The project area overlaps with Priority focus areas National Protected Areas Expansion Strategy (NPAES), a section of the development footprint is located within a CBA 1 area and the project area is located within 5 km of a number of protected areas.

The potentially most significant impacts will occur during the construction phase of the development, which will include the following activities:

- Site clearing and preparation: Certain areas of the site and access road will need to be cleared of vegetation and some areas may need to be levelled.

- Civil works to be conducted:

- Terrain levelling if necessary – Levelling will be minimal as the potential site chosen is relatively flat.
- Laying foundation - The structures will be connected to the ground through cement pillars, cement slabs or metal screws. The exact method will depend on the detailed geotechnical analysis.
- Construction of access and inside roads/paths – The majority of the access road will follow existing, gravel farm roads that may require widening up to 10 m (inclusive of storm water infrastructure). Where new sections of road need to be constructed (lengthened), this will be gravel/hard surfaced access road and only tarred if necessary. A network of gravel internal access roads (~13km in length) and a perimeter road (~25km in length), each with a width between 4m and 6m, will be constructed to provide access to the various components of the PV development.

- Trenching – all Direct Current (DC) and Alternating Current (AC) wiring within the PV plant will be buried underground. Trenches will have a river sand base, space for pipes, backfill of sifted soil and soft sand and concrete layers where vehicles will pass.

2.3 PHOTOVOLTAIC TECHNOLOGY

The term photovoltaic describes a solid-state electronic cell that produces direct current electrical energy from the radiant energy of the sun through a process known as the Photovoltaic Effect. This refers to light energy placing electrons into a higher state of energy to create electricity. Each PV cell is made of silicon (i.e. semiconductors), which is positively and negatively charged on either side, with electrical conductors attached to both sides to form a circuit. This circuit captures the released electrons in the form of an electric current (direct current). The key components of the proposed project are described below:

- PV Panel Array - To produce up to 150MW, the proposed facility will require numerous linked cells placed behind a protective glass sheet to form a panel. Multiple panels will be required to form the solar PV arrays which will comprise the PV facility. The PV panels will be tilted at a northern angle in order to capture the most sun or using one-axis tracker structures to follow the sun to increase the yield.

Figure 2.1: Typical example of solar PV array

- Wiring to Inverters - Sections of the PV array will be wired to inverters. The inverter is a pulse width mode inverter that converts direct current (DC) electricity to alternating current (AC) electricity at grid frequency.
- Connection to the grid - Connecting the array to the electrical grid requires transformation of the voltage from 480V to 33kV to 132kV. The normal components and dimensions of a distribution rated electrical substation will be required. Output voltage from the inverter

is 480V and this is fed into step up transformers to 132kV. An onsite substation will be required on the site to step the voltage up to 132kV, after which the power will be evacuated into the national grid via the proposed loop-in loop-out connection to the existing Pelly/SAR Pienaarsrivier 132 kV Overhead Line. The connection via Loop in Loop out (LiLo) will be constructed within the limits of the grid connection corridor. The Project will inject up to 150MW into the National Grid (refer to the figure 2.1 below).

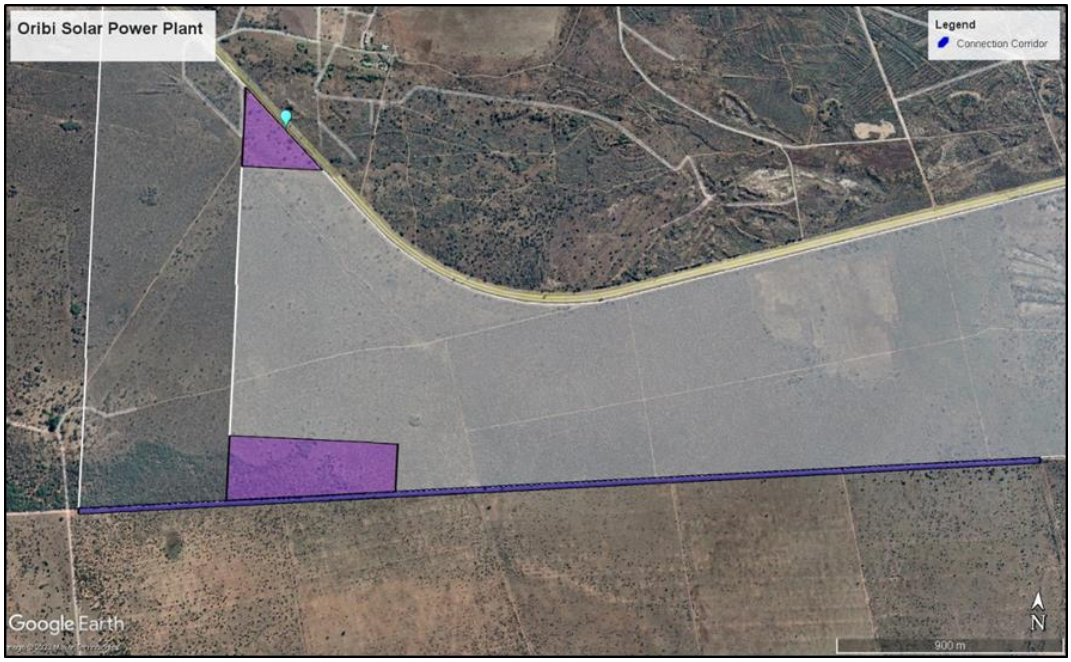


Figure 2.2: Grid connection Corridor for the Oribi SPP

The project will entail the following facility grid connection infrastructure:

- 33kV cabling between the project components and the facility substation.
- A 132kV facility substation.
- 33kV or 132kV cabling or powerline between the facility substation and the Eskom collector switching station.

- Electrical reticulation network – An internal electrical reticulation network will be required and will be lain ~2-4m underground as far as practically possible.

- Supporting Infrastructure – All associated infrastructure will be constructed within the limits of the infrastructure and ancillary complex which will include an on-site substation, Battery Energy Storage System, Operations and Maintenance buildings etc.

- Battery storage – A Battery Storage Facility with a maximum height of 8m and a maximum volume of 1,740 m^3 of batteries and associated operational, safety and control infrastructure.

- Roads – Access will be obtained via a public gravel road off of the D262 district road to the north of the site. An internal site road network will also be required to provide access to the solar field and associated infrastructure.

- Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm. Fencing with a height of 2.5 meters will be used.

2.4 LAYOUT DESCRIPTION

The layout plan will consider and adhere to the limitations of the site and aspects such as environmentally sensitive areas, roads, fencing and servitudes on site – refer to Figures A to H. The total surface area proposed for the layout includes the PV panel arrays (spaced to avoid shadowing), access and maintenance roads and associated infrastructure (buildings, power inverters, power line, battery energy storage system, on-site substation and switching station and perimeter fences). Limited features of environmental significance exist on site, however the sensitivities that do exist have to be avoided in the layout of the solar facility. Table 2.3 below provides detailed information regarding the layout for the proposed facility which will be further assessed during the EIA phase (refer to Figures A to J).

Table 2.3: Technical details for the proposed facility

Component	Description / dimensions
Height of PV panels	6 meters
Area of PV Array	365 Hectares (Development footprint)
Number of inverters required	Minimum 50
Area occupied by inverter / transformer stations / substations / BESS	Central inverters+ LV/MV trafo: 750 m^2 HV/MV substation with switching station: 3,35 ha BESS: 5.5 ha (within the Infrastructure & Ancillary Complex)
Capacity of on-site substation	132kV
Capacity of the power line	132kV
Area occupied by both permanent and construction laydown areas	Permanent Laydown Area: 365 Hectares Construction Laydown Area: ~5 ha
Area occupied by buildings	Infrastructure & Ancillary Complex: ~14.9 ha
Battery storage facility	Maximum height: 8m Maximum volume: 1740 m^3 Capacity ~up to 150MWh
Length of access roads	2.61 km
Width of access roads	10 m
Length of internal roads	12.8 km
Width of internal roads	4 m – 6 m
Length of perimeter roads	24.5 km
Width of perimeter roads	4 m – 6 m
Grid connection corridor width	200m up to 550m
Grid connection corridor length	~ 2.8 km

Power line servitude width	32m
Height of fencing	Approximately 2.5 meters

2.5 SERVICES PROVISION

The following sections provide information on services required on the site e.g. water, sewage, refuse removal, and electricity.

2.5.1 Water

Adequate provision of water will be a prerequisite for the development. Four options will be considered, in order of priority by the Developer:

1. Supply from the Local Municipality (LM). The Developer will approach the Local Municipality to enquire whether they can provide all or part of the total water requirements of the Project. Specific arrangements will be agreed with the Local Municipality in a Service Level Agreement (SLA), following the appointment of preferred bidder during the financial close period.
2. Supply from a Private Contractor, which may include extraction from any bulk water supply lines nearby to the site.
3. Any existing borehole on sites, subject to NWA requirements.
4. A new borehole on site, subject to NWA requirements.

The estimated maximum amount of water required during construction is 1200m³ per month during the 12 - 18 months of construction. The estimated maximum amount of water required during the facility's 20 years of production is 4200m³ per annum. The majority of this usage is for the cleaning of the solar panels. Since each panel requires approximately 2 litres of water for cleaning, the total amount of ~500 000 panels will require 1 000 000 litres per wash. It is estimated that the panels may only need to be washed twice per annum, but provision is made for quaternary cleaning (March, May, July, and September). This totals approximately 4,000,000 litres per annum for washing, and allows 200,000 litres per annum (or 548 litres per day) for toilet use, drinking water, etc.

2.5.2 Stormwater

To avoid soil erosion, it is recommended that the clearing of vegetation be limited. Stormwater management and mitigation measures will be included in the Environmental Management Programme (EMPr) to be submitted as part of the EIR.

2.5.3 Sanitation

During construction phase, portable chemical toilets will be utilised, that will be serviced privately or by the local municipality. Wastewater will be disposed of at a licensed landfill site. Should the contractor decide to install a conservancy tanks/s, this will be done in accordance with the NWA.

No effluent will be produced during operation of the facility, except for normal sewage from site and operations staff. This will be collected and treated as per normal standards using a septic or conservancy tank. In cases where the Local Municipality does not permit the use of sceptic tanks, sewage will be stored in conservancy tank and collected by means of a honey-sucker and treated at an approved facility off site.

2.5.4 Solid Waste

During the construction phase, solid waste will mainly be in the form of construction material, excavated substrate and domestic solid waste. All waste will be disposed of in scavenger proof bins and temporarily placed in a central location for removal by an appointed contractor. Any other waste and excess material will be removed once construction is complete and disposed of at a registered waste facility. During the EIA, the applicant will request confirmation from the municipality that they have sufficient capacity at their registered landfills for the solid waste.

During the operational phase household waste will be removed to a licensed landfill site by a private contractor or by the local municipality.

2.5.5 Electricity

During the construction phase of the development, electricity will either be generated on site through a small solar system or through the use of generators or the existing Eskom supply on the farm will be utilised. This will depend on the Engineering, Procurement, and Construction (EPC) contractor appointed. During operation electricity use will be limited and will primarily be related to the lighting of the facility and domestic use. Design measures such as the use of energy saving light bulbs will be considered by the developer. During the day, electricity will be sourced from the photovoltaic plant, and from the electricity connection at night.

2.6 Decommissioning of the facility

The operating period will be 20 years from the commencement date of the operation phase. Thereafter two rights of renewal periods of 40 years and 20 years will be relevant. It is anticipated that new PV technologies and equipment will be implemented, within the scope of the Environmental Authorisation, when influencing the profitability of the solar facility.

A likely extension of the plant's lifetime would involve putting new, more efficient, solar panels on the existing structures to improve the efficiency of the facility as the technology improves. The specifications of these new panels will be the same as the current panels under consideration, but the conversion efficiency of sunlight to energy will be greater (comparable to new computer chips, that is the same, but faster and more efficient). If, for whatever reason the plant halts operations, the Environmental Authorisation and contract with the landowner will be respected during the decommissioning phase.

<u>The decommissioning process will consist of the following steps:</u>

- The PV facility would be disconnected from the Eskom grid.

- The BESS, inverters and PV modules would be disconnected and disassembled.
- Concrete foundations (if used) would be removed and the structures would be dismantled.
- Wastewater storage conservancy tank would be responsibly removed and area would be rehabilitated.
- The underground cables would be unearthed and removed and buildings would be demolished and removed.
- The fencing would be dismantled and removed.
- The roads can be retained should the landowner choose to retain them, alternatively the roads will be removed and the compaction will be reversed.
- Most of the wires, steel and PV modules are recyclable and would be recycled to a reasonable extent. The Silicon and Aluminium in PV modules can be removed and reused in the production of new modules.
- Any rubble and non-recyclable materials will be disposed of at a registered landfill facility.

The rehabilitation of the site would form part of the decommissioning phase. The aim would be to restore the land to its original form (or as close as possible). The rehabilitation activities would include the following:

- Removal of all structures and rubble;
- Breaking up compaction where required, loosening of the soil and the redistribution of topsoil; and
- Restoration of the surface to the original contours and application of hydro seeding.

3 LEGISLATIVE AND POLICY CONTEXT

This section aims to address the following requirements of the regulations:

Appendix 2. (2) A scoping report (...) must include-

(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;

3.1 INTRODUCTION

Environmental decision making with regards to solar PV plants is based on numerous policy and legislative documents. These documents inform decisions on project level environmental authorisations issued by the National Department of Forestry, Fisheries and the Environment (DFFE) as well as comments from local and district authorities. Moreover, it is significant to note that they also inform strategic decision making reflected in the IDPs and SDFs. Therefore, to ensure streamlining of environmental authorisations it is imperative for the proposed activity to align with the principles and objectives of key national, provincial and local development policies and legislation. The following acts and policies and their applicability to the proposed development are briefly summarised:

- The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)
- National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA]
- The National Energy Act, 2008 (Act 34 of 2008)
- National Water Act, 1998 (Act No. 36 of 1998)
- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999)
- Conservation of Agricultural Resources Act, 1983 (Act No. 85 of 1983)
- The National Forests Act, 1998 (Act 84 of 1998)
- The White Paper on the Energy Policy of the Republic of South Africa (1998)
- The White Paper on Renewable Energy (2003)
- Integrated Resource Plan (IRP) for South Africa (2010-2030)
- National Development Plan of 2030

- National Infrastructure Plan of South Africa (2012)
- New Growth Path Framework (2010)
- Climate Change Bill (2018)
- Climate Change Bill (2021) – for public comment
- Strategic Integrated Projects (SIPs) (2010 – 2030)
- Strategic Environmental Assessment (SEA) for wind and solar PV Energy in South Africa (2014)
- Limpopo Development Plan (LDP) 2020 – 2025
- Limpopo Provincial Spatial Development Framework (PSDF) (2022)
- Waterberg DM Final Integrated Development Plan (IDP) 2020 – 2021 (2020)
- Waterberg District Spatial Development Framework (SDF) (2021)
- Bela-Bela Local Municipality Final Integrated Development Plan 2022 – 2026 (2022)
- Bela-Bela Spatial Development Framework (SDF) (2018)

The key principles and objectives of each of the legislative and policy documents are briefly summarised in Tables 3.1 and 3.2 to provide a reference framework for the implications for the proposed activity.

3.2 LEGISLATIVE CONTEXT

Table 3.1: Legislative context for the construction of photovoltaic solar plants

LEGISLATION	ADMINISTERING AUTHORITY	DATE	SUMMARY / IMPLICATIONS FOR PROPOSED DEVELOPMENT
The Constitution of South Africa **(Act No. 108 of 1996)**	National Government	1996	The Constitution is the supreme law of the Republic and all law and conduct must be consistent with the Constitution. The Chapter on the Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment. Section 24 states that "everyone has the right to (a) an environment that is not harmful to their health or well-being and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The Constitution therefore, compels government to give effect to the people's environmental right and places government under a legal duty to act as a responsible custodian of the country's environment. It compels government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development. The development of the Oribi SPP and the aspects related thereto considers the creation of an environment which is not harmful or degraded through the implementation of appropriate mitigation measures.
The National Environmental Management Act **(Act No. 107 of 1998)**	National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the	1998	NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information; polluter pays; subsidiary;

	Environment) and the Limpopo Province Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA)		waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice. The mandate for EIA lays with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 324, 325, 326, and 327 promulgated in terms of Section 24 of NEMA. The EIA Regulations determine that an Environmental Authorisation is required for certain listed activities, which might have a detrimental effect on the environment. The EIA process undertaken for the Oribi SPP is in-line with the requirements of NEMA for the Application for Environmental Authorisation.
The National Energy Act (Act No. 34 of 2008)	Department of Mineral Resources and Energy	2008	One of the objectives of the National Energy Act was to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including solar: "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). Considering that the Oribi SPP is proposed to make use of PV technology and the solar resource for the generation of electricity, the proposed project is in-line with the Act.
The National Water Act (Act No. 36 of 1998)	Department of Water Affairs (now known as Department of Water and Sanitation)	1998	Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. The intention of the Act is to promote the equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply and sanitation, and environmentally, it provides for the protection of aquatic and associated ecosystems, the reduction and prevention of pollution and degradation of water resources. As this Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and

			beneficial use of water in the public interest, a person can only be entitled to use water if the use is permissible under the Act. Chapter 4 of the Act lays the basis for regulating water use. Should a water use license be required for the project, the National Water Act will be applicable in terms of obtaining the relevant license.
National Environmental Management: Waste Act **(Act No. 59 of 2008)**	National Department Environmental Affairs (DEA) (now known as the Department of Forestry, Fisheries and the Environment)	2008	NEMWA has been developed as part of the law reform process enacted through the White Paper on Integrated Pollution and Waste Management and the National Waste Management Strategy (NWMS). The objectives of the Act relate to the provision of measures to protect health, well-being and the environment, to ensure that people are aware of the impact of waste on their health, well-being and the environment, to provide for compliance with the measures, and to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being. Regulations No. R921 (of 2013) promulgated in terms of Section 19(1) of the National Environmental Management: Waste Act (59 of 2008) determines that no person may commence, undertake or conduct a waste management activity listed in this schedule unless a license is issued in respect of that activity. It is not envisaged that a waste permit will be required for the proposed development as no listed activities in terms of waste management are expected to be triggered.
National Environment Management: Air Quality Act **(Act No. 39 of 2004)**	National Department Environmental Affairs (DEA) (now known as the Department of Forestry, Fisheries and the Environment)	2004	The object of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development. Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1)(a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not

			envisaged that an Atmospheric Emission License will be required for the proposed development.
The National Heritage Resources Act **(Act No. 25 of 1999)**	South African Heritage Resources Agency (SAHRA)	1999	The Act aims to introduce an integrated and interactive system for the management of heritage resources, to promote good governance at all levels, and empower civil society to nurture and conserve heritage resources so that they may be bequeathed to future generations and to lay down principles for governing heritage resources management throughout the Republic. It also aims to establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources, to set norms and maintain essential national standards and to protect heritage resources, to provide for the protection and management of conservation-worthy places and areas by local authorities, and to provide for matters connected therewith. The Act protects and manages certain categories of heritage resources in South Africa. For the purposes of the Heritage Resources Act, a "heritage resource" includes any place or object of cultural significance. In this regard the Act makes provision for a person undertaking an activity listed in Section 28 of the Act to notify the resources authority. The resources authority may request that a heritage impact assessment be conducted if there is reason to believe that heritage resources will be affected. A case file has been opened on SAHRIS for the Oribi SPP and all relevant documents were submitted for their comments and approval. The Heritage Impact Assessment undertaken for the SPP is included as Appendix E5, and the Palaeontological Impact Assessment is included as Appendix E6.
Conservation of Agricultural Resources Act (Act No. 85 of 1983)	National and Provincial Government	1983	The objective of the Act is to provide control over the utilisation of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

			Consent will be required from the Department of Agriculture, Forestry and Fisheries (now known as the DFFE) in order to confirm that the proposed development is not located on high potential agricultural land and to approve the long term lease agreement. A Soils and Agricultural Potential Assessment has been undertaken for the Oribi SPP and is included as Appendix E4.
The National Forests Act, 1998 (Act 84 of 1998)	Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment)	1998	The purposes of this Act are to: (a) promote the sustainable management and development of forests for the benefit of all; (b) create the conditions necessary to restructure forestry in State forests; (c) provide special measures for the protection of certain forests and trees: (d) promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes. (e) promote community forestry; (f) promote greater participation in all aspects of forestry and the forest products industry by persons disadvantaged by unfair discrimination. Section 12(1) read with s15(1) of the NFA stated that the Minister may declare a particular tree, group of trees, woodland; or trees belonging to a particular species, to be a protected tree, group of trees, woodland or species. A list of protected tree species was gazetted in GN 635 of 6 December 2019. The effect of the declaration is that no person may (a) cut, disturb, damage or destroy; or (b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree, except under a license granted by the Minister; or in terms of an exemption published by the Minister in the Gazette. A Terrestrial Ecology Baseline and Impact Assessment has been undertaken for the Oribi SPP and is included in Appendix E1.

3.3 POLICY CONTEXT

Table 3.2: Policy context for the construction of photovoltaic solar plants

POLICY	ADMINISTERING AUTHORITY	DATE	SUMMARY / IMPLICATIONS FOR PROPOSED DEVELOPMENT
The White Paper on the Energy Policy of the Republic of South Africa	Department of Mineral Resources and Energy	1998	The White Paper on the Energy Policy of the Republic of South Africa establishes the international and national policy context for the energy sector, and identifies the following energy policy objectives: • Increasing access to affordable energy services • Improving energy governance • Stimulating economic development • Managing energy-related environmental and health impacts • Securing supply through diversity • Energy policy priorities The White Paper sets out the advantages of renewable energy and states that Government believes that renewables can in many cases provide the least cost energy service, particularly when social and environmental costs are included. 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 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. Oribi SPP is in line with this policy as it proposes the generation of renewable energy from the solar resource.
The White Paper on Renewable Energy	Department of Mineral Resources and Energy	2003	This White Paper on Renewable Energy supplements the *White Paper on Energy Policy*, which recognises 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 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. 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-subsidised alternative to fossil fuels. The medium-term (10-year) target set in the White Paper is: *10 000 GWh (0.8 Mtoe) 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% (1667 MW) of the projected electricity demand for 2013 (41539 MW) (Executive Summary, ix).* The Oribi SPP is in line with this paper as it proposes the generation of renewable energy from the solar resource.
Integrated Resource Plan (IRP) for South Africa	Department of Mineral Resources and Energy	2010-2030	The Integrated Resource Plan for Electricity for South Africa of 2010–2030 (further referred to as the IRP) is a "living plan" which is expected to be revised and updated continuously as necessary due to changing circumstances. According to the Summary of the plan the current IRP for South Africa, which was originally initiated by the Department of Energy (DoE) in June 2010 (the Department is now known as Department of Mineral Resources and Energy), led to the Revised Balanced Scenarios (RBS) for the period 2010–2030.

"*This scenario was derived based on the cost-optimal solution for new build options (considering the direct costs of new build power plants), which was then "balanced" in accordance with qualitative measures such as local job creation".* In addition to all existing and committed power plants, the RBS included 11,4 GW of renewables, which relates to the proposed Oribi Solar Power Plant. In 2010 several changes were made to the IRP model. The main changes in the IRP were the disaggregation of renewable energy technologies to explicitly display solar photovoltaic (PV), concentrated solar power (CSP), and wind options (RSA, 2011a).

The summary of the IRP further explains that traditional cost-optimal scenarios were developed based on the previously mentioned changes in the IRP. This resulted in the Policy-Adjusted IRP, which stated that:

"*The installation of renewables (solar PV, CSP and wind) have been brought forward in order to accelerate a local industry*; *To account for the uncertainties associated with the costs of renewables and fuels, a nuclear fleet of 9,6 GW is included in the IRP; The emission constraint of the RBS (275 million tons of carbon dioxide per year after 2024) is maintained; and Energy efficiency demand-side management (EEDSM) measures are maintained at the level of the RBS*" (RSA, 2011a:6).

"The Policy-Adjusted IRP includes the same amount of coal and nuclear new builds as the RBS, while reflecting recent developments with respect to prices for renewables. In addition to all existing and committed power plants (including 10 GW committed coal), the plan includes 9,6 GW of nuclear; 6,3 GW of coal; 17,8 GW of renewables; and 8,9 GW of other generation sources" (RSA, 2011a:6).

The IRP highlights the commitments before the next IRP. The commitments pertaining to the purpose of the proposed project in renewable energy is: "*Solar PV programme 2012-2015: In order to facilitate the connection of the first solar PV units to the grid in 2012 a firm commitment to this capacity is necessary. Furthermore, to provide the security of investment to ramp up a sustainable local industry cluster, the first four years from 2012 to 2015 require firm commitment."*

"*Solar PV 2016 to 2019: As with wind, grid upgrades might become necessary for the second round of solar PV installations from 2016 to 2019, depending on their location. To trigger the associated tasks in a timely manner, a firm commitment to these capacities is necessary in the next round of the IRP at the latest. By then, the assumed cost decreases for solar PV will be confirmed*" (IRP, 2011a:17).

In conclusion the IRP recommends that an accelerated roll-out in renewable energy options should be allowed with regards to the benefits of the localization in renewable energy technologies (RSA, 2011a). It is however important to take note that since the release of the IRP in 2011 there has been a number of developments in the energy sector of South Africa. Therefore, the IRP was updated and was open for comments until March of 2017. The new IRP of 2019 was formally published in October 2019. For the revision scenario, analysis was conducted. The results revealed that for the period ending 2030 that: *"The committed Renewable Energy Independent Power Producers Programme, including the 27 signed projects and Eskom capacity rollout ending with the last unit of Kusile in 2022, will provide more than sufficient capacity to cover the projected demand and decommissioning of plants up to approximately 2025"; "Imposing annual build limits on renewable energy will not affect the total cumulative capacity and the energy mix for the period up to 2030*"; and *"the scenario without renewable energy annual build limits provides the least-cost option by 2030*" (RSA, 2018:34).

Lastly, the Final IRP of 2018 also included the scenario analysis for the period post 2030. Here it was observed that: "*Imposing annual build limits on renewable energy will restrict the cumulative renewable installed capacity and the energy mix for this period; adopting no annual build limits on renewables or imposing a more stringent strategy to reduce greenhouse gas emissions implies that no new coal power plants will be built in the future unless affordable cleaner forms of coal-to-power are available; and the scenario without renewable energy annual build limits provides the least-cost option by 2050*" (RSA, 2018:34–35).

In the final IRP of 2019 key considerations were taken into account together with required actions to be taken for the IRP of 2019 to be credible. In terms of renewable energy technologies like solar and wind, the IRP stated that *"The application of renewable build limits 'smoothes out' the capacity allocations for wind and solar PV which provides a constant pipeline of projects to investment; this addresses investor confidence*". The decision stated against this key consideration is to *"retain the current annual build limits on renewables (wind and PV) pending the finalization of a just transition plan"* (RSA, 2019:46). Hereby the IRP also recognises renewable technologies' potential to diversify the electricity mix, create new industries and job opportunities and localize across the value chain (RSA, 2019:13).

			The Oribi SPP is in line with this plan as it proposes the generation of renewable energy from the solar resource and will contribute to the energy mix of the country as set out in this plan.
National Development Plan of 2030	The Presidency: National Planning Commission	-	The National Development Plan aims to "*eliminate poverty and reduce inequality by 2030*" (RSA, undated). In order to eliminate or reduce inequality, the economy of South Africa needs to grow faster in order to benefit all South Africans. In May 2010 a Final National Development Plan was Finaled, which highlighted the nine (9) key challenges for South Africa. The highest priority areas according to the plan are considered to be the creation of employment opportunities and to improve the quality of national education. In this regard, the plan sets out three (3) priority areas, namely, to raise employment by a faster growing economy, improve the quality of education, and to build the capability of the state in order to play a more developmental and transformative role. One of the key challenges identified was that the economy is unsustainably resource intensive and the acceleration and expansion of renewable energy was identified as a key intervention strategy to address this challenge. Oribi SPP will contribute to the intervention strategy as identified within the plan.
National Infrastructure Plan of South Africa	Presidential Infrastructure Coordinating Commission	2012	In the year 2012 the South African Government adopted a National Infrastructure Plan (hereafter referred to as the Plan). The aim of this Plan is to transform the economic landscape, while strengthening the delivery of basic services and creating new employment opportunities. This Plan also supports the integration of African communities, and also sets out the challenges and enablers that our country needs in order to respond to the planning and development of infrastructure with regards to fostering economic growth (RSA, 2012). The Plan has developed eighteen (18) strategic integrated projects (further referred to as SIPs). These SIPs stretch over all nine (9) provinces, covering social and economic infrastructure, and projects that enhances development and growth. Of the eighteen (18), five (5) are geographically focused, three (3) spatial, three (3) energy, three (3) social infrastructure, two (2) knowledge, one (1) regional integration, and one (1) water and sanitation focussed. The three (3) SIPs according to the Plan, which are energy focused and correlate to the proposed project are as follow: • SIP 8: Green energy in support of the South African economy; • SIP 9: Electricity generation to support socio-economic development; and

		• SIP 10: Electricity transmission and distribution for all. SIP 8 according to the Plan "*support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the IRP 2010 and support bio-fuel production facilities*". The purpose of SIP 9 according to the Plan is to "*accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances*". SIP 9 should also monitor the implementation of major projects such as new power stations like Medupi, Kusile and Ingula. Lastly, SIP 10 aims to "*expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development*" (RSA, 2012:20). The Oribi SPP is in line with this plan as it proposes the generation of renewable energy from the solar resource which supports socio-economic development and will contribute to meeting the electricity demand of the country as set out in this plan.
New Growth Path Framework	Department of - Economic Development	The New Growth Path was developed after 16 years of South Africa's democracy, to respond to emerging opportunities and risks while building on policies. This framework provides a dynamic vision on how to collectively achieve a more developed, equitable and democratic society and economy. This framework mainly reflects the commitment of the South African Government to create employment opportunities for its people in all economic policies (RSA, 2011b). This framework sets out the markers for job creation and growth and identify where there are viable changes in the character and structure of production, in order to create a more inclusive, greener economy in the long-term. It is stated in the framework that in order for this framework to reach its objectives, the Government is committed to: • Identify the possible areas of employment creation; and • Develop a policy to facilitate employment creation especially with regards to social equity, sustainable employment and growth in the creation of employment activities (RSA, 2011b).

			This framework also identifies investments in five key areas, one of which is energy. This framework also states that the green economy is a priority area, which includes the construction of and investment in renewable energy technologies like solar (RSA, 2011b). In this regard it will also assist creating employment opportunities over the medium- and long-term. Considering that the construction of and investment in renewable energy is a key area identified within the framework, the Oribi SPP is considered to be in-line with the framework.
Climate Change Bill	National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment)	2018	On 08 June 2018 the Minister of Environmental Affairs published the Climate Change Bill ("the Bill") for public comment. The Bill provides a framework for climate change regulation in South Africa aimed at governing South Africa's sustainable transition to a climate resilient, low carbon economy and society. The Bill provides a procedural outline that will be developed through the creation of frameworks and plans. The following objectives are set within the Bill: • Provide for the coordinated and integrated response to climate change and its impacts by all spheres of government in accordance with the principles of cooperative governance; • Provide for the effective management of inevitable climate change impacts through enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to building social, economic, and environmental resilience and an adequate national adaptation response in the context of the global climate change response; • Make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe and in a manner that enables economic, employment, social and environmental development to proceed in a sustainable manner. The Oribi SPP comprises a renewable energy generation facility and would not result in the generation or release of emissions during its operation.

Climate Change Bill	National Department of Forestry, Fisheries and the Environment	2021	The Department of Forestry, Fisheries and the Environment has published a new Climate Change Bill for public comment. The bill notes that climate change represents an urgent threat to human societies and the planet, and requires an effective, progressive and incremental response from both government and citizens. It recognises that South Africa has a global responsibility to reduce greenhouse gasses and that the anticipated impacts arising as a result of climate change have the potential to undermine achieving of the country's developmental goals. The main objective of the bill is to enable the development of an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society, and to provide for matters connected therewith. The Oribi SPP comprises a renewable energy generation facility and would not result in the generation or release of emissions during its operation.
Strategic Integrated Projects (SIPs)	The Presidential Infrastructure Coordinating Committee	2010 - 2030	The Presidential Infrastructure Coordinating Committee (PICC) is integrating and phasing investment plans across 18 Strategic Infrastructure Projects (SIPs) which have five core functions: to unlock opportunity, transform the economic landscape, create new jobs, strengthen the delivery of basic services and support the integration of African economies. A balanced approach is being fostered through greening of the economy, boosting energy security, promoting integrated municipal infrastructure investment, facilitating integrated urban development, accelerating skills development, investing in rural development and enabling regional integration. SIP 8 and 9 of the energy SIPs supports the development of the solar energy facility: • SIP 8: Green energy in support of the South African economy: Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010 – 2030) and supports bio-fuel production facilities. • SIP 9: Electricity generation to support socio-economic development: The proposed Oribi SPPis a potential SIP 9 Project as electricity will be generated and social and economic upliftment, development and growth will take place within the surrounding communities. It would become a

			SIP 9 project if selected as a Preferred Bidder project by the Department of Mineral Resources and Energy. SIP 9 supports the acceleration of the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances. The Oribi SPP could be registered as a SIP project once selected as a preferred bidder under the REIPPP Programme. The project would then contribute to the above-mentioned SIPs.
Strategic Environmental Assessment (SEA) for wind and solar PV Energy in South Africa	National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment)	2014	The Department of Forestry, Fisheries and the Environment (DFFE) has committed to contribute to the implementation of the National Development Plan and National Infrastructure Plan by undertaking Strategic Environmental Assessments (SEAs) to identify adaptive processes that integrate the regulatory environmental requirements for Strategic Integrated Projects (SIPs) while safeguarding the environment. The wind and solar photovoltaic (PV) SEA was accordingly commissioned by DEA in support of SIP 8, which aims to facilitate the implementation of sustainable green energy initiatives. This SEA identifies areas where large scale wind and solar PV energy facilities can be developed in terms of SIP 8 and in a manner that limits significant negative impacts on the environment, while yielding the highest possible socio-economic benefits to the country. These areas are referred to as Renewable Energy Development Zones (REDZs). The REDZs also provide priority areas for investment into the electricity grid. Currently one of the greatest challenges to renewable energy development in South Africa is the saturation of existing grid infrastructure and the difficulties in expanding the grid. Proactive investment in grid infrastructure is the likely to be the most important factor determining the success of REDZs. Although it is intended for the SEA to facilitate proactive grid investment in REDZs, such investment should not be limited to these areas. Suitable wind and solar PV development should still be promoted across the country and any proposed development must be evaluated on its own merit. The Oribi SPP is not located within a REDZ, but the development will contribute to the expansion of renewable energy facilities and infrastructure within the country, and provide the positive opportunities associated with it.

The Limpopo Development Plan (LDP)	Limpopo Provincial Government - Office of the Premier	2020-2025	The Limpopo Development Plan (LDP) 2020-2025 is the socio-economic development blueprint for the Limpopo Province. It outlines the contribution of the Limpopo Province to the National Development Plan (NDP) and provides a framework for the strategic plans of provincial government departments and municipalities in the province. The LSDF should build on and give spatial expression to the LDP 2020-2025 components, where possible and relevant. The LDP also creates a structure for the constructive participation of private-sector business, organised labour and citizens, towards the achievement of the provincial growth and development objectives. The LDP 2020-2025 defines the provincial long-term vision as "Limpopo – Africa's New Pride. A resilient, vibrant, prosperous Province inspired by its diverse and creative people and its environment." The objectives of the Limpopo Development Plan are the following: • Ensure sustainable development. • Create decent employment through inclusive economic growth and sustainable livelihoods. • Improve the quality of life of citizens. • Raise the effectiveness and efficiency of a developmental public service. • Promote vibrant and equitable sustainable rural communities. • Prioritise social protection and social investment. The development of the Oribi SPP is in-line with the LDP based on the contributions and opportunities presented by a development of this nature.
Limpopo Provincial Spatial Development Framework (PSDF)	Limpopo Provincial Government - Office of the Premier	2022	The spatial vision of the Limpopo Province is as follows: *"The Limpopo PSDF envisions a provincial spatial structure where the natural environment and valuable agricultural land are protected for future generations, with a strong, diverse and growing economy, and that offers its residents high quality living environments and good job opportunities".* The Provincial Spatial outcomes contextualized for the Limpopo Province is as follows:

1. A network of consolidated, transformed and well-connected urban nodes, regional development anchors and rural service centres that enable Limpopo to derive maximum transformative benefit from urbanisation and concentrated rural settlements, enabling climate change adaptation, inclusive economic development and equal, effective and efficient access to social services in support of equitable and inclusive provincial human capital development.
2. Provincial-scale corridors and productive rural regions enable sustainable livelihoods supported by economic diversification through green industrialisation and participation in the Fourth Industrial Revolution, mutually beneficial urban-rural linkages, and wise management, nurturing and conservation of ecological assets and ecosystem services.
3. Provincial connectivity and movement infrastructure systems are strategically located, extended and maintained, to support a diverse, ecologically sustainable, adaptive, regenerative and inclusive economy, and a set of key provincial, national and regional gateway cities and towns.
4. Productive rural regions are supported by sustainable resource economies and strong and resilient regional development anchors provide effective, efficient and equitable access to people living in rural areas to the provincial, national and global economy.
5. The provincial ecological infrastructure and natural resource foundation are well-protected and managed, to enable climate change mitigation and sustainable and equitable access to water, high-potential agricultural land, minerals and other natural resources, both for current and future generations.

The Provincial objectives are as follows:

- Capitalise on the Province's strategic location within the SADC region to facilitate trade links and regional cooperation on resource sharing;
- Capitalise on, and improve regional and local connectivity to establish a connected network of nodes and settlements;

			• Provide a strategic and coherent rationale for public sector investment, including engineering, community and economic infrastructure, to optimise service delivery; • Encourage urban and rural spatial restructuring to address spatial injustice and facilitate climate change mitigation and adaptation; • Aggressively protect and enhance the Province's natural resources, including scarce fresh water sources and high biodiversity landscapes; • Guard valuable agricultural land as a scarce resource and national asset; • Consolidate and enhance the Province's ecotourism product; • Encourage and institutionalise the sustainable development of its massive mineral potential and encourage diversification and industrialisation through green economy initiatives; and • Create an enabling environment for both large- and small-scale business development (retail, office, commercial, industrial). The development of the Oribi SPP is in line with the spatial vision of the Limpopo Province.
Waterberg DM Final Integrated Development Plan (IDP)	Waterberg DM	2020–2021 (2020)	The Integrated Develop Planning is a mandatory and over arching process run collectively by all role players within the municipality to achieve developmental objectives of local government. Developmental Local Government has an obligation to provide basic services through an interaction between numerous stakeholders within the municipal area. It is through this collective interaction commonly known as the "The Theatre of planning" that the DM intends to address service delivery challenges facing the municipality and our communities. The vision of the Waterberg DM is "*To be the best energy hub and eco-tourism destination in Southern Africa."* The Mission Statement is: *"To invest in a constituency of talented human capital who are motivated and innovated to build a sustainable economy in the field of energy, minerals and eco-tourism for the benefit of all our communities".* The development of the Oribi SPP will contribute to the achievement of the mission and vision for the Waterberg DM.

Waterberg District Spatial Development Framework (SDF)	Waterberg DM	2021	The Waterberg SDF poses the following spatial vision for the district: "A spatially functional and equitable district that is a conductive living environment for all, an energy hub and eco-tourism destination". The spatial development objectives of the Waterberg SDF are as follows: • A spatially functional District: Ensure a spatially functional district that optimises the use of resources and achieve a sustainable balance between macro land uses; • Integrated sustainable human settlements: Ensure that integrated and sustainable human settlements are developed that redress spatial imbalances and promote inclusive and sustainable land development; • Investment in targeted nodes: Ensure that development in higher order urban nodes is prioritised and that such nodes provide a range of development opportunities according to the comparative advantages and needs of the communities; • Sustainable rural livelihoods: Improve rural areas by creating integrated and sustainable livelihoods; • A connected District: Ensure a well-functioning District that is connected and provide digital connectivity, convenience and economic prosperity; • Integrated and consolidated service delivery: Ensure a functional District and conducive living conditions for all the residents by following an integrated approach in providing engineering infrastructure by all spheres of government. The development of the Oribi SPP will contribute to the objective of the area.
Bela-Bela Local Municipality (LM) Final Integrated Development	Bela-Bela LM	2022	The vision for the Bela-Bela Local Municipality is to be: "*…the prime agricultural hub and eco-tourism destination of choice".* Their mission is to constantly strive towards the achievement of: • An effective and efficient services delivery; • Stakeholders driven economic development and growth;

Plan 2022 – 2026			• Sustainable job creation opportunities of communities; and • A safe, healthy and prosperous environment. Bela-Bela Municipality commits itself to adhere to the municipal core policies and values which are: • Accountability; • Fairness; • Effectiveness; • Commitment; and • Honesty and Sincerity. The development of the Oribi SPP will contribute to the achievements of the objectives of the LM.
Bela-Bela Spatial Development Framework (SDF)	Bela-Bela LM	2018	The Municipality has adopted the SDF and it was gazetted on the 15th of February 2019. Map 3 and 4 in particular depicts various Land uses within the Municipality. Subsequently Waterberg District Municipality also assisted the Municipality with the compilation of the Central Business District (CBD) Development Plan. Both plans will assist the Municipality in processing planning and development applications and thereby contributing towards creating conducive environment for investment and sustainable economic development within the Municipality, if properly implemented. The development of the Oribi SPP will contribute to creating a conducive environment for investment and sustainable economic development within the Municipality.

3.4 OTHER LEGISLATION

Other legislation mainly refers to the following:

- Planning legislation governing the rezoning process and approval of the layout plan.
- Design standards and legislation for services provision such as water, sewerage, electricity, etc.
- Municipal bylaws related to building plans, building regulations, etc.

3.5 RELEVANT GUIDANCE

The following guidance was considered in conducting the EIA:

- The Equator principles III (2020)
- World Bank Group Environmental, Health and Safety General Guidelines (EHS Guidelines) (2007)
- Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution (2007)
- International Finance Corporation's Policy on Environmental and Social Sustainability (2012)
- DEA. (2013). Final National Renewable Energy Guideline. Department of Environmental Affairs, Pretoria, South Africa
- DEA, (2012), Guideline 5 – Final companion to the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations of 2010
- DEA, (2012), Guideline 7 – Public participation in the Environmental Impact Assessment process
- DEA, (2012), Guideline 9 – Need and desirability
- DEA, (2006), Guideline 3 – General guide to the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 4 – Public participation in support of the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 5 – Assessment of alternatives and impacts in support of the Environmental Impact Assessment Regulations
- BirdLife, (2017). Best Practise Guidelines Birds & Solar Energy: Guidelines for assessing and monitoring the impact of solar power generating facilities on bird in southern Africa.

3.6 CONCLUSION

The EIA was undertaken in accordance with the EIA Regulations (as amended) published in GNR 326, in terms of Section 24(5) and 44 of the NEMA as amended as well as all relevant National legislation, policy documents, national guidelines, the World Bank EHS Guidelines, the IFC Performance Standards, and the Equator Principles.

The legislative and policy context plays an important role in identifying and assessing the potential social impacts associated with the proposed development, as well as an indication of the need and desirability of the proposed development from a national, provincial and local level. For this reason, the proposed development project will be assessed in terms of its fit with the key legislative, policy and planning documents discussed above.

The main findings of the review of the policy documents on all spheres of Government indicated that strong support was given towards renewable energy, specifically PV solar energy and therefore it is concluded that there is support for the development of the Oribi Solar Power Plant. The White Paper on the Energy Policy of the Republic of South Africa of 1998 stated that due to the fact that renewable energy resources operate from an unlimited resource base, i.e. the sun, renewable energy can increasingly contribute towards a long-term sustainable energy supply for future generations. This policy further highlights that due to the unlimited resources base of renewable energy in South Africa, renewable energy applications, like PV solar energy and associated infrastructure, are more sustainable in terms of social and environmental costs. The Integrated Resource Planning for Electricity for South Africa of 2010–2030, the National Infrastructure Plan of South Africa and the New Growth Path Framework all support the development of the renewable energy sector. In particular, the IRP also indicated that 43% of the energy generation in South Africa is allocated to renewable energy applications. On a District and Local level limited attention is given explicitly to renewable sources like PV solar energy, however the documents reviewed do make provision for such developments and efficiency in improving the quality of lives in terms of efficient physical infrastructure as well as socio-economic growth. At Provincial, District and Local level the policy documents support the applications of renewables.

The review of the relevant policies and documents related to the energy sector therefore indicate that renewables, like solar energy and the establishment of solar energy facilities and associated infrastructure, are supported on all spheres of Government. The proposed Oribi SPP is therefore supported by the related policy and planning documents reviewed in this section of the report.

4 THE NEED AND DESIRABILITY

This section aims to address the following requirements of the regulations:

> **Appendix 2.** (2) A scoping report (...) must include – (f) a motivation for the need and desirability of the activity in the context of the preferred location.

4.1 THE NEED FOR THE PROPOSED ACTIVITY

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

Over 90% of South Africa's electricity generation is coal based, the Word bank estimates that this results in an annual, per capita carbon emission of ~8.9 tons per person. Based on 2008 fossil-fuel CO2 emissions statistics released by the Carbon Dioxide Information Analysis Centre, South Africa is the 13th largest carbon dioxide emitting country in the world and the largest emitter in Africa (Boden, et al. 2011).

The proposed project is intended to form part of the Department of Mineral Resources and Energy's (DMREs) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme or any other appropriate energy generation programmes/opportunities. The REIPPP Programme aims to secure 14 725 Megawatts (MW) of new generation capacity from renewable energy sources, while simultaneously diversifying South Africa's electricity mix. According to the 2021 State of the Nation Address, Government, the procurement of an additional 11 800 MW of power from renewable energy, natural gas, battery storage and coal in line with the Integrated Resource Plan 2019 and fulfilling their commitments under the United Nations Framework Convention on Climate Change and its Paris Agreement which include the reduction of greenhouse gas emissions. Eskom, the largest greenhouse gas emitter of South Africa, has committed in principle to net zero emission by 2050 and to increase its renewable capacity. During the 2022 State of the Nation Address it was indicated that during the past year the government had taken "firm steps" to bring additional generation capacity online as quickly as possible to close the shortfall in terms of electricity. As a result, it was confirmed that several new generation projects will be coming online over the next few years.

Besides capacity additions, several assumptions have changed since the promulgation of IRP 2010–2030. Key assumptions that changed include the electricity demand projection, Eskom's existing plant performance, as well as new technology costs. These changes necessitated the review and update of the IRP which resulted in the Final IRP 2018 that was made available for comment and updated to the Final IRP 2019 as per table 4.1 below:

Table 4.1: Published Final IRP 2019 (Approved by Cabinet for Consultation)

	Coal	Coal (Decommissioning)	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	-2373					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 1000	1600			
2023	750	-555				1000	1600			500
2024			1860				1600		1000	500
2025						1000	1600			500
2026		-1219					1600			500
2027	750	-847					1 600		2000	500
2028		-475				1000	1 600			500
2029		-1694			1575	1000	1 600			500
2030		-1050		2 500		1 000	1 600			500
TOTAL INSTALLED CAPACITY by 2030 (MW)	33364		1860	4600	5000	8288	17742	600	6380	
% 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

According to the South African Energy Sector Overview (2021), there is currently 1 723MW of installed PV capacity, while an additional 2 600MW and 860MW from wind and solar has been rewarded as part of Bid window 5 and 6, respectively (latter announced in 2022).

4.2 THE DESIRABILITY OF THE PROPOSED ACTIVITY

The facility's contribution towards sustainable development and the associated benefits to society in general is discussed below:

- Lesser dependence on fossil fuel generated power - The deployment of the facility will have a positive macro-economic impact by reducing South Africa's dependence on fossil fuel generated power and assisting the country in meeting its growing electricity demand.
- Increased surety of supply - By diversifying the sources of power in the country, the surety of supply will increase. The power demands of South Africa are ever increasing and by adding solar power this demand can be met, even exceeded without increasing pollution in relation to the use of fossil fuels. The project has the potential of "securing" economic activity by assisting in removing supply constraints if Eskom generation activities result in a supply shortfall. When supply is constrained, it represents a limitation to economic growth. When a supply reserve is available, it represents an opportunity for economic growth.
- Local economic growth - The proposed project will contribute to local economic growth by supporting industry development in line with provincial and regional goals and ensuring advanced skills are drawn to the Limpopo Province. The project will likely encounter

widespread support from government, civil society and businesses, all of whom see potential opportunities for revenues, employment and business opportunities locally. The development of the photovoltaic solar facility will in turn lead to growth in tax revenues for local municipalities and sales of carbon credits, resulting in increased foreign direct investment. The location of the proposed development within the Bela-Bela Local Municipality is desirable since the overall municipal unemployment rate was found to be 47.2%, % (Census 2011 data).

- Lower costs of alternative energy - An increase in the number of solar facilities commissioned will eventually reduce the cost of the power generated through solar facilities. This will contribute to the country's objective of utilising more renewable energy and less fossil fuel-based power sources. It will assist in achieving the goal to generate 14 725 MW of electricity from renewable energy as per the Renewable Energy Independent Power Producer Procurement (REIPPP) Programme of the Department of Mineral Resources and Energy. The Government will be initiating the procurement of an additional 11 800 MW of renewable energy as stated during the 2021 State of the Nation Address.

- Reduction in greenhouse gas emissions - The additional power supplied through solar energy will reduce the reliance on the combustion of fossil fuels to produce power. The South African electricity grid is predominantly coal-fired and therefore GHG emissions intensive (coal accounts for more than 92% of the fuel used in South Africa's electricity generation). The reduction of GHG emissions as a result of the project implementation will be achieved due to reduction of CO_2 emissions from combustion of fossil fuel at the existing grid-connected power plants and plants which would likely be built in the absence of the project activity.

- CDM Project - A solar energy facility also qualifies as a Clean Development Mechanism (CDM) project (i.e. a financial mechanism developed to encourage the development of renewable technologies).

- Climate change mitigation - On a global scale, the project makes a contribution to greenhouse gas emission reduction and therefore contributes toward climate change mitigation.

- Reduced environmental impacts - The reduction in non-renewable electricity consumed from the grid will not only result in a reduction in greenhouse gas emissions, but also the prevention of negative impacts associated with coal mining. For example, coal power requires high volumes of water, in areas of South Africa where water supply is already over-stretched and water availability is highly variable. Photovoltaic solar energy technology also does not produce the sulphur emissions, ash or coal mining concerns associated with conventional coal fired electricity generation technologies resulting in a relatively low level of environmental impacts. It is a clean technology which contributes toward a better-quality environment for employees and nearby communities.

- Social benefits - The project activity is likely to have significant long-term, indirect positive social impacts that may extend to a regional and even national scale. The larger scale impacts are to be derived in the utilization of solar power and the experience gained through the construction and operation of the power plant. In future, this experience can be employed at other similar solar installations in South Africa.

- Provision of job opportunities - The main benefit of the proposed development operating in the area is that local companies or contractors will be hired for the duration of the

construction period. The operational phase will provide permanent job opportunities to the local communities from the surrounding area since security guards and general labourers will be required on a full-time basis. Approximately 500 employment opportunities will be created during the construction and operational phases.

- Indirect socio-economic benefits - The increase in the demand for services such as accommodation, transportation, security, general maintenance and catering will generate additional indirect socio-economic benefits for the local community members.

- Effective use of resources - Because of predominantly the climate and soil limitations, the site is totally unsuitable for cultivated crops, and the viable agricultural land use is limited to grazing only. The proposed development in this specific area will generate alternative land use income through rental for the proposed energy facility, which will have a positive impact on agriculture. It will provide the farming enterprise with increased cash flow and rural livelihood, and thereby improve the financial sustainability of agricultural activities.

- Increased access to electricity: Despite the abundant availability of coal, electricity generation and the development of related infrastructure has been inadequate in providing access to electricity for entire population of approximately 60 million people. South Africa has been described as a country with an energy-deprived population with more than 1.5 million households comprising approximately 5 million people that are without electricity. The national electricity crises of 2010 and the resultant effects on South African residents and the economy has highlighted how highly reliant we are on electricity as a source of energy. Government has committed to developing measures to promote energy saving, reduce energy costs to the economy, and reduce the negative impact of energy use on the environment.

- Cumulative impacts of low to medium significance – No cumulative impacts with a high residual risk have been identified. In terms of the desirability of the development of sources of renewable energy therefore, it may be preferable to incur a higher cumulative loss in such a region as this one, than to lose land with a higher environmental value elsewhere in the country.

5 DESCRIPTION OF ENVIRONMENTAL ISSUES

This section aims to address the following requirements of the regulations:

Appendix 2. (2) A scoping report (...) must include-

(h) 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 the alternatives considered;

(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;

(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.

(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

(ix) the outcome of the site selection matrix;

(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and

(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;

5.1 CONSIDERATION OF ALTERNATIVES

The DEAT 2006 guidelines on assessment of alternatives and impacts proposes the consideration of four types of alternatives namely, the no-go, location, activity, and design alternatives. It is, however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognises that the consideration of alternatives is an iterative process of feedback between the developer and EAP, which in some instances culminates in a single preferred project proposal.

An initial site assessment was conducted by the developer on the farm Ruimte No. 720 and the farm was found favorable due to its close proximity to grid connections, solar radiation, ecology and relative flat terrain. Where specific features of environmental sensitivity are identified by the independent specialists as part of the Scoping Phase, these areas and the associated required buffers will be considered by the developer to ensure that the facility layout is appropriate considering the sensitive features present. The site selection also took the site geology, land capability, water availability and land use into consideration before deciding on the specific site within the affected property.

The following sections explore different types of alternatives in relation to the proposed activity in more detail.

5.1.1 No-go alternative

This alternative considers the option of 'do nothing' and maintaining the status quo of the affected environment. The description provided in section 5.3 of this report could be considered the baseline conditions (*status quo*) to persist should the no-go alternative be preferred. The site is currently zoned for agricultural land uses. Should the proposed activity not proceed, the site will remain unchanged and will continue to be used for the current land uses present. The area associated with the development footprint has limited agricultural potential and is unsuitable for cultivation, with grazing considered to be the only agricultural option. The potential opportunity costs in terms of alternative land use income through rental for the energy facility and the supporting social and economic development in the area would be lost if the *status quo* persists.

5.1.2 Location alternatives

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity. No other properties have at this stage been secured by Oribi Solar Power Plant (RF) (Pty) Ltd in the Pienaarsriver area to potentially establish the Oribi SPP. From a local perspective the farm Ruimte No. 720 are preferred due to its suitable climatic conditions, topography (i.e. in terms of slope), environmental conditions (i.e. agricultural potential and archaeology), proximity to a grid connection point (i.e. for the purpose of electricity evacuation), as well as site access (i.e. to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase).

Based on the above site-specific attributes, the study area is considered highly preferred in terms of the development of a solar PV facility. As such, no property / location alternatives will be considered (refer to Figure 5.1).

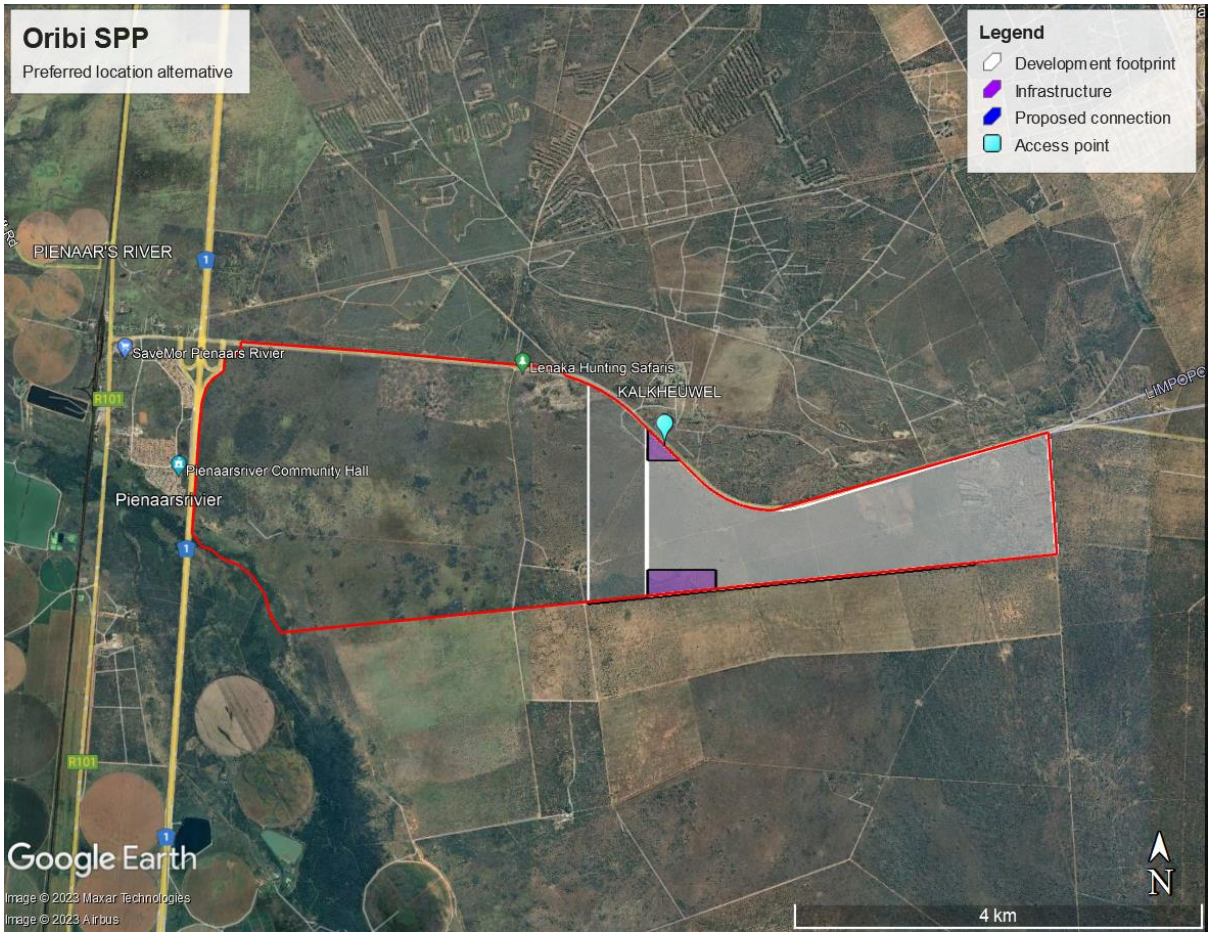


Figure 5.1: Location of the single preferred location alternative

5.1.3 Activity alternatives

The scoping process also needs to consider if the development of a solar PV facility would be the most appropriate land use for the site.

- Photovoltaic (PV) solar facility – Oribi Solar Power Plant (RF) (Pty) Ltd is part of a portfolio of solar PV projects throughout South Africa.
- Wind energy facility - Due to the local climatic conditions a wind energy facility is not considered suitable as the area does not have the required wind resource. Furthermore, the applicant has opted for the generation of electricity via solar power rather than the use of wind turbines based on the renewable energy resource available for the area. This alternative is therefore regarded as not feasible and will not be evaluated further in this report.
- Concentrated solar power (CSP) technology - CSP technology requires large volumes of water, and this is a major constraint for this type of technology considering the water challenges and limitation experienced not only in the country but also within the local area. While the irradiation values are high enough to generate sufficient solar power (refer to Figure 5.2), the water constraints render this alternative not feasible. It must also be noted that the IRP no longer includes the use of CSP as part of the energy mix of the county. Therefore, this alternative will not be considered further in this report.

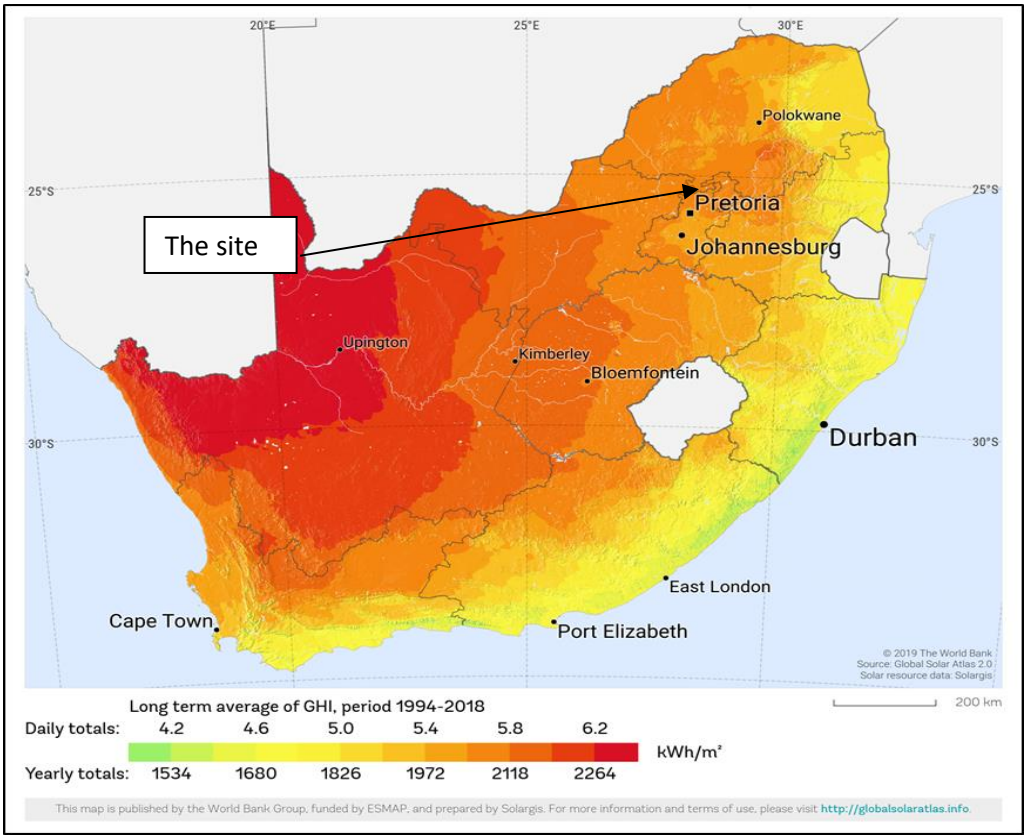


Figure 5.2: Global horizontal irradiation values for South Africa (Solar GIS, 2021) and the Oribi SPP development footprint.

5.1.4 Design and layout alternatives

Design alternatives were considered throughout the planning and design phase (i.e., what would be the best design option for the development?). In this regard discussions on the design were held between the EAP and the developer, which also included the consideration of sensitive environmental areas and features present as identified by the independent specialists that needs to be avoided by the placement of infrastructure. The Final layout plan is included as Figure G, but it should be noted that the final layout plan will be submitted as part of the EIA Report.

The Final layout follows the limitations of the site and aspects such as environmental sensitive areas (depressions and drainage line), roads, fencing and servitudes are considered. The total surface area proposed for layout options include the PV panel arrays spaced to avoid shadowing, access and maintenance roads and associated infrastructure (buildings, power inverters, power lines, BESS and perimeter fences). With regards to the structure orientation, the panels will either be fixed to a single-axis horizontal tracking structure where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture the most sun.

Note: It is customary to develop the final/detailed construction layout of the solar PV facility only once an Independent Power Producer (IPP) is awarded a successful bid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or an alternative programme, after which major contracts are negotiated and final equipment suppliers identified. For the purpose of the Environmental Impact Assessment (EIA), site layout alternatives will not be comparatively assessed,

but rather a single layout will be refined as additional information becomes available throughout the EIA process (e.g., specialist input, additional site surveys, ongoing stakeholder engagement).

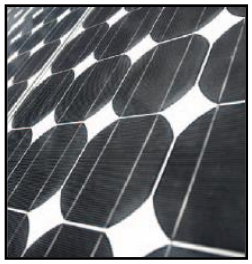
The development area presented in the Scoping Report has been selected as a practicable option for the facility, considering technical preference and constraints, as well as initial No-Go layers informed by specialist site surveys. Following further site screening by the specialists (scheduled to take place during the EIA phase), the development footprint will be finalised for impact assessment.

5.1.5 Technology alternatives

There are several types of semiconductor technologies currently available and in use for PV solar panels. Two, however, have become the most widely adopted, namely crystalline silicon and thin film. These technologies are discussed in more detail below:

- Crystalline (high efficiency technology at higher cost):

  Crystalline silicon panels are constructed by first putting a single slice of silicon through a series of processing steps, creating one solar cell. These cells are then assembled together in multiples to make a solar panel. Crystalline silicon, also called wafer silicon, is the oldest and the most widely used material in commercial solar panels. Crystalline silicon modules represent 85-90% of the global annual market today. There are two main types of crystalline silicon panels that can be considered for the solar facility:

  - Mono-crystalline Silicon - mono-crystalline (also called single crystal) panels use solar cells that are cut from a piece of silicon grown from a single, uniform crystal. Mono-crystalline panels are among the most efficient yet most expensive on the market. They require the highest purity silicon and have the most involved manufacturing process.

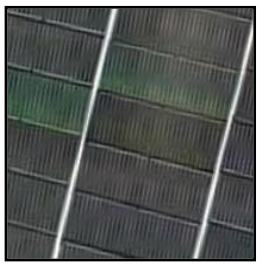
  - Poly-crystalline Silicon – poly-crystalline panels use solar cells that are cut from multifaceted silicon crystals. They are less uniform in appearance than mono-crystalline cells, resembling pieces of shattered glass. These are the most common solar panels on the market, being less expensive than mono-crystalline silicon. They are also less efficient, though the performance gap has begun to close in recent years (First Solar, 2011).

- Thin film (low-cost technology with lower efficiency):

  Thin film solar panels are made by placing thin layers of semiconductor material onto various surfaces, usually on glass. The term *thin film* refers to the amount of semiconductor material used. It is applied in a thin film to a surface structure, such as a sheet of glass. Contrary to popular belief, most thin film panels are not flexible. Overall, thin film solar panels offer the lowest manufacturing costs, and are becoming more prevalent in the industry. Thin films currently account for 10-15% of global PV module sales. There are three main types of thin film used:

- Cadmium Telluride (CdTe) - CdTe is a semiconductor compound formed from cadmium and tellurium. CdTe solar panels are manufactured on glass. They are the most common type of thin film solar panel on the market and the most cost-effective to manufacture. CdTe panels perform significantly better in high temperatures and in low-light conditions.

- Amorphous Silicon - Amorphous silicon is the non-crystalline form of silicon and was the first thin film material to yield a commercial product, first used in consumer items such as calculators. It can be deposited in thin layers onto a variety of surfaces and offers lower costs than traditional crystalline silicon, though it is less efficient at converting sunlight into electricity.



- Copper, Indium, Gallium, Selenide (CIGS) - CIGS is a compound semiconductor that can be deposited onto many different materials. CIGS has only recently become available for small commercial applications, and is considered a developing PV technology (First Solar, 2011).

- <u>Bifacial panels:</u>

  As the name suggests, bifacial solar panels have two faces, or rather, they can absorb light from both sides of the panel. A lot of potential energy transfer is lost in traditional solar cells when the light hits the back of a solar panel. Most bifacial solar panels use monocrystalline cells, whereas traditional cells use polycrystalline materials. The monocrystalline materials, alongside the clear light pathway on both sides of the panel, enable the light to be absorbed from either side of the cell, and it is thought that the overall efficiency of these cells can be up to 30% greater in commercial applications. Although, the exact amount is variable depending on the surface that they are installed on. The front side of the solar panel still absorbs most of the solar light, but the back side of the solar panel can absorb between 5-90% of the light absorbed by the front of the solar panel. Refer to Figure 5.3 for an illustration of Bifacial versus Monofacial Solar Panel absorption.

  Traditional solar panels use an opaque back sheet. By comparison, bifacial solar panels either have a clear/reflective back sheet or have dual panes of glass. Most of these solar panels are frameless so any issues with potential-induced degradation (PID) are reduced. To efficiently convert light into electricity from both sides, bifacial solar cells have selective-area metallization schemes that enable light to pass between the metallized areas, rather than the conventional thick metal collectors as seen with monofacial solar panels.

  The technology that (at this stage) proves to be most feasible and reasonable with respect to the proposed solar facility is crystalline silicon panels, due to it being non-reflective, more efficient, and with a higher durability. However, due to the rapid technological advances being

made in the field of solar technology the exact type of technology to be used, such as bifacial panels, will only be confirmed at the onset of the project.

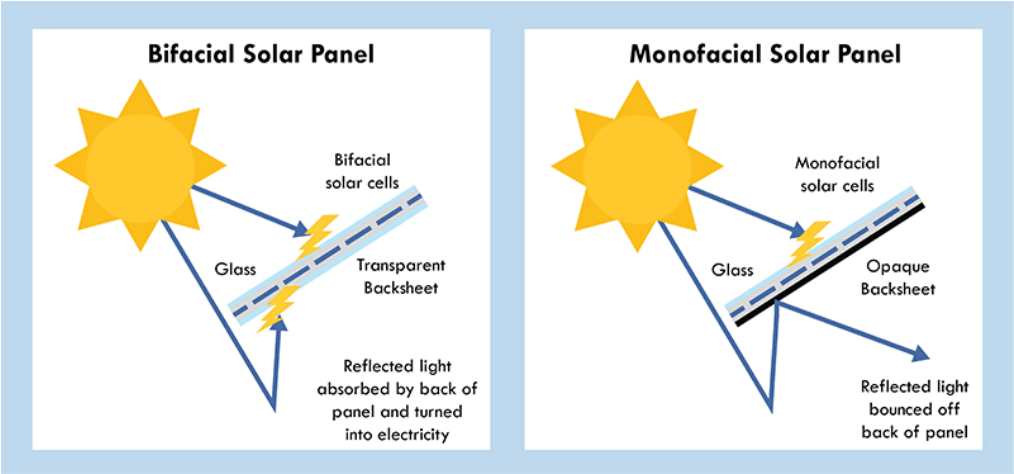


Figure 5.3: Bifacial vs Monofacial Solar Panel absorption.

5.2 PUBLIC PARTICIPATION PROCESS

The following sections provide detailed information on the public participation process conducted in terms of Regulations 39 to 44. The following three categories of variables were taken into account when deciding the required level of public participation:

- The scale of anticipated impacts;
- The sensitivity of the affected environment and the degree of controversy of the project; and
- The characteristics of the potentially affected parties.

Since the scale of anticipated impacts is low, the general land use of the area is related to mining and agriculture, the limited environmental sensitivity of the site and the fact that no conflict was foreseen between potentially affected parties, no additional public participation mechanisms are considered at this stage of the process. The following actions have already been undertaken:

➢ Newspaper advertisement

Since the proposed development is unlikely to result in any impacts that extend beyond the municipal area where it is located, it is deemed sufficient to advertise in a local newspaper. An advertisement will be placed in English in the local newspaper (The Post) on the 10 February 2023 (see Appendix C1) notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with and submit their comments to Environamics Environmental Consultants. I&APs was given the opportunity to raise comments within 30 days of the advertisement (by 13 March 2023).

➢ Site notices

Site notices were placed on site in Afrikaans and English on 6 February 2023 to inform surrounding communities and immediately adjacent landowners of the proposed development. I&APs were given the opportunity to raise comments by 8 March 2023. Photographic evidence of the site notices is included in Appendix C2.

- Direct notification of identified I&APs

  Identified I&APs, including key stakeholders representing various sectors, will be directly informed of the EIA process on 23 February 2023 via registered post, telephone calls, WhatsApps and emails (as relevant). The Background Information Document (BID) was distributed with the notification. For a complete list of I&APs with their contact details see Appendix C3 to this report. It was expected from I&APs to provide their inputs and comments by 27 March 2023.

- Direct notification of surrounding landowners and occupiers

  Written notices were also provided via registered post, WhatsApp or email (as relevant) to all surrounding landowners and occupiers on 23 February 2023. The surrounding landowners were given the opportunity to raise comments within 30 days. For a list of surrounding landowners see Appendix C3.

- Circulation of Final Scoping Report

  Copies of the Final Scoping report has been provided to all I&APs via courier, Dropbox, company website and/or email (as relevant). Hard copies of the report will be made available on request and where an I&AP does not have the resources to view the report on an online platform. I&AP's and organs of state will be requested to provide their comments on the report until 22 June 2023. The comments will be documented and compiled into a Comments and Response Report to be included as part of the Final Scoping Report for decision-making.

5.2.1 Consultation process

Regulation 41 requires that the landowner, surrounding landowners, municipality, relevant ward councillor, any organ of state having jurisdiction in respect of any aspect of the activity should be given written notice of the activity. A complete list of all the consultees who received written notice as well as proof of correspondence is attached as Appendices C4 and C5. Refer to Figure 5.4 for the location of the surrounding land owners.

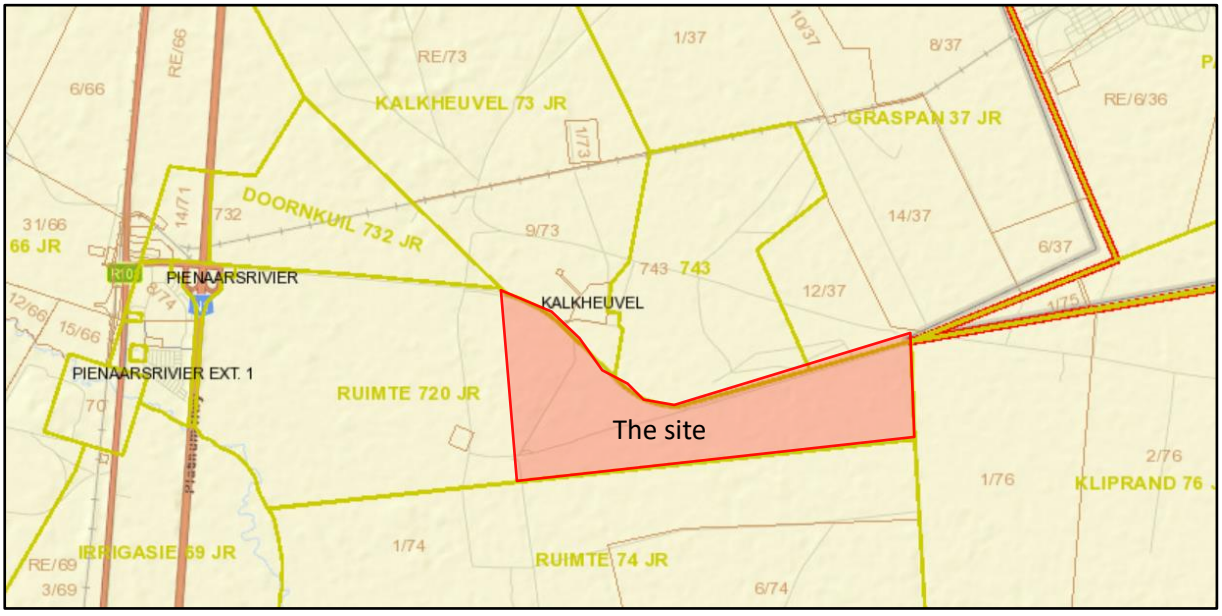


Figure 5.4: Location of the surrounding landowners (Chief Surveyor General database).

5.2.2 Registered I&APs

I&APs include all stakeholders who deem themselves affected by the proposed activity. According to Regulation 43(1) "*A registered interested and affected party is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application*."

This report is the Final Scoping Report which will be made available to all potential and/or registered I&APs and State Departments. They will be provided with a copy of the Final Scoping Report and will be requested to provide written comments on the report within 30 days. All issues identified during the review period will be documented and compiled into a Comments and Response Report to be included as part of the Final Scoping report.

All comments received prior to the release of the Final Scoping Report for the 30-day review and comment period have been included in this report as Appendix C4, Appendix C5 and Appendix C6 to provide I&APs an opportunity to confirm that their comments raised during the initial public participation phase has been included and considered as part of the EIA process.

5.2.3 Issues raised by I&APs and consultation bodies

To date the interim comments from Eskom and SAHRA have been received and is summarised in the Comments and Response Report included in Appendix C6. Any comments received during the circulation of the Final Scoping Report will be summarised in the final Scoping Report. The full wording and original correspondence are included in Appendix C5.

5.3 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE PREFERRED ALTERNATIVE

The following sections provide general information on the biophysical and socio-economic attributed associated with the preferred alternative (i.e., the location of the development footprint within the affected property).

5.3.1 Biophysical environment

The biophysical environment is described with specific reference to geology, soils, agricultural potential, vegetation and landscape features, climate, biodiversity, heritage features (in terms of archaeology and palaeontology), the visual landscape and the social environment to be affected. A number of specialists were consulted to assist with the compilation of this chapter of the report – refer to the Table 1.2.

The surrounding land uses include residential area, crop fields and farming activities. The area proposed for development (i.e., the development footprint) exclusively consists of land used for grazing, therefore limited sensitive areas from an ecological, heritage or conservation point have been identified apart from the two depressions and the drainage line. These features are described in more detail below.

5.3.1.1 Geology, soils and agricultural potential

According to the Soil and Agricultural Potential Assessment (attached in Appendix E4), the project area falls within the Ae 20 land type. The Ae 20 land type is predominated by Hutton, Calorifier and Sterkspruit soil forms with also the occurrence of other soils occurring throughout the terrain, following the South African soil classification working group. The Ae 20 land type is also characterised by freely drained red apedal soils with a high base status. The geology of Ae 20 land type includes siltstone, sandstone and shale of the Irrigation Formation.

Agricultural potential is determined by a combination of soil, terrain and climate features. The land capability is determined by the physical features of the landscape including the soils present. The agricultural potential is determined by combining the land capability results and the climate capability for the region. The above-mentioned soil forms have been determined to have a land capacity class of “III” and “VI” with a climate capacity level 8 given the Low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates. The combination between the determined land capability class and climate capability results in land potential “L5”. The “L5” land potential level is characterised by restricted land potential due to the regular and/or severe to moderate limitations as a result of the soil, slope, temperature, or rainfall. This area is non-arable, and it is characterised with a “Moderately Low” sensitivity. The proposed Oribi Solar Power Plant project is characterised with “Low to Very High” land capability sensitivity (refer to Figure 5.5). Furthermore, field crops with high potential were also identified within the proposed project area according to the DEA (2023) (refer to Figure 5.6). However, the information gathered from the site sensitivity verification indicated a “Moderately Low” land capability sensitivity which results into a “Low” land potential. The land capability and land potential of the resources in the regulated area, according to the site sensitivity verification are both characterised by “Low” sensitivities, which conforms to the requirements of an agricultural compliance statement only.

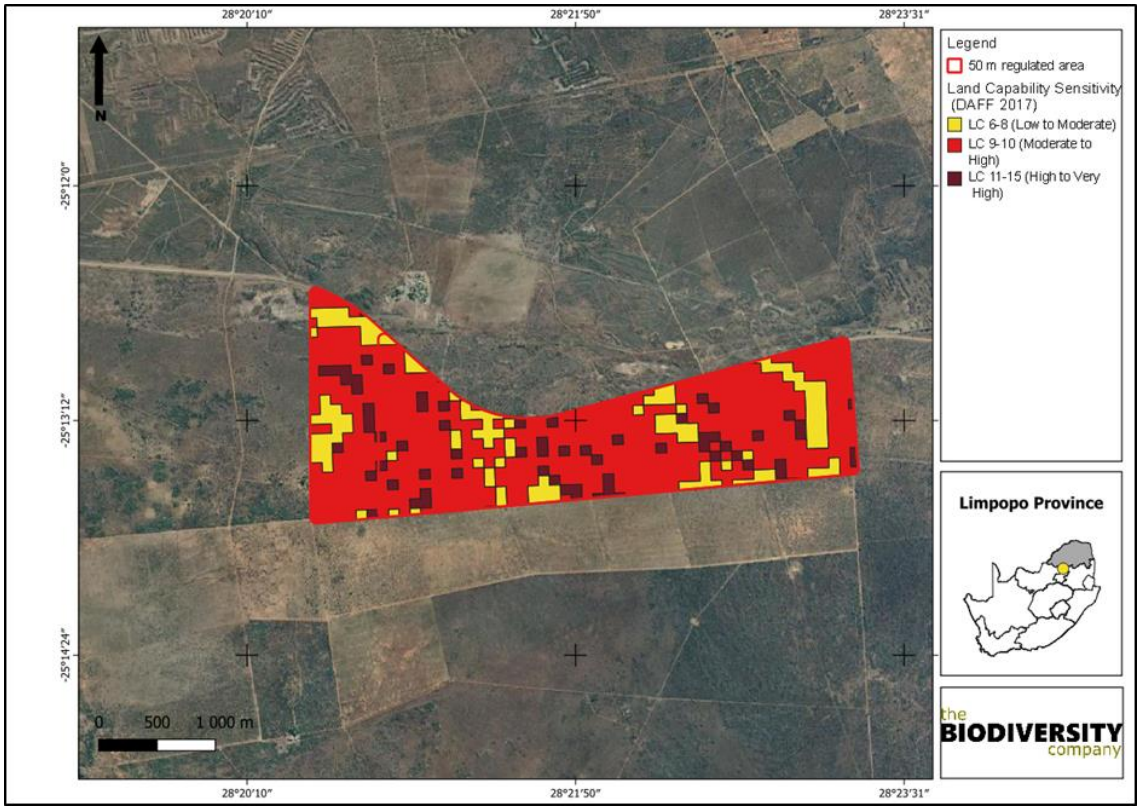


Figure 5.5: The land capability sensitivity (DAFF, 2017)

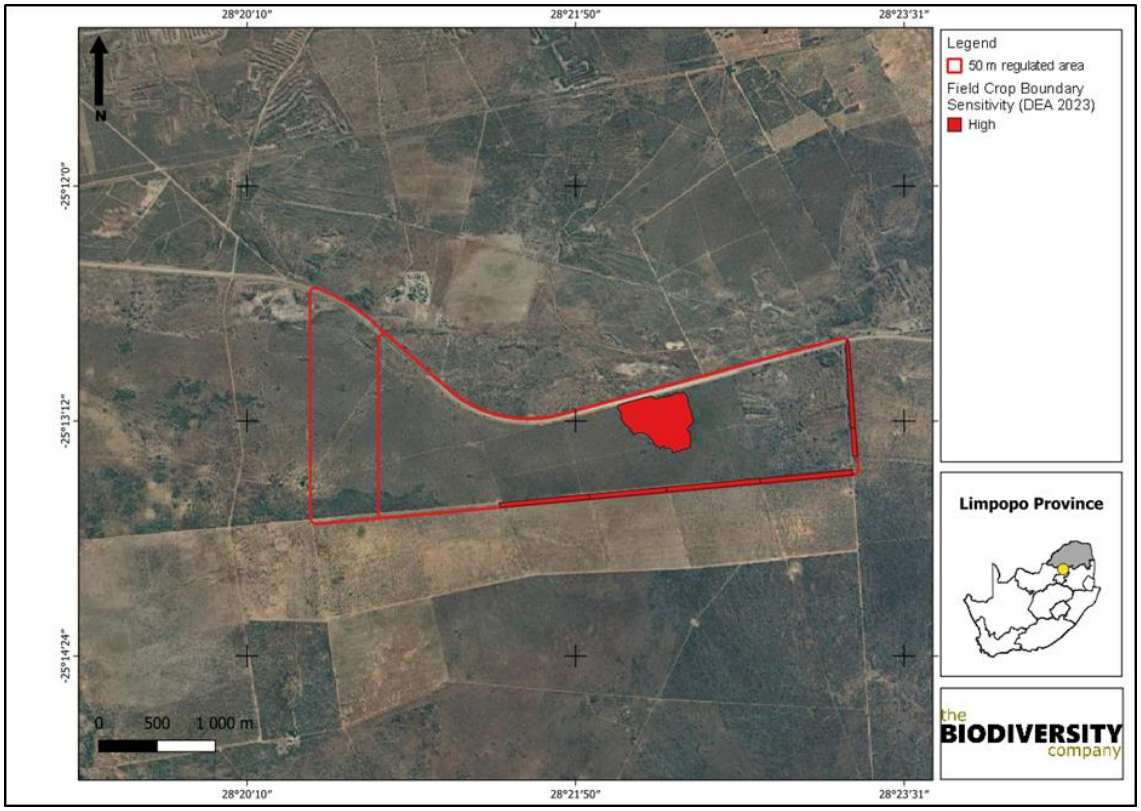


Figure 5.6: Crop boundary sensitivity (DEA Screening Tool, 2022)

5.3.1.2 Vegetation, topography and landscape features

According to the Terrestrial Ecology Baseline and Impact Assessment (attached as Appendix E1), the project area is situated within the Savanna biome. The Savanna vegetation of South Africa represents the southernmost extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Most savanna vegetation communities are characterised by a herbaceous layer dominated by grasses and a discontinuous to sometimes very open tree layer (Mucina & Rutherford, 2006). The savanna biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. Savannas are characterised by a dominant grass layers, over-topped by a discontinuous, but distinct woody plant layer.

The project area is situated within the Sprinbokvlakte Thornveld. This vegetation type occurs on flat to slightly undulating plains where it is comprises of open to dense, low thorn savanna dominated by *Vachellia* and *Senegalia* species or shrubby grassland with a very low shrub layer. Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006). The following species are important in the Springbokvlakte Thornveld.

Small Trees: *Vachellia karroo*, *V. luederitzii* var. *retinens*, *Senegalia mellifera* subsp. *detinens*, *Vachellia nilotica*, *Ziziphus mucronata*, *Vachellia tortilis* subsp. *heteracantha*, *Boscia foetida* subsp. *rehmanniana*.

Tall Shrubs: *Euclea undulata*, *Searsia engleri*, *Dichrostachys cinerea*, *Diospyros lycioides* subsp. *lycioides*, *Grewia flava*, *Tarchonanthus camphoratus*.

Low Shrubs: *Vachellia tenuispina*, *Ptycholobium plicatum*.

Succulent Shrub: *Kleinia longiflora*.

Herbaceous Climbers: *Momordica balsamina*, *Rhynchosia minima*.

Graminoids: *Aristida bipartita*, *Dichanthium annulatum* var. *papillosum*, *Ischaemum afrum*, *Setaria incrassata*, *Aristida canescens*, *Brachiaria eruciformis*.

Herbs: *Aspilia mossambicensis*, *Indigastrum parviflorum*, *Nidorella hottentotica*, *Orthosiphon suffrutescens*, *Senecio apiifolius*.

Biogeographically Important Taxon (Central Bushveld endemic)

Graminoid: *Mosdenia leptostachys*.

According to Mucina and Rutherford (2006), the Springbokvlakte Thornveld vegetation type is classified as Endangered. Only 1% is statutorily conserved, mainly in the Mkombo Nature Reserve. At least 49% transformed, including about 45% cultivated and 3% urban and built-up. Dense rural populations occur in parts of the southern and eastern side of the unit. The Plants of South Africa (POSA) database indicates that over 400 species of plants could be expected to occur within and around the project area. One (1) of the expected species is classified as Species of Conservation Concern (SCC), based on its conservation status, namely *Cullen holubii.* During the field survey, one Hundred and twenty (120) species of plant were noted as being prominent in the landscape, 108 of

these species being 'indigenous'. Figure 5.7 illustrates some of the species observed within the project area.

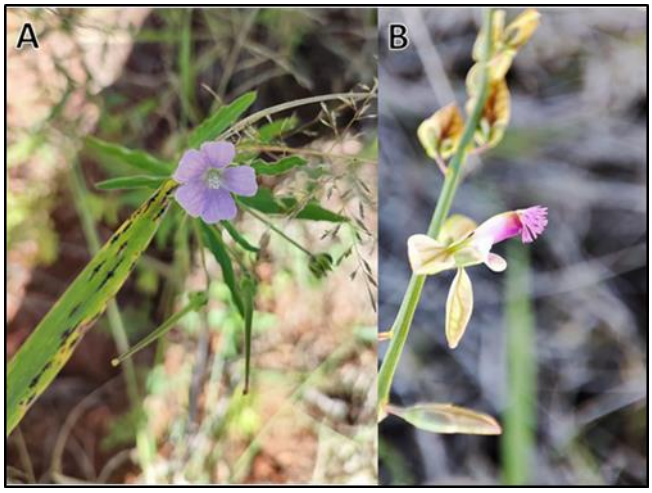


Figure 5.7: Photographs illustrating some of the indigenous flora species recorded – A) *Monsonia angustifolia*, B) *Polygala hottentotta*

With regards to alien invasive plant species (AIP), twelve (12) IAP species were recorded during the field survey, eleven (11) of which are Category 1b species which must be controlled through the implementation of an IAP Management Programme. Photographs of some the observed IAP species are presented in Figure 5.8 below.

Figure 5.8: Photographs illustrating the Queen of the Night catus (Cereus jamacaru) found during the field assessment

Protected Areas, Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA)

The proposed site falls within the Limpopo Province and as such their bioregional plan is applicable. Critical Biodiversity Areas (CBAs) are areas that are required to meet the regions biodiversity targets and there are no, or very few, other options available in the landscape to meet these targets. Such sites therefore need to remain in a largely natural state and land management objectives require that these areas are managed for no further degradation and that degraded areas are rehabilitated.

Ecological Support Areas (ESAs) are important for maintaining ecological processes on which CBAs depend and are important in delivering ecosystem services. These areas should remain in a largely functional state and land management objectives should support ecological processes. The project site overlaps with areas classified as CBA1, ESA2 and NNR (refer to Figure 5.9). The majority of the site is listed as a CBA1 category.

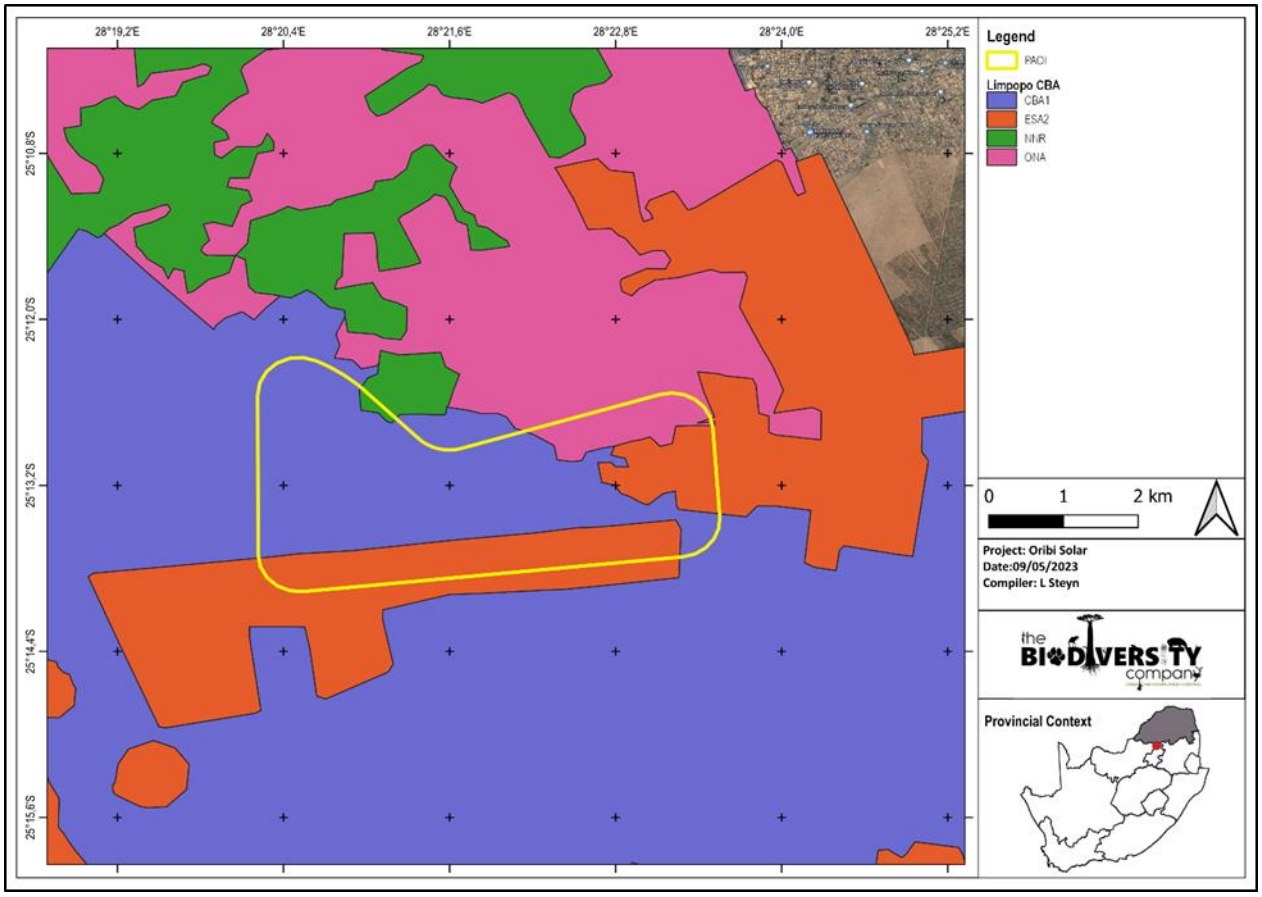


Figure 5.9: Map illustrating the Limpopo CBA and ESA map dataset relevance

According to the 2018 NBA spatial dataset the PAOI overlaps with a 'Vulnerable' ecosystem as well as a 'Poorly Protected' ecosystem. An 'Vulnerable' ecosystem type is one which is considered to be at high risk of collapse (SANBI, 2019). 'Poorly Protected' ecosystems are those which have between five and 50% of their biodiversity target included in one or more protected areas and a 'Not Protected' ecosystem type are those that has less than 5% of its biodiversity target included in one or more protected areas (SANBI, 2019).

The PAOI overlap with NPAES priority areas, as illustrated in Figure 5.10. These areas are often large portions of undeveloped natural land occurring within important ecosystem types.

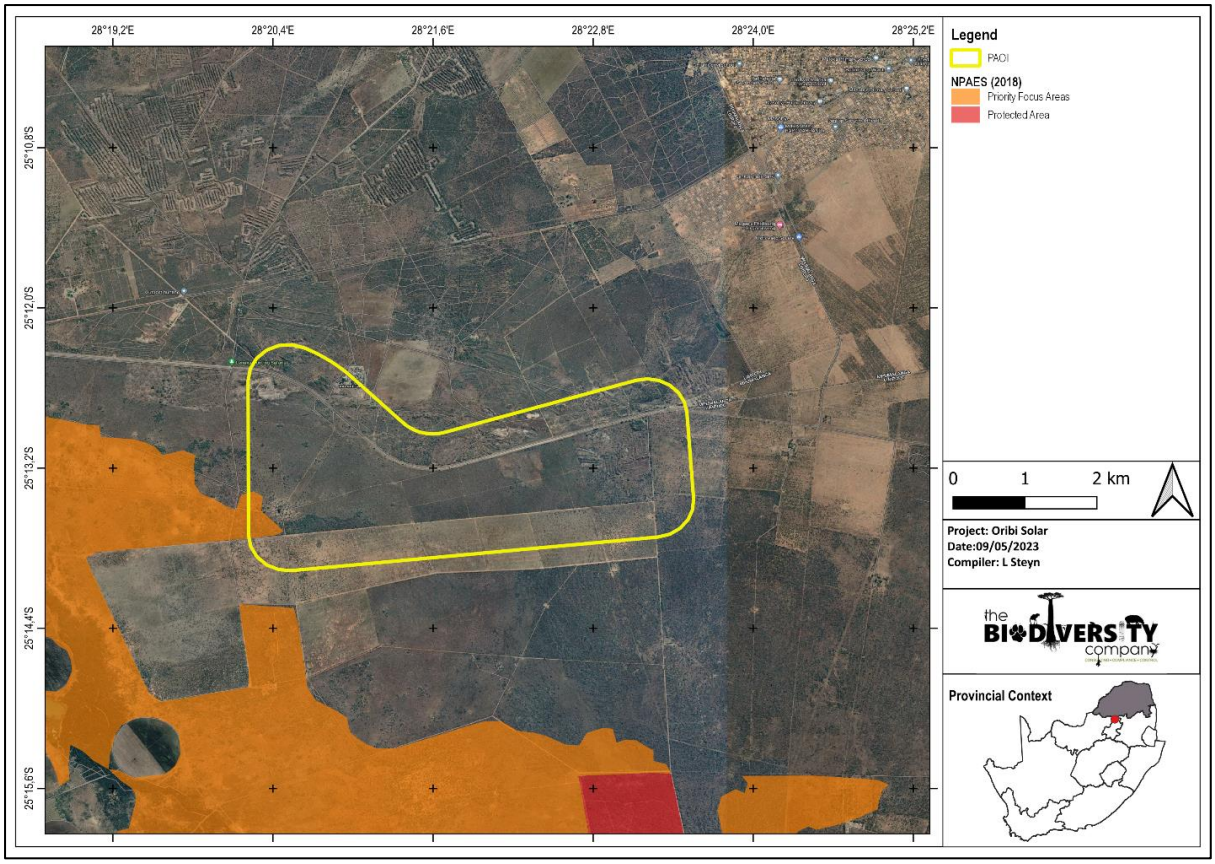


Figure 5.10: Map illustrating the PAOI location in relation to the NPAES dataset

According to the protected area spatial datasets from SAPAD (2022) and SACAD (2022), the PAOI is the project area is located within 5 km of a number of protected areas (Figure 5.11).

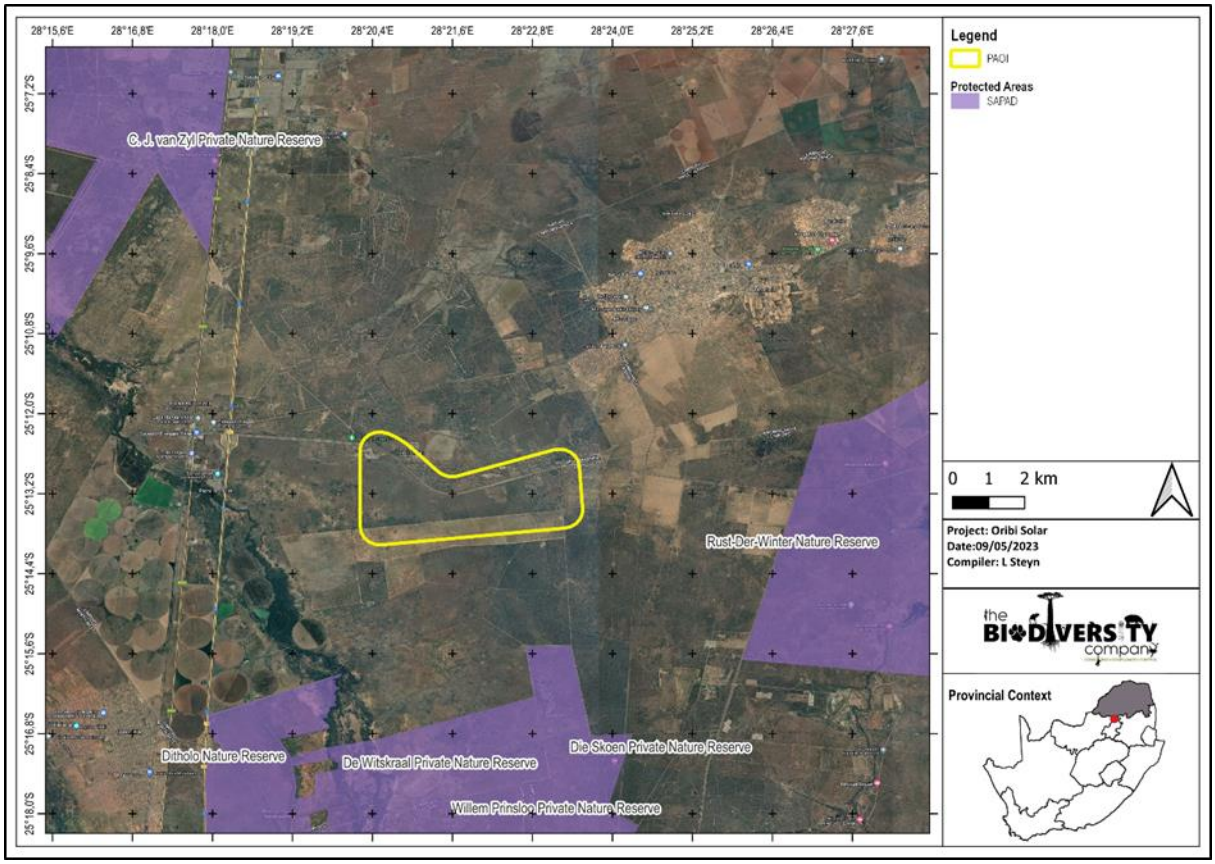


Figure 5.11: The PAOI in relation to the protected areas

According to the SAIIAE database, the PAOI borders is 2.5 km from the closest river, the Pienaars river No FEPA wetlands or rivers can be found in the project area.

5.3.1.3 Wetlands and Riparian Features

Wetland Baseline and Risk Assessment (attached as Appendix E3) states that according to the National Biodiversity Assessment (NBA) 2018 and NWM5, no wetlands are expected to overlap with the 500m regulatory area. However, two different HGM units were identified within the project area and were classified as two different depressions. The depressions were labelled as depression 1 (D1) and depression 2 (D2) and were assessed as two different units. Along with the two depressions a single a drainage line was also delineated within the project area (see Figures 5.12 & **Error! Reference source not found.**5. 13).

Drainage features (or lines) were also identified for the eastern catchment the project area. These features are referred to as 'A' Section channels that convey surface runoff immediately after a storm event and are not associated with a baseflow (DWAF, 2005).

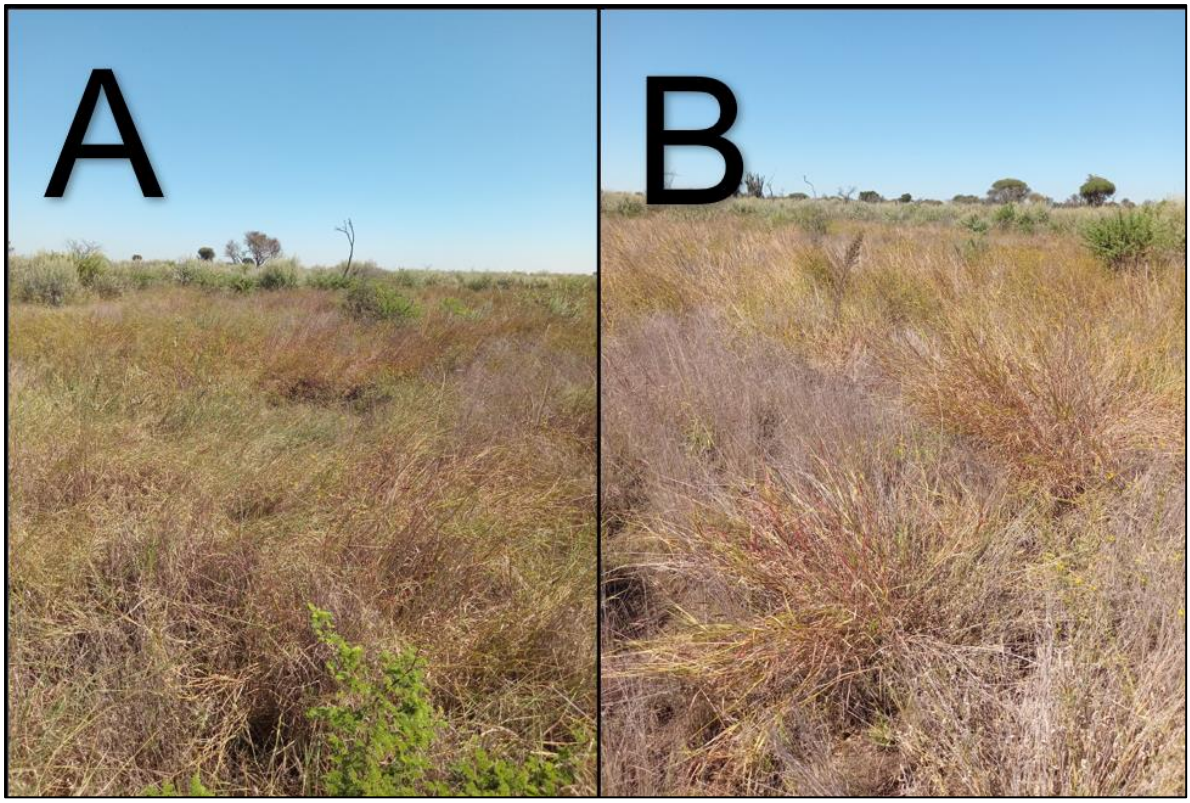


Figure 5.12: Photographs showing the different wetlands delineated within the project area of influence, A) Depression 1., B) Depression 2

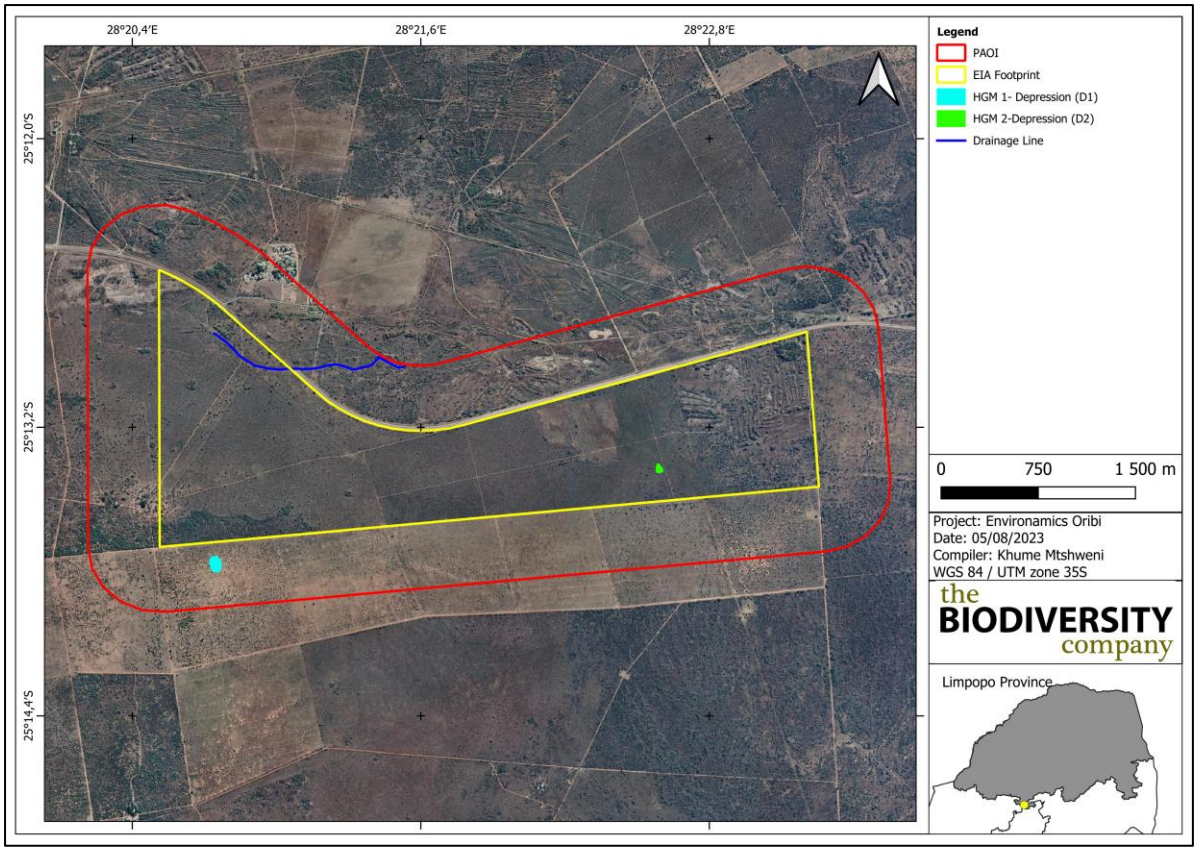


Figure 5.13: Delineation of wetlands within project area of influence

The results of the ecological IS assessment are shown in Table 5-1. Various components pertaining to the protection status of a wetland are considered for the IS, including Strategic Water Source Areas (SWSA), the NFEPA wetland vegetation (wet veg) threat status and the protection status of the wetland. The IS for all the wetlands have been calculated to be "Moderate", which combines the relatively "High" threat status and the low protection levels of the wetland.

Table 5-1 The IS results for the delineated HGM units

HGM Type	NFEPA Wet Veg			NBA Wetlands			SWSA (Y/N)	Calculated IS
	Type	Ecosystem Threat Status	Ecosystem Protection Level	Wetland Condition	Ecosystem Threat Status 2018	Ecosystem Protection Level		
Depression	Central Bushveld Group 1	Endangered	Not Protected	A/B Largely Natural	Least Concern	Poorly Protected	N	**Moderate**

A pre-mitigation buffer zone for the PV development of 32 m is recommended for the identified wetlands, which can be decreased to 26 m with the addition of all prescribed mitigation measures.

5.3.1.4 Climate

The vegetation type is characterised by a summer rainfall with a Mean Annual Precipitation (MAP) of 630 mm (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna biome include:

a) Seasonal precipitation; and

b) (Sub) tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006).

5.3.1.5 Biodiversity

The primary cause of loss of biological diversity is habitat degradation and loss (IUCN, 2004; Primack, 2006). In the case of this study special attention was given to the identification of sensitive species or animal life and birds on site. The following section will discuss the state of biodiversity on the site in more detail.

<u>Avifaunal</u>

According to the Avifaunal Scoping Assessment (Appendix E2), 408 avifauna species are expected for the PAOI and surrounds. Of these, 28 are considered Species of Conservation Concern (SCC). Four habitat types were delineated within the Project Area, namely Bushveld, Degraded Bushveld, degraded Bushveld and Modified habitat (refer to Table 5.3).

Table 5-2 Habitat types identifies during the initial site survey

Habitat	Description	SCC possibly occurring there	Photographs
Bushveld	Bushveld System	*Gyps africanus, Gyps coprotheras, Coracias garrulus, Leptoptilos crumenifer, Aquila rapax*	
Degraded Bushveld	Bushveld System	*Falco biarmicus, Gyps africanus, Gyps coprotheras, Coracias garrulus, Leptoptilos crumenifer, Aquila rapax, Circus macrourus*	
Degraded Grassland	Grassland and savannah systems with some evidence of past or current agricultural activities.	*Sagittarius serpentarius, Falco vespertinus, Falco biarmicus, Glareola nordmanni, Ciconia abdimii, Leptoptilos crumenifer, Circus ranivorus, Polemaetus bellicosus*	
Modified	Homesteads and associated infrastructure as well as prominent roads and disturbed areas	None	

Their respective SEI and the corresponding mitigation guidelines are visually illustrated in Figure 5.14.

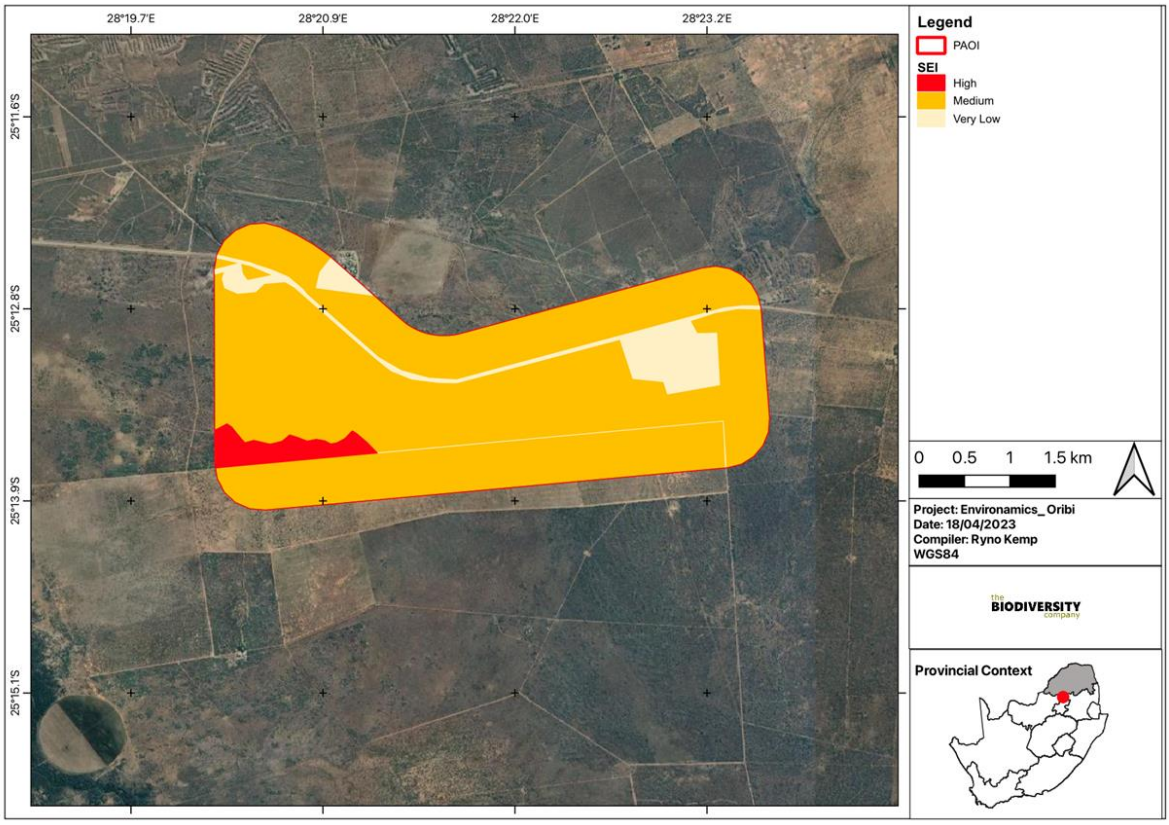


Figure 5.14: Map illustrating the Avifauna Site Ecological Importance (SEI) for the proposed Solar Power Plant (SPP) Project Area

Fauna

The main habitat types identified across the project area were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Six (6) habitats were delineated in total, and the sensitivity of these habitats are mapped over the entire project area in **Error! Reference source not found.**.15 below. Table 5.3 provides a summary of the habitats observed in the PAOI.

Table 5-3 Summary of habitat types delineated within the Project Area of Influence

Habitat Type	Description	Habitat Sensitivity
Turf veld	Black Turf soils supporting stunted microphyllous thorny species. Topography is flat. *Bothriochloa insculpta* is the dominant graminoid.	High
***Vachellia luederitzii* veld**	A vegetation community dominated by *Vachellia luederitzii* with a closed woodland structure.	High
Vaalbos veld	A large open area which appears to have had large scale poison historically applied. It is dominated by the shrub *Tarchonanthus camphoratus*.	Medium
Open savanna veld	Plains with an open savanna structure scattered with large trees and Shrubs.	Medium
***Vachellia karroo – Cenchrus ciliaris* veld**	A closed woodland consisting of *Vachellia karroo* and *Cenchrus ciliaris.*	Medium
Disturbed veld	Undulating hills and depressions created through excavation and dumping. Large trees scattered throughout. Herbaceous layer is well developed.	Low

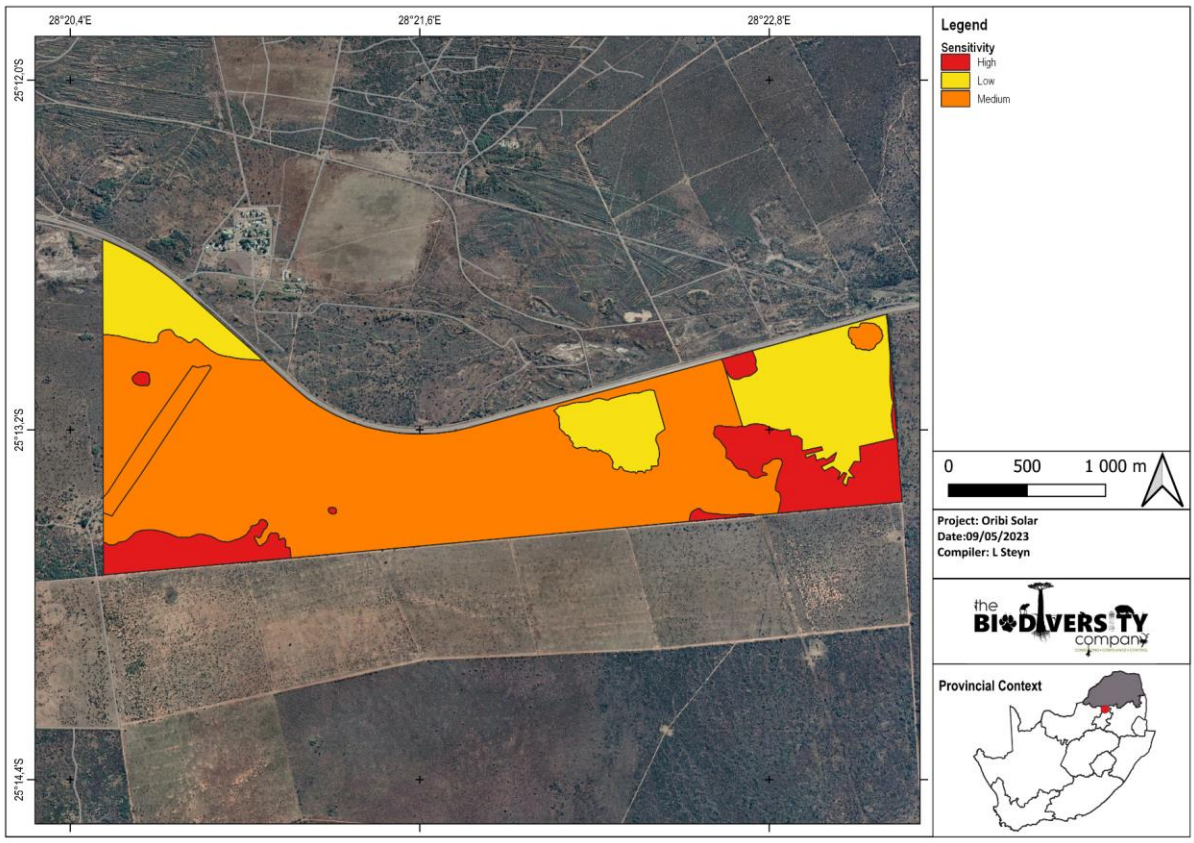


Figure 5.15: Map illustrating the sensitivities of the habitats delineated within the overall Project Area of Influence

The IUCN Red List spatial database, in addition to the MammalMap database, lists 92 mammal species that could be expected to occur within and around the PAOI. Seventeen (17) of these expected species are regarded as SCC (**Error! Reference source not found.**), and of these SCC three (3) have a moderate-high likelihood of occurrence based on the presence of suitable habitat and food sources in the area.

Over 89 reptile species may be expected to occur within and nearby to the project area. Three (3) of these species are regarded as SCC, and one (1) are assigned a moderate likelihood of occurrence 20 amphibian species are expected to occur within the area. One (1) is regarded as threatened. Due to a river and wetlands present within the vicinity of the project area the likelihood of occurrence is rated as moderate. Based on the IUCN Red List spatial database and FrogMap, 31 amphibian species may be expected to occur within and nearby to the project area. One (1) of these is regarded as an SCC and it is assigned a moderate likelihood of occurrence due to the presence of some suitable wetland habitat

During the fauna survey, six (6) mammal species were recorded, and one (1) herpetofauna species was observed during the survey. All of the observed faunal species have a conservation status of 'least concern' – refer to Table 5.4. A larger number of mammal and herpetofauna species are expected to occur in the area, and longer-term multi-season surveys would be required in order to ensure sufficient sampling.

Table 5-4: The fauna species recorded during the field survey

Species	Common Name	Conservation Status	
		SANBI (2023)	IUCN (2023)
Aepyceros melampus	Impala	LC	LC
Cynictis penicillata	Yellow Mongoose	LC	LC
Herpestes sanguineus	Slender Mongoose	LC	LC
Lepus saxatilis	Scrub Hare	LC	LC
Phacochoerus africanus	Common Warthog	LC	LC
Xerus inauris	South African Ground Squirrel	LC	LC

The relative terrestrial biodiversity theme sensitivity as indicated by the screening tool report for the overall PAOI was derived to be 'Very High', due to the presence of CBA1, ESA1, and vulnerable ecosystem areas. The allocated sensitivities for each of the relevant themes are either disputed or validated for the overall project area in Table 5.5 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species.

Table 5-5: Summary of the screening tool vs specialist assigned sensitivities

Screening Tool Theme	Screening Tool	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	**Low-Medium**	**Medium**	Validated– Habitat is generally intact. SCC may forage in specific areas, some areas are used as vital for lifecycles.
Plant Theme	**Medium**	**Medium**	Validated – There is a medium diversity of plant species. No SCC were recorded but there is potential for them to occur.
Terrestrial Theme	**Very high**	**High-Medium**	Disputed – Certain habitat sensitivities are regarded as high, while others are medium and low. Minimal habitat fragmentation was present. Although large scale clearing through either mechanical deforestation or arboricide application was evident.

5.3.1.6 Visual landscape

The Visual Impact Assessment (attached as Appendix E8) state that visual receptors can be defined as "*individuals, groups or communities who are subject to the visual influence of a particular project*". Possible visual receptors identified within the 10km radius landscape, which due to its land use could be sensitive to landscape change. They include:

- **Area Receptors** which include:
  - A large number of surrounding communities.
  - Dinokeng Nature Reserve.
  - Rust de Winter Nature Reserve.
  - Pienaarsrivier.
  - C.J. van Zyl Private Nature Reserve.
- **Linear Receptors** which include:
  - N1 National Road.
  - D205 district road.

- R101 regional road (also known as the old Pretoria to Warmbad road).

- **Point Receptors** which include:
  - Homesteads on farms.
  - Lodging facilities (mainly private lodging facilities within nature reserves).
  - Kalkheuwel.

Refer to Figure 5.16 for the Zone of Theoretical Visibility (ZTV). These maps indicate all areas that are in direct line of site of the proposed development up to a distance of 10km.

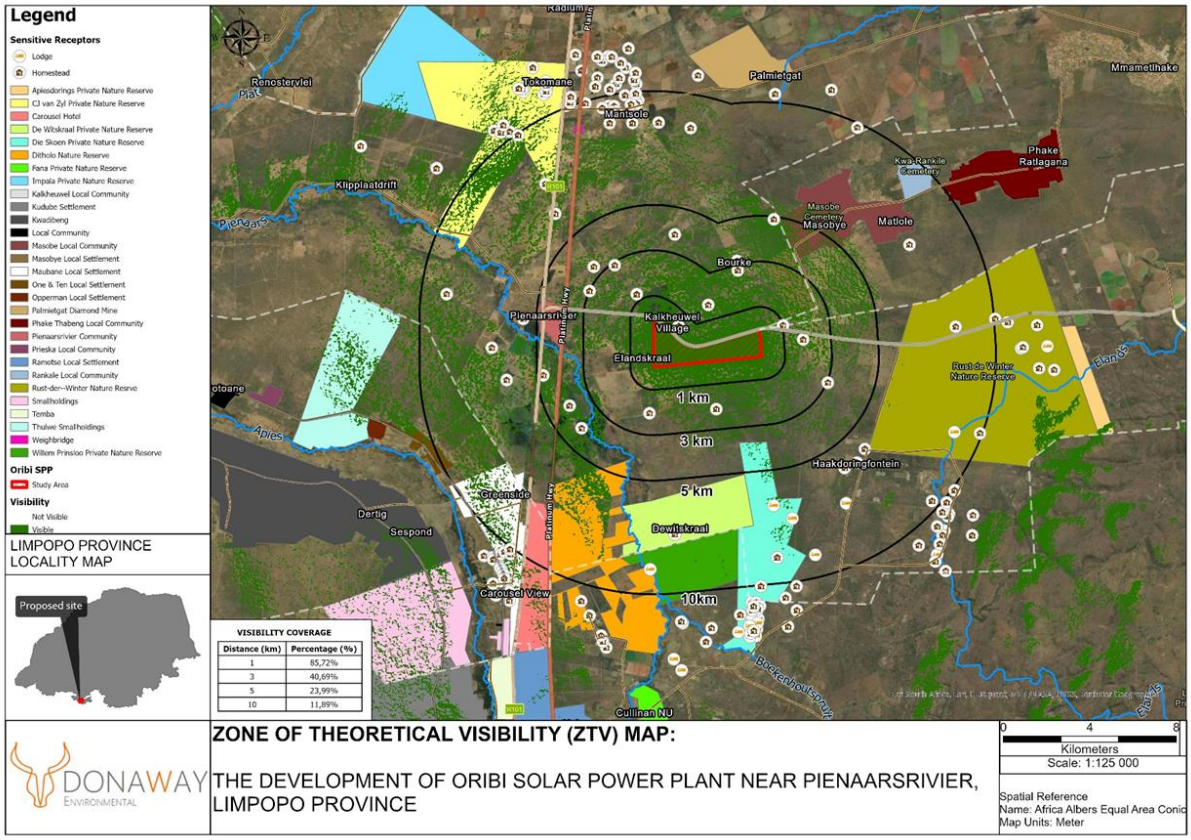


Figure 5.16: Zone of Theoretical Visibility (ZTV) for the SPP, Satellite View.

Table 5.5 below reflects the visibility rating in terms of proximity on sensitive receptors of the SPP.

Table 5.6: ZTV Visibility Rating in terms of Proximity to the SPP.

Radius	Visual Receptors	Visibility rating in terms of proximity
0-1km	- One homestead on a farm - Kalkheuwel private community - D205 district road **Visibility Coverage: 85.72%**	Very High
1-3km	- Seven homesteads on farms - D205 district road	High

	- Masobe community **Visibility Coverage: 40.69%**	
3-5km	- Eight homesteads on farms - N1 National Road - R101 regional road - D205 district road - Masobe community - Dinokeng Nature Reserve **Visibility Coverage: 23.99%**	Medium
5-10km	- Eight homesteads on farms - Three lodging facilities - N1 National Road - R101 regional road - Masobe community - Maubane community - The Carousel Casino - Dinokeng Nature Reserve - C.J. van Zyl Private Nature Reserve **Visibility Coverage: 11.89%**	Low

Please Note: The ZTV assessment did not consider existing screening such as buildings and vegetation cover but rather the terrain's above mean sea level (AMSL) which indicates line of sight.

Referring to the assessment score of this VIA report review, the significance of the visual impact will be a "Negative Low Impact" after mitigation. The only receptors likely to be impacted by the proposed development are the nearby property owners and nearby roads. However, a large part of the visual landscape is still reflecting an agricultural landscape with a better visual appearance.

It is believed that renewable energy resources are essential to the environmental well- being of the country and planet (WESSA, 2012). Aesthetic characteristics are subjective, and some people find solar facilities and their associated infrastructure pleasant and optimistic while others may find it visually invasive; It is mostly perceived as symbols of energy independence, and local prosperity. The visual impact is also dependant on the land use of an area and the sensitivity thereof in terms of visual impact, such as protected areas, parks and other tourism related activities. Considering all positive factors of such a development including economic factors, social factors and sustainability factors, especially in a semi-arid country, the visual impact of this proposed development will be insignificant and is suggested that the development commence, from a visual impact point of view.

5.3.1.7 Traffic consideration

According to the Traffic Impact Assessment (Appendix E9), the existing external road network, in the vicinity of the Oribi SPP is:

- The *N1* is a surfaced, two-lane roadway with wide shoulders and is classified as a Class R1

Rural Principal Arterial in the vicinity of the proposed development site. The road serves as the major north-south route across South Africa, connecting Cape Town (in the south) and Beit Bridge (in the north) and is approximately 2 000km long.

- The *R101* is a two lane, two-way roadway with wide shoulders and is classified as a Class 3 Rural Minor Arterial in the vicinity of the proposed development site. This road operates parallel to the N1 (to the west) and serves to connect the northern Johannesburg suburbs (Sandton) with Polokwane.

- *Rust de Winter Road* (D262) is a two lane, two-way roadway and is classified as a Class 4 Rural Collector Road in the vicinity of the proposed development site. This roadway primarily serves to connect individual properties / small settlements to the adjacent higher order road network. This road has a posted speed limit of 100 km / hr in the vicinity of the proposed site.

It should be noted that the majority of the other roads surrounding the proposed project site are unsurfaced (i.e., gravel or sand-based) roadways classified as Class 5 Local Roads and primarily fulfil an access function for the neighbouring farms.

There are a number of existing farm access roads located to the north and south of the D262, in the vicinity of the proposed Oribi PV SPP site. Access to the Oribi PV SPP site is proposed via a single new roadway that connects to the external road network to the south of the D262 as shown in Figure 5.17. It should be noted that as this is a new access road, it will have to be formalised and upgraded to the minimum standards as detailed in *the* TIA. This may likely be a requirement as part of the wayleave application approval of the *Bela-Bela Local Municipality*, *Waterberg District Municipality* and *Limpopo Department of Roads and Transport*.

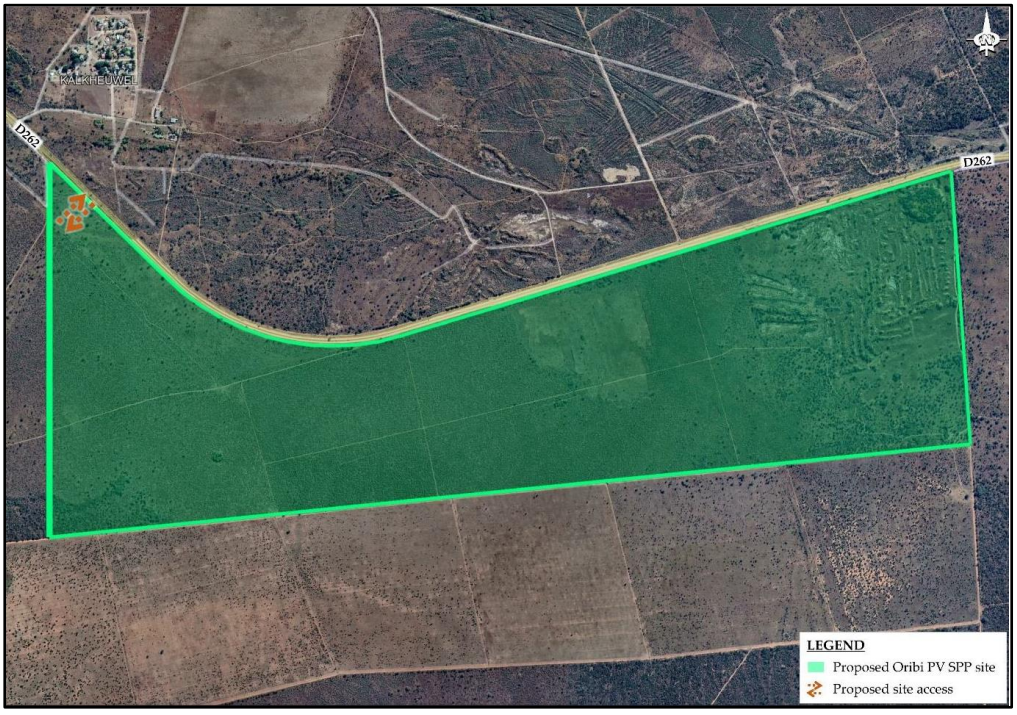


Figure 5.17: Proposed site accesses

The initial technical information received indicates that the site will have an internal road network

with proposed roadway widths of between 4 m and 6 m. This is considered acceptable and a gravel road structure would be suitable for this development. The total length of the internal road network is estimated at 12.8 km.

Two (2) possible ports of entry have been identified from where the solar panel technology and large electrical components will be transported, namely: Durban and Richards Bay. The distance from Durban to the Oribi Solar Power Plant, via N3, comprises a total distance of 696 km and via the N3 and N11, it comprises a total distance of 756 km. Richards Bay to the Oribi SPP via the R34 comprises a total distance of a 716 km and via the N2 comprises a total distance of a 727 km. The Port of Durban is the preferred port of entry as this route is the shorter of the two routes. The assessment concluded that the major traffic impact occurs during the construction phase of the project. The impact of the construction trip generation, on the predicted traffic volumes on the local and the regional transportation routes are expected to be low.

5.3.2 Description of the socio-economic environment

The socio-economic environment is described with specific reference to social, economic, heritage and cultural aspects.

5.3.2.1 Socio-economic conditions

The social impact assessment (attached as Appendix E7) explains that the Limpopo Province is the fifth largest province in the country in terms of area and population size. The province's capital and largest city is Polokwane (previously Pietersburg), which is situated in the central part of the province.

Economic activity in the province is primarily driven by mineral-rich deposits, including platinum-group metals, iron ore, chromium, high and middle-grade coking coal, diamonds, antimony, phosphate, and copper, as well as mineral reserves, such as gold, emeralds, scheelite, magnetite, vermiculite, silicon, and mica. Additionally, the region's economy is supported by agricultural activities, with climatic conditions in certain regions allowing for double harvesting seasons, resulting in the region being the largest producer of various crops. The diversity of crops includes sunflowers, cotton, maize, and peanuts in the Bela-Bela and Modimolle region, bananas, litchis, pineapples, mangoes, pawpaw’s, and various nuts in the Tzaneen and Makhado region. Coffee and tea plantations in the province provide multiple employment opportunities for the population.

The province forms an important cross-border transportation route from South Africa to other southern countries in Africa. The N1 national route connects Cape Town via Johannesburg to Mussina in the northern part of South Africa before crossing over to Zimbabwe at the Beit Bridge border over the Limpopo River. The road becomes the A4 in Zimbabwe and connects South Africa to Harare, the capital of Zimbabwe. The Limpopo province is divided into five district municipalities, which are further subdivided into 22 local municipalities.

Waterberg District Municipality (DM)

The Waterberg District Municipality (DM) is a Category C municipality situated in the western part of the Limpopo Province. As the largest of the five district municipalities in Limpopo, the Waterberg DM

covers over one-third of the province and serves as a significant border control region, with five border control points located along the South African and Botswana border. The major towns within the district include Bela-Bela, Lephalale, Modimolle, Mookgophong, and Thabazimbi.

The Waterberg Biosphere, a UNESCO-designated Biosphere Reserve, spans across approximately 654,033 hectares of the region and features an extensive rock formation shaped by millions of years of riverine erosion to yield bluff and butte landforms.

The district's economy is driven primarily by mining, tourism, and agricultural activities, with mining identified as the leading economic driver. The region is one of South Africa's foremost ecotourism destinations, boasting a diverse array of wildlife, birds, and scenic areas distributed throughout the region. The primary minerals extracted from the region include platinum, iron ore, coal, and diamonds, with 40% of the country's coal reserves obtained from the region. The Medupi power station, the fourth-largest power station globally, is located within the region and forms an essential power generation hub for South Africa.

Agriculture in the region is mostly dominated by game farming, with livestock and produce, including cotton, sunflowers, tobacco, and soya bean production, also prevalent. The district's tourism industry is mostly supported by the diverse Bushveld region and privately-owned game reserves that offer leisure and hunting opportunities.

The Waterberg DM is subdivided into five local municipalities, namely Bela-Bela LM, Lephalale LM, Modimolle-Mookgophong LM, Mogalakwena LM, and Thabazimbi LM.

Bela-Bela Local Municipality

The Bela-Bela Local Municipality (LM) is a Category B municipality situated in the south-western part of the Limpopo Province, within the Waterberg DM. Its southern border is shared with the North West, Gauteng, and Mpumalanga Provinces, while the western boundary is shared with the Thabazimbi LM and the northern boundary with the Modimolle-Mookgophong LM, which are the other four LM subdivisions in the Waterberg DM. Major towns in the municipal region include Bela-Bela (Warmbad) and Pienaarsrivier, with smaller settlements including Settlers, Rapotokwana, and Vingerkraal.

The name of the town and municipality is derived from a hot spring in the area, which was called Bela-Bela by the Tawana's who lived in the region in the 19th century, meaning "he who boils on his own". Tourism is the main economic driver in the area, contributing significantly to the district's GDP, particularly in the town of Bela-Bela, which has multiple holiday resorts.

The N1 national route links the Bela-Bela LM directly with the major cities of Gauteng, connecting the area with Pretoria and Johannesburg approximately 100km and 170km to the south, respectively. Additionally, the road connects with Polokwane, the largest and capital city of the Limpopo Province, 200km to the north of the area.

Both the Bela-Bela LM and the Waterberg DM have witnessed an increase in their youth population (aged 0-14 years) from 29.4% in 2011 to 32.9% in 2016. Similarly, the Bela-Bela LM has a higher proportion of elderly individuals (over 65) at 7.9% in 2016, compared to 5.1% in the Waterberg DM.

The dependency ratios of both regions have also increased from 2011 to 2016, with the Bela-Bela LM and Waterberg DM experiencing an increase in the younger population and the Bela-Bela LM having an increase in the elderly population. The dependency ratio of the Bela-Bela LM stands at 40.8%,

implying that almost half of the population (41 individuals out of every 100) are considered dependant.

According to the Census 2011 data, the employment ratio in Bela-Bela LM was 47.2%, which is just below half the population. In the Bela-Bela LM, 36.7% of the population were not economically active, and 13.7% unemployed. The Bela-Bela LM, Waterberg DM and Limpopo Province would benefit from additional job opportunities to reduce its dependency on social grants and pension.

5.3.3 Cultural and heritage environment

The area proposed for development is located in between Bela-Bela, previously known as Warmbaths, in the Limpopo Province and Hammanskraal located north of Pretoria, to the east of the N1. When the Tswana tribes first moved into the region in about the 1800s, they discovered hot springs in the area. The Voortrekker Carl Van Heerden established the first farm in what is now Bela-Bela and called it Het Bad. In 1873, President Burgers' Transvaal government bought the land and established a resort called Hartingsburg after the prominent Dutch biologist Pieter Harting. The British occupied the town during the Anglo-Boer War, and renamed the post office Warm Baths in 1903, and proclaimed the boundaries of Warmbaths to be the entire farm of Het Bad. In 1920 Warmbaths was proclaimed a township.

Cultural landscape

According to the Heritage Impact Assessment (refer to Appendix E5) the broader region has yielded some significant Iron Age Sites such as the Mzonjani facies Broederstroom site (AD 430 to AD 780). According to Murimbika (2010), the broader region was subject to a number of instances of migration and settlement from 450 AD. Evidence indicates that Sotho-Tswana groups migrated in and out of the Magaliesberg region, and such groups are responsible for the many early stone-walled settlements in this region. One of the most documented migrations is the Mfecane (forced migration or scattering) which was a period of widespread chaos and warfare among indigenous ethnic communities in southern Africa during the period between 1815 and about 1840. During this time, the Ndebele under Mzilikazi reached the Magaliesberg region and are responsible for introducing the Doornspruit-type walled settlements that are known from this region (the Doornspruit River drains into the project area). According to Murimbika (2010) this type of stone-walled settlement represents “typical Nguni-Sotho-Tswana acculturation”. Murimbika (2010) further explains that one of the most acculturated groups in the region is known as the “Po”, who’s Chief Mogale lends his name to the Magaliesberg Mountains and the Mogale City Municipality. By the mid-1800’s, Voortrekkers had begun to settle in the foothills of the Magaliesberg mountains and in so doing, clashed with Mzilikazi’s Ndebele in 1837.

These early colonial battles forced the Ndebele north of the Limpopo River and effectively ended the independence of African Chiefdoms in the area. The Voortrekkers went on to establish the Republic of the Transvaal.

As part of the assessment completed by Van der Walt (2007), Birkholtz completed an historical and archival study of the Bela-Bela area. This detailed archival history is not repeated here, however some important notes from Birkholtz are reiterated below as they pertain to the cultural significance of the development area:

- The route between Great Zimbabwe, the copper mines at Messina and the tin mines at Rooiberg passed through the area.

- The railway line and wagon road between Pretoria and then Pietersburg passed through this area. This meant that the region had immense strategic significance during the South African War (1899-1902). Pistorius (2013) notes that historical beacons in the area include a blockhouse which served in the line of blockhouses which stretched from Naauwpoort in the Magaliesberg to Pietersburg during the Anglo Transvaal War (1899-1902).
- A Voortrekker cemetery lies along the Thabazimbi road (Berg 1992, Erasmus 1995).

These points speak to the cultural value of the N1 heading north from Pretoria as a significant historic linking route. Cognisance of this significance must be taken.

Archaeology

Roodt (2008) remarks that "The Bela Bela region has a rich archaeological tradition, starting from the Stone Age period, right up to the Historical period. The following Iron Age material may occur in the region: According to the most recent archaeological cultural distribution sequences by Huffman (2007), this area falls within the distribution area of various cultural groupings originating out of both the Urewe Tradition (eastern stream of migration) and the Kalundu Tradition (western stream of migration)." Previous Heritage Impact Assessments conducted in the immediate vicinity of the proposed study area (Roodt, 2008, Van der Walt, 2007 and 2021 and Huffman, 2008) have identified a number of significant archaeological sites in the vicinity of the study area, dated to the Late Iron Age. Huffman (2008) in his assessment of a site located to the south of Bela-Bela, identified a few Middle Stone Age artefacts however he concluded that due to their context, these artefacts were likely bought into the area from somewhere else along with road ballast and therefore, these artefacts are not conservation-worthy.

Roodt (2008) noted that, 40km north of the area proposed for development, "Buyskop contains a stonewalled archaeological site... The observed ceramic shards are both decorated and undecorated. Thus, it is possible to broadly assign the site to the Blackburn Branch of the Uruwe Tradition, probably Uitkomst facies (AD 1650 – 1820), but could also represent the related Rooiberg facies (AD 1650 – 1750). Cupules (also known as 'dolly holes'), used during rainmaking rituals, were noted in two places adjacent to the existing road, which has already damaged the site. Large ash areas were noted that could be attributed to middens and kraals." The sites identified by Roodt 92008) are graded IIIB due to their moderate scientific value. Roodt (2008) concludes that "Buyskop (Buiskop) appears to have been occupied for an extensive period during the South African Iron Age. Based on ceramic analysis of decorated ceramic shards, occupation can be assigned to the period AD 1650 -1820. The ceramics are associated with the ceramic facies Uitkomst and Rooiberg, thus reflecting occupation by Sotho speaking peoples (Huffman 2007: 433). Rainmaking also occurred on the hill, archaeologically reflected by the presence of cupules."

In his assessment completed for the property located immediately east of the development area, Van Vollenhoven and Strydom (2003) noted that although no Stone Age sites are known from the vicinity of the development, they identified two stone artefacts on the property that they assessed. These they ascribed to the Middle and Later Stone Age. These artefacts were determined to have no context and as such, were determined to be Not Conservation-Worthy. Van Vollenhoven and Strydom (2003) also note that a significant number of Late Iron Age sites are known south of the development area, the best known located at Wallmansthal and associated with the Ndebele occupation of the area. Several sites preserving Moloko pottery are also known from the broader area. However, Van Vollenhoven and Strydom (2003) did not identify any Iron Age sites in their assessment of the adjacent property. Pistorius (2013) concurs with the findings of Van Vollenhoven and Strydom (2003) and notes

that the most common heritage resources which do occur in the broader area are stone walled sites which date from the Late Iron Age. These LIA sites are mostly found along the base lines of kopjes and randjes in the region.

According to Roodt (1999), archaeologists from the University of the Witwatersrand conducted excavations in the mid-1990's at a site located on the Farm Irrigasie 69 JR located immediately south of the Farm Ruimte 74 JR on which this development is proposed. The location of the excavations is indicated in Figure 3 above. According to Roodt (1999), the excavations revealed a burial as well as some pottery and ostrich eggshell beads. In her assessment of a small area located on Farm Pienaarsrivierbrug 70 JR located adjacent to this development area, Roodt (1999) identified five sites of Middle and Later Stone Age artefacts. It is very likely that similar Middle and Later Stone Age artefacts will be present within the development area, as well as sites associated with the Late Iron Age occupation of the area.

Site review

Observations of archaeological and historical material were clustered around the northeastern end of the farm where the chalk mining has occurred, and deeper ground has been disturbed and opened up. Various quartzite flakes, radial cores and retouched pieces were found in and amongst the calcrete jeep tracks and spill and these are likely to have been deposited at lower layers than the rest of the study site. Broken pieces of undecorated Iron Age pottery were also found in the jeep track nearer to the Elandskraal end of the development. The Elandskraal werf itself is a double storey ruined building built in the 1940s - a number of linking jeep tracks emanate from the homestead to kraals and stock posts with further ruins of workers' cottages and farm buildings. The vegetation is very dense and it was not possible to locate much more between the two ends of the development area as the visibility of surface material was near zero outside of the jeep tracks. However, given the relatively small size of this PV area and the low depth of excavations it is unlikely that the MSA layers will be encountered outside of the chalk mine area.

The field assessment did not document any significant archaeological remains within the area proposed for development. No significant heritage resources were identified within the area proposed for development.

Palaeontology

The Palaeontological Impact Assessment (refer to Appendix E6) states that according to the SAHRIS Palaeosensitivity Map (Figure 5.19), the area proposed for development of the PV facilities is underlain by sediments that have Zero and Very High palaeontological sensitivity. The development area is underlain by the Irrigasie Formation of the Karoo Supergroup. This formation is known to preserve Extensive bioturbation by trace fossils as well as Dinosaur remains that include possible "Euskelesaurus" including so-called Gigantoscelus. An important plant fossil locality at Hammanskraal on the Limpopo / Gauteng border at which three insects from the Upper Permian were identified (Riek, 1976).

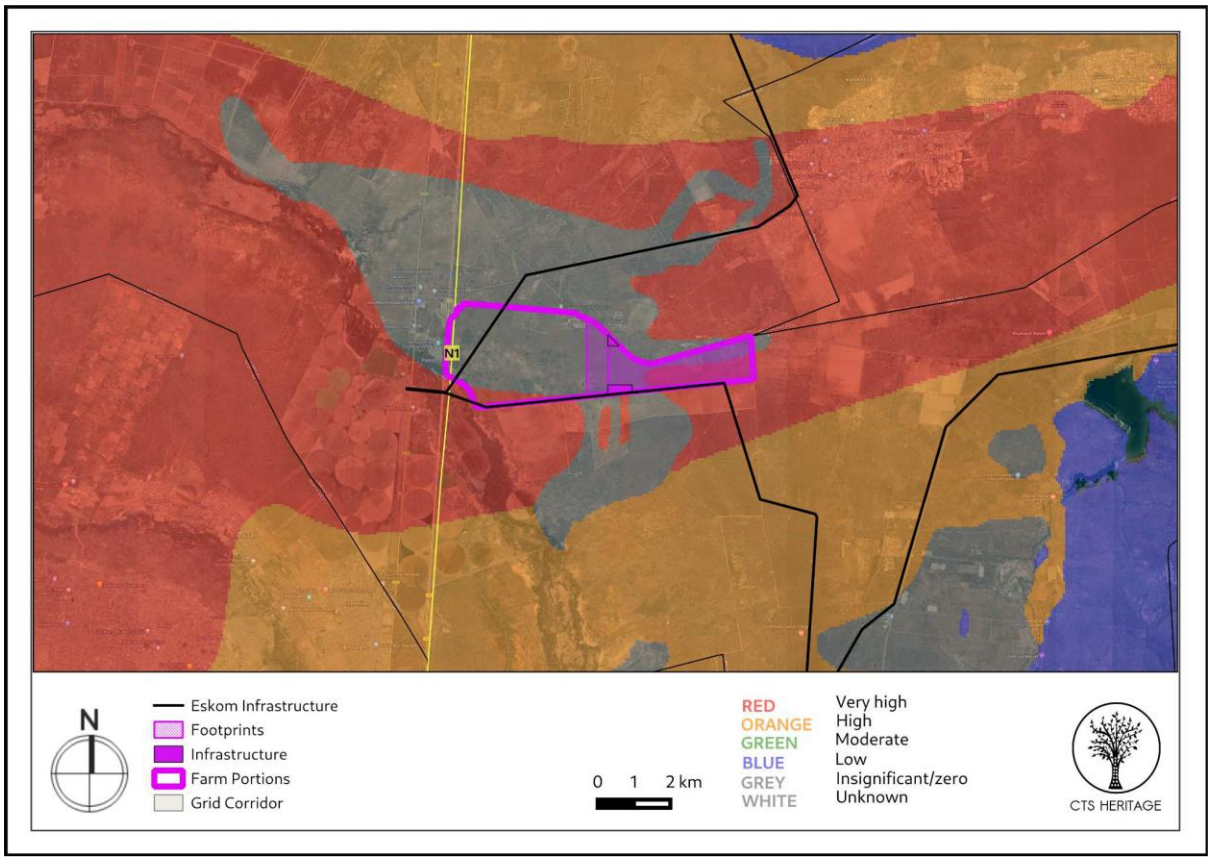


Figure 5.18: Palaeontological sensitivity of the proposed development area

The proposed Oribi SPP is located in the Springbokflats Basin and is largely underlain by the Letaba Formation (Lebombo Group, Karoo Igneous Province) with a small portion of Irrigasie Formation (Undifferentiated Karoo) in the south west of the development footprint. According to the PalaeoMap of the SAHRIS the Palaeontological Sensitivity of Karoo Igneous Province is Zero while that of the Irrigasie Formation is Very High (Almond and Pether, 2009; Almond et al., 2013, Groenewald et al 2014). Updated Geology (Council of Geosciences) indicates that the proposed development is mainly underlain by the Lahau Formation (Lebombo Group, Karoo-Ferrar igneous intrusions) and the Late Triassic Molteno Formation (Stormberg Group, Karoo Supergroup). The potential fossiliferous sedimentary bedrocks have often been thermally metamorphized by overlying dolerite sills compromising their palaeontological sensitivity.

A medium Palaeontological Significance has been allocated for the construction phase of the SPP development pre-mitigation and a very low significance post mitigation.

5.4 SITE SELECTION MATRIX

Due to the nature of the proposed development, the location of the solar power plant is largely dependent on technical and environmental factors such as solar irradiation, climatic conditions, topography of the site, access to the grid and capacity of the grid. Studies of solar irradiation worldwide indicate that the Limpopo Province has a high potential for the generation of power from solar.

The receptiveness of the site to PV Development includes the presence of optimal conditions for the sitting of a solar energy facility due to high irradiation values and optimum grid connection opportunities (i.e., the grid connection points are located within the affected property which minimises the length of power line development and consolidates the overall impacts and disturbance of the project within the affected property). The farm Ruimte No. 720 where the project is proposed to be located is considered favorable and suitable from a technical perspective due to the following characteristics:

- Climatic conditions: Climatic conditions determine if the project will be viable from an economic perspective as the SPP is directly dependent on the annual direct solar irradiation values of a particular area. The Limpopo province receives high averages of direct normal and global horizontal irradiation daily. This is an indication that the regional location of the project includes a low number of rainy days and a high number of daylight hours experienced in the region. The Global Horizontal Radiation value is around 2118 kWh/m^2 per annum is relevant in the area.

- Topographic conditions: The surface area on which the proposed facility will be located has a favourable level topography, which facilitates work involved with construction and maintenance of the facility and ensures that shadowing on the panels do not occur. The topographic conditions, which are favorable, minimises the significance of the impact that will occur during the clearing and leveling of the site for the construction activities.

- Extent of the site: A significant portion of land is required to evacuate up to 150MW and space is a constraining factor in PV facility installations. Provision was made to assess a larger area than is required for the facility to make provision for any other environmental or technical constraints that may arise and avoiding those areas. Larger farms are sought after to make provision for any constraints imposed by the Department of Agriculture on the extent of land that may be used for such facilities per farm, as well as the opportunities presented for the avoidance of sensitive environmental features present. The farm Ruimte No. 720, and the development footprint assessed therein is considered to provide an opportunity for the successful construction and operation of a SPP with a capacity of up to 150MW, as well as opportunities for the avoidance and mitigation of impacts on the affected environment and sensitive environmental features.

- Site availability and access: The land is available for lease by the developer. Reluctant farm owners or farmers over capitalising hamper efforts to find suitable farms. Access to the site is readily available via the D262 district road to the north of the site.

- Grid connection: In order for the PV facility to connect to the national grid the facility will have to construct an on-site substation, Eskom switching station and a power line from the project site to connect to the Eskom grid. Available grid connections are becoming scarce and play a huge role when selecting a viable site. Power will be evacuated into the national grid via the proposed loop-in loop-out connection to the existing Pelly/SAR Pienaarsrivier 132 kV Overhead Line.

- Environmental sensitivities: From an environmental perspective the proposed site is considered highly desirable due to limited environmental sensitivities in terms of geology, and

soils, agricultural potential, vegetation and landscape features, climate, biodiversity and the visual landscape (refer to Section 5.3.1 of this report). The area proposed for development exclusively consists of land used for agriculture, but wetland features (depressions) are located on the development footprint, as well as a drainage line. These environmental sensitive features will need to be considered by the developer for the placement of the facility infrastructure within the development footprint.

It is evident from the discussion above that the farm Ruimte No. 720 may be considered favourable and suitable in terms of the site and environmental characteristics. As mentioned previously, no alternative areas on the property have been considered for the placement of the development footprint as the assessed development footprint avoids any sensitive features. The development footprint of this project will cover a significant portion of the farm, however, provision will be made to exclude any sensitive areas from the facility layout to be developed within the development footprint.

5.5 CONCLUDING STATEMENT ON ALTERNATIVES

When considering the information provided by the specialists with regards to the site selection criteria, the site is identified as preferred due to fact that the opportunities presented on the site to develop the project in such a way which avoids the areas and features (including the associated buffers) of high environmental sensitivity. Therefore, development of the up to 150 MW Oribi SPP on the farm Ruimte No. 720 is the preferred option.

Considering the environmental sensitive features present within the development footprint, the Applicant has proposed a Final facility layout which considers these features, and thereby aim to avoid any direct impact on these features. The Final layout will be further assessed as part of the EIA Phase of the project. Refer to Figure H for the Final layout proposed for development.

6 DESCRIPTION OF THE IMPACTS AND RISKS

This section aims to address the following requirements of the regulations:

Appendix 2. (2) A scoping report (...) must include-

(v) the impacts and risks identified for each alternative, including the nature, significance,

consequence, extent, duration and probability of the impacts, including the degree to which these impacts-

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources; and

(cc) can be avoided, managed or mitigated;

(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;

(vii) positive and negative impacts that the proposed activity and alternatives will have on

the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

(viii) the possible mitigation measures that could be applied and level of residual risk;

6.1 SCOPING METHODOLOGY

The contents and methodology of the scoping report aims to provide, as far as possible, a user-friendly analysis of information to allow for easy interpretation.

- Checklist (see section 6.1.1): The checklist consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts.
- Matrix (see section 6.1.2): The matrix analysis provides a holistic indication of the relationship and interaction between the various activities, development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed activity. The matrix is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts. The matrix also indicates the specialist studies that have been conducted to address the potentially most significant impacts.

6.1.1 Checklist analysis

The independent consultant conducted a site visit on 6 February 2023. The site visit was conducted to ensure a proper analysis of the site-specific characteristics of the study area. Table 6.1 provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the

environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts. The table highlights certain issues, which are further analysed in matrix format in section 6.2.

Table 6.1: Environmental checklist

QUESTION	YES	NO	Un-sure	Description
1. Are any of the following located on the site earmarked for the development?				
I. A river, stream, dam or wetland	✕			Two different HGM units were identified within the project area and were classified as two different depressions. Along with the two depressions a single drainage line was also delineated within the project area. These wetland areas with the specified buffer areas must be excluded for the development layout.
II. A conservation or open space area		✕		The site being considered for development consists of small portions of ESA 2.
III. An area that is of cultural importance		X		None.
IV. Site of geological significance		✕		None.
V. Areas of outstanding natural beauty		✕		None.
VI. Highly productive agricultural land	✕			A single crop field boundary was identified by means of the DEA Screening Tool (2022). However, the information gathered from the site sensitivity verification indicated a "Moderately Low" land capability sensitivity which results into a "Low" land potential.
VII. Floodplain		✕		None.
VIII. Indigenous Forest		✕		None.
IX. Grass land	✕			According to the Ecological Impact Assessment, the project area overlaps with the Springbokvlakte Thornveld vegetation type is classified as Endangered (EN).

X. Bird nesting sites		×		The Avifauna Scoping Assessment (refer to Appendix E2) did not observe any nests of Species of Conservation Concern. The low number of species recorded nesting within the site should be interpreted with caution because the survey was undertaken using point surveys, and the full assessment area was not yet covered. It is postulated that more species are likely to be nesting if an assessment of the full site is done.
XI. Red data species		×		The Avifauna Scoping Assessment (refer to Appendix E2) did not record any Red Data Species on site but indicated that 28 species may occur on site that are considered SCC.
XII. Tourist resort		×		None.
2. Will the project potentially result in potential?				
I. Removal of people		×		None.
II. Visual Impacts	×			The VIA (refer to Appendix E8) confirmed that the significance of the visual impact will be a "Negative Low Impact". The only receptors likely to be impacted by the proposed development are residents living and working on nearby farms, people travelling on the D205 district road, residents of Kalkheuwel and residents of Masobe.
III. Noise pollution		×		Construction activities will result in the generation of noise over a period of 12-18 months. The noise impact is unlikely to be significant.
IV. Construction of an access road		×		Access will be obtained via a gravel road off the D262 district road.
V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air.		×		None.

VI. Accumulation of large workforce (>50 manual workers) into the site.	×			Approximately 500 employment opportunities will be created during the construction phase and 50 employment opportunities during the operation phase of the SPP project.
VII. Utilisation of significant volumes of local raw materials such as water, wood etc.	×			The estimated maximum amount of water required during the facility's 20 years of production is approximately 4200m³ per annum.
VIII. Job creation	×			Approximately 500 employment opportunities will be created during the construction and 50 employment opportunities during the operational phases for the SPP project.
IX. Traffic generation	×			Traffic will be generated over the 12–18-month construction period for the SPP.
X. Soil erosion	×			The site will need to be cleared or graded to a limited extent, which may potentially result in a degree of dust being created, increased runoff and potentially soil erosion. The time that these areas are left bare will be limited to the construction phase, since vegetation will be allowed to grow back after construction.
XI. Installation of additional bulk telecommunication transmission lines or facilities		×		None.
3. Is the proposed project located near the following?				
I. A river, stream, dam or wetland		×		Closest river or wetland is 2.5 km away from the project area.
II. A conservation or open space area	×			The project area overlaps with Priority focus areas and is located within 5 km of a number of protected areas.
III. An area that is of cultural importance		×		None.
IV. A site of geological significance		×		None.
V. An area of outstanding natural beauty		×		None.
VI. Highly productive agricultural land		×		None.

VII. A tourist resort		✕		None.
VIII. A formal or informal settlement	✕			The closest town to the project is Pienaarsriver, located approximately 1km east of the proposed development.

6.1.2 Matrix analysis

The matrix describes the relevant listed activities, the aspects of the development that will apply to the specific listed activity, a description of the environmental issues and potential impacts, the significance and magnitude of the potential impacts and possible mitigation measures. The matrix also highlights areas of particular concern (see Table 6.2) for more in-depth assessment during the EIA process. An indication is provided of the specialist studies being conducted and which informed the initial assessment. Each cell is evaluated individually in terms of the nature of the impact, duration and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered insignificant if proper mitigation measures were implemented.

In order to conceptualise the different impacts, the matrix specify the following:

- **Stressor**: Indicates the aspect of the proposed activity, which initiates and cause impacts on elements of the environment.
- **Receptor**: Highlights the recipient and most important components of the environment affected by the stressor.
- **Impacts**: Indicates the net result of the cause-effect between the stressor and receptor.
- **Mitigation**: Impacts need to be mitigated to minimise the effect on the environment.

Please refer to **Appendix E** (specialist studies) a more in-depth assessment of the potential environmental impacts.

Table 6.2: Matrix analysis

For ease of reference the significance of the impacts is colour-coded as follow: Avifaunal Scoping Assessment

Soil and Agricultural Potential Assessment

Low significance	Medium significance	High significance	Positive impact

LISTED ACTIVITY (The Stressor)	ASPECTS OF THE DEVELOPMENT /ACTIVITY		POTENTIAL IMPACTS		SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS							MITIGATION OF POTENTIAL IMPACTS			SPECIALIST STUDIES / INFORMATION
			Receptors	Impact description / consequence	Minor	Major	Extent	Duration	Probability	Reversibility	Irreplaceable loss of resources	Possible Mitigation	Possible mitigation measures	Level of residual risk	
CONSTRUCTION PHASE															
• *Activity 11 (i) (GN.R. 327): "The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."* • *Activity 24 (ii) (GN.R 327): "The development of a road (ii) with reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters."* • *Activity 56 (ii) (GN.R 327): "The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (ii) where no reserve*	Site clearing and preparation Certain areas of the site will need to be cleared of vegetation and some areas may need to be levelled. Civil works The main civil works are: • Terrain levelling if necessary– Levelling will be minimal as the potential site chosen is relatively flat. • Laying foundation- The structures will be connected to the ground through cement pillars, cement slabs or metal screws. The exact method will depend on the detailed geotechnical analysis. • Construction of access and inside roads/paths – existing paths will be used	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Direct habitat destruction. • Habitat fragmentation. • Increased soil erosion and sedimentation. • Soil and water pollution. • Air pollution. • Spread and establishment of alien invader species. • Negative effect of human activities on fauna and road mortalities.		-	S	L	D	PR	ML	Yes	- See Table 6.3	L	Terrestrial Ecology Baseline and Impact Assessment (Appendix E1)
			Avifauna	• Displacement of priority avian species from important habitats. • Displacement of resident avifauna through increased disturbance. • Loss of important avian habitats.		-	S	M	Pr	PR	ML	Yes	- See Table 6.3	L	Avifauna Scoping Assessment (Appendix E2)
			Air	• Air pollution due to the increase of traffic of construction vehicles and the undertaking of construction activities.	-		S	S	D	CR	NL	Yes	- Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring	L	-

exists, where the existing road is wider than 8 metres…" • *Activity 1 (GN.R. 325): "The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more..."* • *Activity 15 (GN.R. 325): "The clearance of an area of 20 hectares or more of indigenous vegetation..."* • *Activity 4 (e)(i)(bb)(ee) & (hh) (GN.R. 324): "The development of a road wider than 4 metres with a reserve less than 13,5 metres within (e) the Limpopo province, (i) outside urban areas, (bb) National Protected Area Expansion Strategy Focus areas; (ee) within critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (hh) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas."*	were reasonably possible. Additionally, the turning circle for trucks will also be taken into consideration. Transportation and installation of PV panels into an Array The panels are assembled at the supplier's premises and will be transported from the factory to the site on trucks. The panels will be mounted on metal structures which are fixed into the ground either through a concrete foundation or a deep-seated screw. Wiring to the Central Inverters Sections of the PV array would be wired to central inverters which have a maximum rated power of 2000kW each. The inverter is a pulse width mode inverter that converts DC electricity to alternating electricity (AC) at grid frequency.											that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.		
			Soil	• Loss of agricultural potential by occupation of land. • Loss of agricultural potential by soil degradation. • Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Physical and chemical degradation of the soils by construction vehicles (hydrocarbon spills). • Loss of topsoil.	-		S	S	Pr	PR	ML	Yes	- See Table 6.3	L	Soil and agricultural Potential Study (Appendix E4)
			Geology	• Collapsible soil. • Seepage. • Active soil (high soil heave). • Erodible soil. • Hard/compact geology. If the bedrock occurs close to surface it may present problems when driving solar panel columns. • The presence of undermined ground. • Instability due to soluble rock. • Steep slopes or areas of unstable natural slopes. • Areas subject to seismic activity.	-	-	S	S	Pr	CR	NL	Yes	- The most effective mitigation will be the minimisation of the project footprint by using the existing roads in the area and not create new roads to prevent other areas also getting compacted. - Retention of vegetation where possible to avoid soil erosion.	L	-
			Existing services infrastructure	• Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the local sewage plant.	-		L	S	D	PR	ML	Yes	-	L	Confirmation from the Local Municipality

• *Activity 10 (e)(i) (GN.R 324): "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 (e) in the Limpopo province (i) all areas.* • *Activity 12 (e)(ii) (GN.R 324): "The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation in (e) Limpopo (ii) within critical biodiversity areas identified in bioregional plans".* • *Activity 14(ii)(a)(c)(e)(i)(ff)&(hh) (GN.R 324): "The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs (a) within a watercourse or (c) within 32 metres of a watercourse, measured from the edge of a watercourse, (e) within the Limpopo province, (i) outside urban areas*				• Increase in construction vehicles on existing roads.										
			Groundwater	• Pollution due to construction vehicles and the storage and handling of dangerous goods.	-		S	S	Pr	CR	ML	Yes	- A groundwater monitoring programme (quality and groundwater levels) should be designed and installed for the site. - Monitoring boreholes should be securely capped, and must be fitted with a suitable sanitary seal to prevent surface water flowing down the outside of the casing. - Full construction details of monitoring boreholes must be recorded when they are drilled. - Sampling of monitoring boreholes should be done according to recognised standards.	L	-
			Surface water	• Impact on the characteristics of the watercourse • Soil compaction and increased risk of sediment transport and erosion • Soil and water pollution • Spread and establishment of alien invasive species		-	L	S	Pr	PR	ML	Yes	- See Table 6.3	L	Wetland Baseline and Risk Assessment (Appendix E1)
			General Environment (risks associated with BESS)	• Mechanical breakdown / Exposure to high temperatures • Fires, electrocutions and spillage of toxic substances into the surrounding environment.		-	S	M	Pr	PR	ML	Yes	- Operators are trained and competent to operate the BESS. Training should include the discussion of the following:	L	-

within (ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans and (hh) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA". • *<u>Activity 18 (e)(i) (bb)(ee)(gg) & (hh) (GN.R 324):</u> "The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre (e) Limpopo (i) outside urban areas, (bb) National Protected Area Expansion Strategy Focus areas; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (hh) areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland."*				• Spillage of hazardous substances into the surrounding environment. • Soil contamination – leachate from spillages which could lead to an impact of the productivity of soil forms in affected areas. • Water Pollution – spillages into surrounding watercourses as well as groundwater. • Health impacts – on the surrounding communities, particularly those relying on watercourses (i.e. rivers, streams, etc) as a primary source of water. • Generation of hazardous waste									- Potential impact of electrolyte spills on groundwater; - Suitable disposal of waste and effluent; - Key measures in the EMPr relevant to worker's activities; - How incidents and suggestions for improvement can be reported. - Training records should be kept on file and be made available during audits. - Battery supplier user manuals safety specifications and Material Safety Data Sheets (MSDS) are filed on site at all times. - Compile method statements for approval by the Technical/SHEQ Manager for the operation and management and replacement of the battery units / electrolyte for the duration of the project life cycle. Method statements should be kept on site at all times. - Provide signage on site specifying the		

														types of batteries in use and the risk of exposure to hazardous material and electric shock. Signage should also specify how electrical and chemical fires should be dealt with by first responders, and the potential risks to first responders (e.g. the inhalation of toxic fumes, etc.). - Firefighting equipment should readily be available at the BESS area and within the site. - Maintain strict access control to the BESS area. - Ensure all maintenance contractors / staff are familiar with the supplier's specifications. - Undertake daily risk assessment prior to the commencement of daily tasks at the BESS. This should consider any aspects which could result in fire or spillage, and appropriate actions should be taken to prevent these. - Standard Operating Procedures (SOPs) should be made available by the		

														Supplier to ensure that the batteries are handled in accordance with required best practices. - Spill kits must be made available to address any incidents associated with the flow of chemicals from the batteries into the surrounding environment. - The assembly of the batteries on-site should be avoided as far as possible. Activities on-site for the BESS should only be limited to the placement of the container wherein the batteries are placed. - Undertake periodic inspections on the BESS to ensure issues are identified timeously and addressed with the supplier where relevant. - The applicant in consultation with the supplier must compile and implement a Leak and Detection Monitoring Programme during the project life cycle of the BESS. - Batteries must be strictly maintained by		

														the supplier or suitably qualified persons for the duration of the project life cycle. No unauthorised personnel should be allowed to maintain the BESS. - Damaged and used batteries must be removed from site by the supplier or any other suitably qualified professional for recycling or appropriate disposal. - The applicant should obtain a cradle to grave battery management plan from the supplier during the planning and design phase of the system. The plan must be kept on site and adhered to.		
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Job creation. • Business opportunities. • Skills development.		+	P	S	D	I	N/A	Yes	- See Table 6.3	L	Social Impact Assessment (Appendix E7)
			Visual landscape	• Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility. • Lighting impacts. • Solar glint and glare impacts. • Visual sense of place impacts.		-	L	S	D	CR	NL	Yes	- See Table 6.3	M	Visual Impact Assessment (Appendix E3)
			Traffic volumes	• Increase in construction vehicles.	-		L	S	Pr	CR	NL	Yes	- Delivery and construction trips will be insignificant when	L	Traffic Impact Assessment

													compared to the Average Daily Traffic (ADT) and will not affect the existing Level of Service (LOS). It can therefore be concluded that, on both routes, no mitigation measures will be necessary.		(Appendix E8)
			Health & Safety	• Air/dust pollution. • Road safety. • Impacts associated with the presence of construction workers on site and in the area. • Influx of job seekers to the area. • Increased safety risk to farmers, risk of stock theft and damage to farm infrastructure associated with presence of construction workers on the site. • Increased risk of veld fires.		-	L	L	Pr	PR	ML	Yes	- See Table 6.3	M	Social Impact Assessment (Appendix E7)
			Noise levels	• The generation of noise as a result of construction vehicles, the use of machinery such as drills and people working on the site.	-		L	S	D	CR	NL	Yes	- During construction care should be taken to ensure that noise from construction vehicles and plant equipment does not intrude on the surrounding residential areas. Plant equipment such as generators, compressors, concrete mixers as well as vehicles should be kept in good operating order and where appropriate have effective exhaust mufflers.	L	Social Impact Assessment (Appendix E7)

			Tourism industry	• Since there are no sensitive tourism facilities in close proximity to the site, the proposed activities will not have an impact on tourism in the area.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Heritage resources	• Loss or damage to sites, features or objects of cultural heritage significance	-		S	S	U	PR	ML	Yes	- See Table 6.3	L	Heritage Impact Assessment (Appendix E5)
			Paleontological Heritage	• Disturbance, damage or destruction of legally-protected fossil heritage* within the development footprint during the construction phase		-	S	P	U	IR	ML	Yes	N/A	L	Paleontological Impact Assessment (Appendix E6)
OPERATIONAL PHASE															
<u>Activity 11(i) (GN.R. 327):</u> *"The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."* <u>Activity 1 (GN.R 325):</u> *"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more."* <u>Activity 28 (ii) (GN.R. 327):</u> *"Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such*	The key components of the proposed project are described below: • <u>PV Panel Array</u> - To produce 150 MW, the proposed facility will require numerous linked cells placed behind a protective glass sheet to form a panel. Multiple panels will be required to form the solar PV arrays which will comprise the PV facility. The PV panels will be tilted at a northern angle in order to capture the most sun. • <u>Wiring to Central Inverters</u> - Sections of the PV array will be wired to central inverters. The inverter is a pulse width mode inverter	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Direct habitat destruction • Habitat fragmentation • Increased soil erosion and sedimentation. • Soil and water pollution • Air pollution • Spread and establishment of alien invader species. • Negative effect of human activities on fauna and road mortalities.		-	L	L	Po	PR	ML	Yes	- See Table 6.4	L	Terrestrial Ecology Baseline and Impact Assessment (Appendix E1)
			Avifauna	• Displacement of priority avian species from important habitats. • Displacement of resident avifauna through increased disturbance. • Collisions with PV panels leading to injury or loss of avian life. • Insignificnt impacts expected to be associated with the power line as the line is prpoposed to be of a very short length.		-	S	L	Pr	PR	ML	Yes	- See Table 6.4	M	Avifaunal Impact Assessment (Appendix E2)

development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare."	that converts direct current (DC) electricity to alternating current (AC) electricity at grid frequency. • Connection to the grid - Connecting the array to the electrical grid requires transformation of the voltage from 480V to 33kV to 132kV. The normal components and dimensions of a distribution rated electrical substation will be required. Output voltage from the inverter is 480V and this is fed into step up transformers to 132kV. An onsite substation will be required on the site to step the voltage up to 132kV, after which the power will be evacuated into the national grid. • Supporting Infrastructure – Auxiliary buildings with basic services such as water and electricity will be constructed on the site and will have an approximate footprint 820m². Other supporting infrastructure includes voltage and current regulators and protection circuitry. • Roads – Access will be required to provide access		Air quality	• The proposed development will not result in any air pollution during the operational phase.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Soil	• Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Loss of agricultural potential (low significance relative to agricultural potential of the site).	-		L	L	D	PR	SL	Yes	- See Table 6.4	L	Soil and Agricultural Potential Study (Appendix E4)
			Geology	• Collapsible soil. • Active soil (high soil heave). • Erodible soil. • Hard/compact geology. If the bedrock occurs close to surface it may present problems when driving power line columns. • The presence of undermined ground. • Instability due to soluble rock. • Steep slopes or areas of unstable natural slopes. • Areas subject to seismic activity. • Areas subject to flooding.	-		S	S	Po	PR	ML	Yes	- Surface drainage should be provided to prevent water ponding. - Mitigation measures proposed by the detailed engineering geological investigation should be implemented.	L	-
			Groundwater	• Leakage of hazardous materials. The development will comprise of a distribution substation and will include transformer bays which will contain transformer oils. Leakage of these oils can contaminate water supplies.	-		L	L	Po	PR	ML	Yes	- All areas in which substances potentially hazardous to groundwater are stored, loaded, worked with or disposed of should be securely bunded (impermeable floor and sides) to prevent accidental discharge to groundwater.	L	-

	to the solar field and associated infrastructure. All site roads will require a width of approximately 6 m – 12 m. • Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm.		Surface water	• Impact on the characteristics of the watercourse • Soil compaction and increased risk of sediment transport and erosion • Soil and water pollution • Spread and establishment of alien invasive species		-	L	L	Pr	PR	ML	Yes	- See Table 6.4	L	Wetland Baseline and Risk Assessment (Appendix E1)
		SOCIAL/ECONOMIC	Visual landscape	• Visual impact on observers travelling along the roads and residents at homesteads within a 5km radius of the SPP. • Visual impact on observers travelling along the roads and residents at homesteads within a 5-10km radius of the SPP. • Visual impacts of lighting at night on sensitive visual receptors in close proximity to the proposed facility. • Visual impacts of glint and glare on sensitive visual receptors in close proximity to the proposed facility. • Visual impacts on observers travelling along the roads and residents at homesteads in close proximity to the power line structures. • Visual impacts and sense of place impacts associated with the operation phase of SPP.		-	L	L	D	PR	ML	Yes	- See Table 6.4	L	Visual Impact Assessment (Appendix E3)
			Traffic volumes	• The proposed development will not result in any traffic impacts during the operational phase.	-		L	L	Po	CR	NL	Yes	-	L	Traffic Impact Assessment (Appendix E8)

			Health & Safety	• The proposed development will not result in any health and safety impacts during the operational phase.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A	N/A
			Noise levels	• The proposed development will not result in any noise pollution during the operational phase.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Heritage resources	• Loss or damage to sites, features or objects of cultural heritage significance	-		S	S	U	PR	ML	Yes	- See Table 6.4	L	Heritage Impact Assessment (Appendix E5)
			Electricity supply	• Generation of additional electricity. The power line will transport generated electricity into the grid.	+		I	L	D	I	N/A	Yes	-	N/A	-
			Electrical infrastructure	• Additional electrical infrastructure. The proposed solar facility will add to the existing electrical infrastructure and aid to lessen the reliance of electricity generation from coal-fired power stations.	+		I	L	D	I	N/A	Yes	-	N/A	-
DECOMMISSIONING PHASE															
-	<u>Dismantlement of infrastructure</u> During the decommissioning phase the Solar PV Energy facility and its associated infrastructure will be dismantled. <u>Rehabilitation of biophysical environment</u> The biophysical environment will be rehabilitated.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Improvement of habitat through revegetation / succession over time • Soil erosion and sedimentation. • Spreading and establishment of alien invasive species • Habitat degradation due to dust • Spillages of harmful substances • Road mortalities of fauna / impact of human activities on site.		-	S	L	Po	N/A	N/A	Yes	- See Table 6.5	L	Terrestrial Ecology Baseline and Impact Assessment (Appendix E1)

			Air quality	• Air pollution due to the increase of traffic of construction vehicles.	-		S	S	D	CR	NL	Yes	- Regular maintenance of equipment to ensure reduced exhaust emissions.	L	-
			Soil	• Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Physical and chemical degradation of the soils by construction vehicles (hydrocarbon spills).	-		S	S	Pr	PR	M	Yes	- See Table 6.3	L	Soil and Agricultural Potential Study (Appendix E4)
			Geology	• It is not foreseen that the decommissioning phase will impact on the geology of the site or vice versa.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Existing services infrastructure	• Generation of waste that needs to be accommodated at a licensed landfill site. • Generation of sewage that needs to be accommodated by the municipal sewerage system and the local sewage plant. • Increase in construction vehicles.	-		L	S	D	I	NL	Yes	-	L	-
			Groundwater	• Pollution due to construction vehicles.	-		S	S	Pr	CR	ML	Yes	-	L	-
			Surface water	• Increase in stormwater run-off. • Pollution of water sources due to soil erosion.		-	L	S	Pr	PR	ML	Yes	- Removal of any historically contaminated soil as hazardous waste. - Removal of hydrocarbons and other hazardous substances by a suitable contractor to reduce contamination risks. - Removal of all substances which can	M	-

													result in groundwater (or surface water) contamination.		
			Visual landscape	• Potential visual impact on visual receptors in close proximity to proposed facility. • The decommissioning phase of the project will result in the same visual impacts experienced during the construction phase of the project. However, in the case of Oryx SPP it is anticipated that the proposed facility will be refurbished and upgraded to prolong its life.	-		L	S	D	CR	NL	Yes	- See Table 6.3	L	Visual Impact Assessment (Appendix E3)
			Traffic volumes	• Increase in construction vehicles.	-		L	S	Pr	CR	NL	Yes	- Movement of heavy construction vehicles through residential areas should be timed to avoid peak morning and evening traffic periods. In addition, movement of heavy construction vehicles through residential areas should not take place over weekends.	L	Traffic Impact Assessment (Appendix E8)
			Health & Safety	• Air/dust pollution. • Road safety. • Increased crime levels. The presence of construction workers on the site may increase security risks associated with an increase in crime levels as a result of influx of people in the rural area.	-		L	S	Pr	PR	ML	Yes	- See Table 6.3	L	Social Impact Assessment (Appendix E7)

			Noise levels	• The generation of noise as a result of construction vehicles, the use of machinery and people working on the site.	-		L	S	D	CR	NL	Yes	- See Table 6.3	L	Social Impact Assessment (Appendix E7)
			Tourism industry	• Since there are no tourism facilities in close proximity to the site, the decommissioning activities will not have an impact on tourism in the area.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Heritage resources	• It is not foreseen that the decommissioning phase will impact on any heritage resources.	-		S	S	U	PR	ML	Yes	- See Table 6.3	L	Heritage Impact Assessment (Appendix E5)

6.2 KEY ISSUES IDENTIFIED

From the above it is evident that mitigation measures should be available for potential impacts associated with the proposed activity and development phases. The scoping methodology identified the following key issues which should be addressed in more detail in the EIA report.

6.2.1 Impacts during the construction phase

During the construction phase the following activities will have various potential impacts on the biophysical and socio-economic environment:

- *Activity 11 (i) (GN.R. 327): "The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."*
- *Activity 24 (ii) (GN.R 327): "The development of a road (ii) with reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters."*
- *Activity 28 (ii) (GN.R. 327): "Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare."*
- *Activity 56 (ii) (GN.R 327): "The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (ii) where no reserve exists, where the existing road is wider than 8 metres…"*
- *Activity 1 (GN.R. 325): "The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more..."*
- *Activity 15 (GN.R. 325): "The clearance of an area of 20 hectares or more of indigenous vegetation..."*
- *Activity 4 (e)(i)(bb)(ee) & (hh) (GN.R. 324): "The development of a road wider than 4 metres with a reserve less than 13,5 metres within (e) the Limpopo province, (i) outside urban areas, (bb) National Protected Area Expansion Strategy Focus areas; (ee) within critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (hh) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas."*
- *Activity 10 (e)(i) (GN.R 324): "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 (e) in the Limpopo province (i) all areas.*
- *Activity 12 (e)(ii) (GN.R 324): "The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation in (e) Limpopo (ii) within critical biodiversity areas identified in bioregional plans".*

- *Activity 14(ii)(a)(c)(e)(i)(ff)&(hh) (GN.R 324): "The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs (a) within a watercourse or (c) within 32 metres of a watercourse, measured from the edge of a watercourse, (e) within the Limpopo province, (i) outside urban areas within (ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans and (hh) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA".*
- *Activity 18 (e)(i) (bb)(ee)(gg) & (hh) (GN.R 324): "The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre (e) Limpopo (i) outside urban areas, (bb) National Protected Area Expansion Strategy Focus areas; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Areas within … 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (hh) areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland."*

During the construction phase temporary negative impacts are foreseen over the short term. Table 6.3 summarises the potentially most significant impacts and the mitigation measures that are proposed during the construction phase.

Table 6.3: Impacts and the mitigation measures during the construction phase

SPECIALIST STUDY	IMPACT	PRE-MITIGATION RATING	POST MITIGATION RATING	SUMMARY OF MITIGATION MEASURES
Terrestrial Ecology Baseline and Impact Assessment (Appendix E1)	Destruction, loss and fragmentation of habitats, ecosystems and the vegetation community.	Negative High	Negative Medium	• Bruch cutting should be implemented beneath the panels, no vegetation clearing should be permitted. • Areas rated as High sensitivity and their buffers in proximity to the development areas should be avoided as much is feasible. Infrastructure spanning delineated watercourses to prevent hydrological barriers is considered avoidance. Avoided areas must be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent access to these areas from construction workers and machinery. Mitigated development in medium sensitivity areas is permissible. • Areas outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon. • All laydown, chemical toilets etc. should be restricted to low sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials where possible.

				No storage of vehicles or equipment will be allowed outside of the designated project areas. • Any individual of the protected plants that are present needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. High visibility flags must be placed near any protected plants in order to avoid any damage or destruction of the species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program. All protected plants should be relocated where feasible. If the plants cannot be relocated seed must be collected and utilised as part of the rehabilitation process. • Existing access routes, especially roads, must be made use of. • All construction waste must be removed from site at the closure of the construction phase. • <u>Waste management:</u> • Litter, spills, fuels, chemical and human waste in and around the project area must be minimised and controlled according to the waste management plan. • Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan type concrete mixers be utilised. Any spills must be immediately contained and isolated from the natural environment, before being removed from site. • <u>Environmental awareness training:</u> • All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof.

				• Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of sensitive flora and fauna species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. • Contractors and employees must all undergo the induction and must be made aware of the sensitive areas to be avoided.
	Introduction of Invasive Alien Plant (IAP) species and invasive fauna.	Negative Medium	Negative Low	• The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths.
	Displacement of the indigenous faunal community (including SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, dust, light, vibration, and poaching).	Negative Medium	Negative Low	• A qualified Environmental Control Officer must be on site when construction begins. A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the wet season. In situations where the protected plants must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated. • Clearing and disturbance activities must be conducted in a progressive linear manner, from the north to the south of the project area and over several days, so as to provide an easy escape route for all small mammals and herpetofauna.

				• The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this. • The duration of the activities should be minimized to as short a term as possible, to reduce the period of disturbance on fauna. • Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to reptile species and nocturnal mammals. • Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible. • Any holes/deep excavations must be dug and planted in a progressive manner and shouldn't be left open overnight. Should any holes remain open overnight they must be properly covered temporarily to ensure that no small fauna species fall in, and subsequently inspected prior to backfilling. • Wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed every 50m, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area. • Use environmentally friendly cleaning and dust suppressant products. • Once the development layout has been confirmed, the footprint area must be fenced off appropriately in segments

				pre-construction to allow animals to move or be moved out of these areas before breaking ground activities occur. Construction activities must take place systemically and the perimeter fence should not be completed (i.e., leaving sections unfenced to allow fauna to escape) until systematic clearing is completed. Dust: • Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes the wetting of exposed soft soil surfaces. • No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.
Avifauna Impact Assessment (Appendix E2)	Destruction, fragmentation and degradation of habitats and ecosystems			• To be assessed as part of the EIR report following the dry assessment of the site.
	Direct mortality of avifauna			
	Reduced migration of avifauna			
	Environmental pollution due to water runoff, PV cleaning products, spills from vehicles and erosion			
	Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust, heat radiation and light pollution.			
	Staff and others interacting directly with avifauna (potentially dangerous) or poaching of birds/eggs			
Wetland Riparian Delineation and Aquatic Biodiversity Assessment (Appendix E3)	Direct disturbance / degradation / loss to wetland soils or vegetation due to the	Negative Medium	Negative Low	• Clearly demarcate the construction footprint and restrict all construction activities to within the proposed infrastructure area. • When clearing vegetation, allow for some vegetation cover as opposed to bare areas.

	construction of the solar facility.			• Minimize the disturbance footprint and the unnecessary clearing of vegetation outside of this area. • Use the wetland shapefiles to signpost the edge of the wetlands closest to site. Place the sign 25 m from the edge (this is the buffer zone). Label these areas as environmentally sensitive areas, keep out. • Educate staff and relevant contractors on the location and importance of the identified wetlands through toolbox talks and by including them in site inductions as well as the overall master plan. • All activities (including driving) must adhere to the 26m buffer area. • Promptly remove / control all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed. • Landscape and re-vegetate all denuded areas as soon as possible.
	Increased erosion and sedimentation.	Negative Medium	Negative Low	• Limit construction activities near (< 50m) wetlands to winter (as much as possible) when rain is least likely to wash concrete and sand into the wetland. Activities in black turf soils can become messy during the height of the rainy season and construction activities should be minimised during these times to minimise unnecessary soil disturbances. • Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash. • No activities are permitted within the wetland and associated buffer areas. • Landscape and re-vegetate all unnecessarily denuded areas as

				soon as possible.
	Potential contamination of wetlands with machine oils and construction materials.	Negative Low	Negative Low	• Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility. • Appropriately stockpile topsoil cleared from the project area. • Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking and entering the wetlands. • No activities are permitted within the wetland and associated buffer areas.
Visual Impact Assessment (Appendix E8)	Visual impact of construction activities on sensitive visual receptors in close proximity to the SPP.	Negative Medium	Negative Low	Planning • Retain and maintain natural vegetation immediately adjacent to the development footprint. Construction • Ensure that vegetation is not unnecessarily removed during the construction phase. • Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) where possible. • Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. • Ensure that rubble, litter, etc. are appropriately stored (if it can't be removed daily) and then disposed of regularly at a licenced waste site.

				• Reduce and control dust during construction by utilising dust suppression measures. • Limit construction activities to between 07:00 and 18:00, where possible, in order to reduce the impacts of construction lighting. • Rehabilitate all disturbed areas immediately after the completion of construction work and maintain good housekeeping.
Soil and Agricultural Potential Assessment (Appendix E4)	Loss of Land Capability	Negative Low	Negative Low	• Avoidance of all high agricultural production land and other actively cultivated areas, where avoidance is not feasible stakeholder engagement should occur to compensate affected landowners. • Make use of existing roads or upgrades tracks before new roads are constructed. The number and width of internal access routes must be kept to a minimum. • A stormwater management plan must be implemented for the development. The plan must provide input into the road network and management measures. • Substations foundation and pylons placement must be (preferably) located in already disturbed areas that are not actively cultivated. • Rehabilitation of the area must be initiated from the onset of the project. Soil stripped from infrastructure placement can be used for rehabilitation efforts. • Vegetate or cover all stockpiles after stripping/removing soils

				• Storage of potential contaminants should be undertaken in bunded areas • All contractors must have spill kits available and be trained in the correct use thereof. • All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping". • No cleaning or servicing of vehicles, machines and equipment may be undertaken in water resources. • Have action plans on site, and training for contractors and employees in the event of spills, leaks and other impacts to the aquatic systems.
Heritage Impact Assessment (Appendix E5)	Loss or damage to sites, features or objects of cultural heritage significance.	Negative Low	Negative Low	• The contractors and workers should be notified that archaeological sites might be exposed during the construction activities; • Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer (ECO) shall be notified as soon as possible; • All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the ECO will advise the necessary actions to be taken;

				• Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and • Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA, Section 51(1).A person or entity, e.g. the ECO, should be tasked to take responsibility for the heritage sites and held accountable for any damage.
Palaeontological Impact Assessment (Appendix E6)	Destroy or permanently seal-in fossils at or below the surface that are then no longer available for scientific study	Negative Medium	Negative Low	• The ECO for this project must be informed that the Adelaide Subgroup (Beaufort Group, Karoo Supergroup) has a Very High Palaeontological Sensitivity. • If Palaeontological Heritage is uncovered during surface clearing and excavations the Chance find Protocol attached should be implemented immediately. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources Agency (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation (recording and collection) can be carried out. • Before any fossil material can be collected from the development site the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012).

				• These recommendations should be incorporated into the Environmental Management Plan for the Oribi Solar Power Plant.
Social Impact Assessment (Appendix E7)	Direct and indirect employment opportunities and skills development	Positive Low	Positive Medium	• A local employment policy should be adopted to maximise opportunities made available to the local labour force. • Labour should be sourced from the local labour pool, and only if the necessary skills are unavailable should labour be sourced from (in order of preference) the greater Thabo Matjhabeng DM, Limpopo Province, South Africa, or elsewhere. • Where feasible, training and skills development programmes should be initiated prior to the commencement of the construction phase. • As with the labour force, suppliers should also as far as possible be sourced locally. • As far as possible local contractors that are compliant with Broad-Based Black Economic Empowerment (B-BBEE) criteria should be used. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.
	Economic multiplier effects from the use of local goods and services.	Positive Low	Positive Medium	• It is recommended that a local procurement policy is adopted to maximise the benefit to the local economy. • A database of local companies, specifically Historically Disadvantaged Individuals (HDIs) which qualify as potential service providers (e.g., construction companies, security companies, catering companies, waste collection companies, transportation companies etc.) should be created and

				companies listed thereon should be invited to bid for project-related work where applicable. • Local procurement is encouraged along with engagement with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers where feasible.
	Potential loss in productive farmland.	Negative Medium	Negative Low	• The proposed site for the Oribi SPP needs to be fenced off prior to the construction phase and all construction related activities should be confined in this fenced off area. • Livestock grazing on the proposed site need to be relocated. • All affected areas, which are disturbed during the construction phase, need to be rehabilitated prior to the operational phase and should be continuously monitored by the Environmental Control Officer (ECO). • Implement, manage and monitor a grievance mechanism for the recording and management of social issues and complaints.
	Influx of jobseekers and change in population in the study area.	Negative High	Negative Medium	• Develop and implement a local procurement policy which prioritises “locals first” to prevent the movement of people into the area in search of work. • Engage with local community representatives prior to construction to facilitate the adoption of the locals first procurement policy. • Provide transportation for workers (from Pienaarsriver and surrounds) to ensure workers can easily access their place of employment and do not need to move closer to the project site.

				• Working hours should be kept between daylight hours during the construction phase, and / or as any deviation that is approved by the relevant authorities. • Compile and implement a grievance mechanism. • Appoint a Community Liaison Officer (CLO) to assist with the procurement of local labour. • Prevent the recruitment of workers at the site. • Implement a method of communication whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. • Establish clear rules and regulations for access to the proposed site. • Appoint a security company and implement appropriate security procedures to ensure that workers do not remain onsite after working hours. • Inform local community organisations and policing forums of construction times and the duration of the construction phase. • Establish procedures for the control and removal of loiterers from the construction site.
	Temporary increase in safety and security concerns associated with the influx of people	Negative Medium	Negative Low	• Working hours should be kept within daylight hours during the construction phase, and / or as any deviation that is approved by the relevant authorities. • Provide transportation for workers to prevent loitering within or near the project site outside of working hours. • The perimeter of the construction site should be appropriately secured to prevent any unauthorised access to the site. The

				fencing of the site should be maintained throughout the construction period. • The appointed EPC Contractor must appoint a security company to ensure appropriate security procedures and measures are implemented. • Access in and out of the construction site should be strictly controlled by a security company appointed to the project. • A CLO should be appointed as a grievance mechanism. A method of communication should be implemented whereby procedures to lodge complaints are set out for the local community to express any complaints or grievances with the construction process. • The EPC Contractor should implement a stakeholder management plan to address neighbouring farmer concerns regarding safety and security. • The project proposed must prepare and implement a Fire Management Plan; this must be done in conjunction with surrounding landowners. • The EPC Contractor must prepare a Method Statement which deals with fire prevention and management.
	Temporary increase in traffic disruptions and movement patterns.	Negative Medium	Negative Low	• All vehicles must be road worthy, and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues. • Heavy vehicles should be inspected regularly to ensure their road worthiness. • Provision of adequate and strategically placed traffic warning signs and control measures along the R709, R703 and gravel road to warn road users of the construction activities taking

				place for the duration of the construction phase. Warning signs must be always visible, especially at night. • Implement penalties for reckless driving to enforce compliance to traffic rules. • Avoid heavy vehicle activity during "peak" hours (when children are taken to school, or people are driving to work). • The developer and EPC Contractor must ensure that all fencing along access roads is maintained in the present condition or repaired if disturbed due to construction activities. • The developer and EPC Contractor must ensure that the roads utilised for construction activities are either maintained in the present condition or upgraded if disturbed due to construction activities. • The EPC Contractor must ensure that damage / wear and tear caused by construction related traffic to the access roads is repaired before the completion of the construction phase. • A method of communication must be implemented whereby procedures to lodge complaints are set out for the local community to express any complaints or grievances with the construction process.
	Nuisance impact (noise and dust)	Negative Medium	Negative Low	• The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays, and holiday periods where feasible. • Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.

				• Ensure all vehicles are road worthy, drivers are qualified and are made aware of the potential noise and dust issues. • A CLO should be appointed, and a grievance mechanism implemented.
	Increased risk of potential veld fires.	Negative Medium	Negative Low	• A firebreak should be implemented before the construction phase. The firebreak should be controlled and constructed around the perimeters of the project site. • Adequate fire-fighting equipment should be provided and readily available on site and all staff should be trained in firefighting and how to use the fire-fighting equipment. • No staff (except security) should be accommodated overnight on site and the contractor should ensure that no open fires are allowed on site. The use of cooking or heating implements should only be used in designated areas. • Contractors need to ensure that any construction related activities that might pose potential fire risks, are done in the designated areas where it is also managed properly. • Precautionary measures need to be taken during high wind conditions or during the winter months when the fields are dry. • The project will adhere to the National Forest and Veld Fires act and the fire management plan. It is recommended that the project proponent join the local fire association.
	Impacts on the sense of place	Negative Medium	Negative Low	• Implement mitigation measures identified in the Visual Impact Assessment (VIA) prepared for the project. • Limit noise generating activities to normal daylight working hours and avoid weekends and public holidays.

				• The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays, and holiday periods where feasible. • Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads 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. • Communication, complaints, and grievance channels must be implemented and contact details of the CLO must be provided to the local community in the site.
Traffic Impact Assessment (Appendix E9)	Construction and maintenance of gravel roads in vicinity of the site.	Negative Low	Negative Low	• Maintenance to lower order roads can be incorporated into the schedule, especially the maintenance of the road accessing the site. The site access road would require construction at the start of the construction project to safely transport the sensitive cargo through the site. A gravel roads maintenance programme for the gravel roads on site is recommended.
	Increased traffic on haulage routes.	Negative Low	Negative Low	• The impact of the increased traffic on regional routes can be mitigated by staggering trips and scheduling so that peak hour traffic in local towns is not impacted by construction traffic.
	Increased traffic on local routes (construction workers).	Negative Low	Negative Low	• The impact of the increased traffic on local routes can be mitigated by staggering trips and scheduling so that peak hour traffic in local towns is not impacted by construction traffic.

6.2.2 Impacts during the operational phase

During the operational phase the site will serve as a solar plant. The potential impacts will take place over a period of 20 – 25 years. During the operational phase the following activities will have various potential impacts on the biophysical and socio-economic environment:

- Activity 11(i) (GN.R. 327): *"The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."*
- Activity 1 (GN.R 325): *"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more."*
- Activity 28 (ii) (GN.R. 327): *"Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare."*

During the operational phase minor negative impacts are foreseen over the long term. The latter refers to at least a 20-year period. Table 6.4 summarizes the potentially most significant impacts and the mitigation measures that are proposed during the operational phase.

Table 6.4: Impacts and the mitigation measures during the operational phase

SPECIALIST STUDY	IMPACT	PRE-MITIGATION RATING	POST MITIGATION RATING	SUMMARY OF MITIGATION MEASURES
Terrestrial Ecology Baseline and Impact Assessment (Appendix E1)	Continued fragmentation and degradation of natural habitats and ecosystems.	Negative High	Negative Low	• All 'High' SEI habitats are to be avoided as far as possible. Demarcate work areas during the construction phase to avoid affecting outside areas. Use physical barriers e.g., safety tape, not painted lines, and use signage. • Indigenous vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion (Beatty et al, 2017; Sinha et al, 2018). • Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to the 'Very Low' and 'Low' sensitivity areas. • The clearing of vegetation must be minimized where possible. All activities must be restricted to within the authorised areas. It is recommended that areas to be developed be specifically and responsibly demarcated so that during the construction phase only the demarcated areas be impacted upon. • Existing access routes, especially roads, must be made use of. • Any materials may not be stored for extended periods of time and must be removed from the PAOI once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas.

				• A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. • Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. • No servicing of equipment on site unless necessary. • All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. • Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment. • Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem. • All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the project area. • It must be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants. • Consult a fire expert and compile and implement a fire management plan to minimise the risk of veld fires around the Project site

				• All construction waste must be removed from site at the closure of the construction phase.
	Continuing spread of IAP and weed species.	Negative High	Negative Low	• An Invasive Alien Plant Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in IAP composition. • The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths. • Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. A location specific waste management plan must be put in place to limit the presence of rodents and pests and waste must not be allowed to enter surrounding areas. • A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests due to the likely occasional presence of SCC.
	Ongoing displacement and direct mortalities of the faunal community (including possible SCC) due to continued disturbance (road collisions, noise, light, dust, vibration, poaching, erosion, etc.).	Negative Medium	Negative Low	• A qualified environmental control officer must be on site when activities begin. A site walk through is recommended by a suitably qualified ecologist prior to any activities taking place and any SSC or protected species should be noted. In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not

				move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated. • Clearing and disturbance activities must be conducted in a progressive linear manner, always outwards and away from the centre of the PAOI and over several days, so as to provide an easy escape route for all small mammals and herpetofauna. • The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this. • The duration of the activities should be minimized to as short a term as possible, to reduce the period of disturbance on fauna. • Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to reptile species and nocturnal mammals. • No trapping, killing, or poisoning of any wildlife is to be allowed and • Signs must be put up to enforce this. Monitoring must take place in this regard. • Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from any sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible. • All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of

				wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited. • Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons. • All vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. • Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. Should any holes remain open overnight they must be properly covered temporarily to ensure that no small fauna species fall in. Holes must be subsequently inspected for fauna prior to backfilling. • Fencing mitigations: • Top 2 strands must be smooth wire • Routinely re-tension loose wires • Minimum 30cm between wires • Place markers on fences. • Wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area. • Use environmentally friendly cleaning and dust suppressant products. • Once the development layout has been confirmed, the footprint area must be fenced off appropriately in segments pre-construction to allow animals to move or be moved out of these areas before breaking ground activities occur. Construction activities must take place systemically and the perimeter fence

				should not be completed (i.e., leaving sections unfenced to allow fauna to escape) until systematic clearing is completed. Drilling etc. should start one side of the site and progress towards the section of the site where fences are incomplete (away from the center of the PAOI). • <u>Dust:</u> • Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes the wetting of exposed soft soil surfaces. • No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.
	Additional general mitigation measures:			<u>Waste:</u> • Waste management must be a priority and all waste must be collected and stored effectively and responsibly according to a site-specific waste management plan. Dangerous waste such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible. • Litter, spills, fuels, chemical and human waste in and around the project area must be minimised and controlled according to the waste management plan. • Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan type concrete mixers be utilised. Any spills must be immediately contained and isolated from the natural environment, before being removed from site.

		• A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area. • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility within every 10 days at least. • Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site or buried on open pits. • Refuse bins will be responsibly emptied and secured. Temporary storage of domestic waste shall be in covered and secured waste skips. Maximum domestic waste storage period will be 10 days. <u>Environmental awareness training:</u> • All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. • Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species and sensitive habitat, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. • Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided. <u>Erosion:</u>

				• Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds. • Only existing access routes and walking paths may be made use of. • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc. • A stormwater management plan must be compiled and implemented.
Avifauna Impact Assessment (Appendix E2)	Destruction, fragmentation and degradation of habitats and ecosystems			• To be assessed as part of the EIR report following the dry assessment of the site.
	Direct mortality of avifauna			
	Reduced migration of avifauna			
	Environmental pollution due to water runoff, PV cleaning products, spills from vehicles and erosion			
	Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust, heat radiation and light pollution.			
	Staff and others interacting directly with avifauna (potentially dangerous) or poaching of birds/eggs			
Wetland Baseline and Risk Assessment (Appendix E3)	Potential for increased stormwater runoff leading to Increased erosion and sedimentation.	Negative Medium	Negative Low	• Design and implement an effective stormwater management plan. • Promote water infiltration into the ground beneath the solar panels. • Release only clean water into the environment.

				• Stormwater leaving the site should not be concentrated in a single exit drain but spread across multiple drains around the site each fitted with energy dissipaters (e.g. slabs of concrete with rocks cemented in). • Re-vegetate denuded areas as soon as possible. • Regularly clear drains. • Minimise the extent of concreted / paved / gravel areas. • A covering of soil and grass (regularly cut and maintained) below the solar panels is ideal for infiltration. If not feasible then gravel is preferable over concrete or paving. • Avoid excessively compacting the ground beneath the solar panels.
	Potential for increased contaminants entering the wetland systems.	Negative Medium	Negative Low	• Where possible minimise the use surfactants to clean solar panels and herbicides to control vegetation beneath the panels. If surfactants and herbicides must be used do so well prior to any significant predicted rainfall events.
Visual Impact Assessment (Appendix E8)	Visual impacts on sensitive visual receptors within a 1km radius from the SPP.	Negative Medium	Negative Low	Planning • Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint. • Where insufficient natural vegetation exists next to the property, a 'screen' can be planted using endemic, fast growers that are water efficient. Operations • Maintain general appearance of the facility as a whole.
	Visual impacts on sensitive visual receptors between a 1km and 3km radius from the SPP.	Negative Medium	Negative Low	
	Visual impacts on sensitive visual receptors between a 3km and 5km radius from the SPP.	Negative Low	Negative Low	

	Visual impact on observers travelling along the roads and residents at homesteads within a 5-10km radius of the SPP.	Negative Low	Negative Low	Planning • Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint. • Where insufficient natural vegetation exists next to the property, a 'screen' can be planted using endemic, fast growers that are water efficient. Operations • Maintain general appearance of the facility as a whole.
	Visual impacts of lighting at night on visual receptors in close proximity to the SPP.	Negative Medium	Negative Low	• Shield the source of light by physical barriers (walls, vegetation etc.) • Limit mounting heights of lighting fixtures, or alternatively use footlights or bollard level lights. • Make use of minimum lumen or wattage in fixtures. • Make use of down-lighters, or shield fixtures. • Make use of low-pressure sodium lighting or other types of low impact lighting. • Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes. • The use of night vision or thermal security cameras are very effective and can replace security lighting entirely.
	Significance of visual impacts of solar glint and glare as a visual distraction and possible air travel hazard of the SPP.	Negative Low	Negative Low	• No mitigation measures applicable.

	Visual impact and impacts on sense of place.	Negative Medium	Negative Low	• It is believed that renewable energy resources are essential to the environmental well- being of the country and planet (WESSA, 2012). Aesthetic issues are subjective, and some people find solar farms and their associated infrastructure pleasant and optimistic while others may find it visually invasive; it is mostly perceived as symbols of energy independence; and local prosperity. • The subjectivity towards the project in its entirety can be influenced by creating a "Green Energy" awareness campaign, educating the local community and potentially tourists on the benefits of renewable energy. This can be achieved by also hosting an 'open day' where the local community can have the opportunity to view the completed project which may enlist a sense of pride in the renewable energy project in their area. • Implement good housekeeping measures.
Soil and Agricultural Potential Assessment (Appendix E4)	Loss of Land Capability, Soil erosion and compaction effects	Negative Medium	Negative Low	• Continuously monitor erosion and compaction on site. • Monitor surface water runoff on site.
Social Impact Assessment (Appendix E7)	Creation of employment opportunities and skills development.	Positive Low	Positive Medium	• It is recommended that local employment policy is adopted to maximise the opportunities made available to the local community. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. • Vocational training programs should be established to promote the development of skills.

	Development of non-polluting, renewable energy infrastructure.	Positive Medium	Positive Medium	• No mitigation measures are proposed.
	Loss of agricultural land and overall productivity.	Negative Medium	Negative Low	• The proposed mitigation measures for the construction phase should have been implemented at this stage. • Mitigation measures from the Agricultural and Soil Compliance Statement, should also be implemented.
	Contribution to Local Economic Development (LED) and social upliftment.	Positive Medium	Positive High	• A Community Needs Analysis (CNA) must be conducted to ensure that the LED and social upliftment programmes proposed by the project are meaningful. • Ongoing communication and reporting are required to ensure that maximum benefit is obtained from the programmes identified, and to prevent the possibility for such programmes to be misused. • The programmes should be reviewed on an ongoing basis to ensure that they are best suited to the needs of the community at the time (bearing in mind that these are likely to change over time).
	Potential impacts related to the impact on tourism.	Low Positive	Low Positive	• Due to the extent of the project no viable mitigation measures can be implemented to eliminate the visual impact of the PV panels, but the subjectivity towards the PV panels can be influenced by creating a "Green Energy" awareness campaign, educating the local community and tourists on the benefits of renewable energy. Tourists visiting the area should be made aware of South Africa's movement towards renewable energy. This might create a positive feeling of a country moving forward in terms of environmental sustainability. This could be implemented by constructing a visitor's centre on the property

				allocated to the proposed solar farm which should be open to school fieldtrips, the local community, and tourists.
	Visual impact and impacts on sense of place.	Negative Medium	Negative Low	• To effectively mitigate the visual impact and the impact on sense of place during the operational phase of the proposed Oribi SPP, it is suggested that the recommendations made in the Visual Impact Assessment (specialist study) should be followed in this regard.
Traffic Impact Assessment (Appendix E9)	Increased traffic on local routes.	Negative Low	Negative Low	• The impact of the increased traffic during the operational phase is negligible due to the expected number of employees. The shift work provides a mitigation and reduces the expected number of employees, especially during peak hours.

6.2.3 Impacts during the decommissioning phase

The physical environment will benefit from the closure of the solar facility since the site will be restored to its natural state. Table 6.5 provides a summary of the impacts during the decommissioning phase. The decommissioning phase will however potentially result in impact on soils, pressure on existing service infrastructure, surface water and the loss of permanent employment. Skilled staff will be eminently employable, and a number of temporary jobs will also be created in the process. Decommissioning of a PV facility will leave a positive impact on the habitat and biodiversity in the area as the area will be rehabilitated to its natural state.

Table 6.5: Impacts and the mitigation measures during the decommissioning phase

SPECIALIST STUDY	IMPACT	PRE-MITIGATION RATING	POST MITIGATION RATING	SUMMARY OF MITIGATION MEASURES
Wetland Baseline and Risk Assessment (Appendix E3)	Potential loss or degradation of nearby wetlands through inappropriate closure.	Negative Medium	Negative Low	• Develop and implement a rehabilitation and closure plan. • Appropriately rehabilitate the project area by ripping, landscaping and re-vegetating with locally indigenous species.
Soil and Agricultural Potential Assessment (Appendix E4)	Erosion	Negative Low	Negative Low	• Implement an effective system of stormwater run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion. • Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.
	Top Soil	Negative Low	Negative Low	• If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.
Traffic Impact Assessment (Appendix E9)	Increased traffic.	Negative Low	Negative Low	• The impact of the increased traffic during the decommissioning phase is negligible due to the expected number of employees.

7 CUMULATIVE EFFECTS ASSESSMENT

This section aims to address the requirements of Section 2 of the NEMA to consider cumulative impacts as part of any environmental assessment process.

7.1 Introduction

The EIA Regulations (2017) determine that cumulative impacts, "*in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities*." Cumulative impacts can be incremental, interactive, sequential or synergistic. EIAs have traditionally failed to come to terms with such impacts, largely as a result of the following considerations:

- Cumulative effects may be local, regional or global in scale and dealing with such impacts requires coordinated institutional arrangements;
- Complexity - dependent on numerous fluctuating influencing factors which may be completely independent of the controllable actions of the proponent or communities; and
- Project level investigations are ill-equipped to deal with broader biophysical, social and economic considerations.

Despite these challenges, cumulative impacts have been afforded increased attention in this Scoping Report and for each impact a separate section has been added which discusses any cumulative issues, and where applicable, draws attention to other issues that may contextualise or add value to the interpretation of the impact (refer to Appendix E). This chapter analyses the proposed project's potential cumulative impacts in more detail by: (1) defining the geographic area considered for the cumulative effects analysis; (2) providing an overview of relevant past and present actions in the project vicinity that may affect cumulative impacts; (3) presenting the reasonably foreseeable actions in the geographic area of consideration; and (4) determining whether there are adverse cumulative effects associated with the resource areas analysed.

The term "Cumulative Effect" has for the purpose of this report been defined as: the summation of effects over time which can be attributed to the operation of the project itself, and the overall effects on the ecosystem of the project area that can be attributed to the project and other existing and planned future projects.

7.2 Geographic Area of Evaluation

The geographic area of evaluation is the spatial boundary in which the cumulative effects analysis was undertaken. The spatial boundary evaluated in this cumulative effects analysis generally includes an area of a 30km radius surrounding the proposed development (refer to Figure 7.1 below).

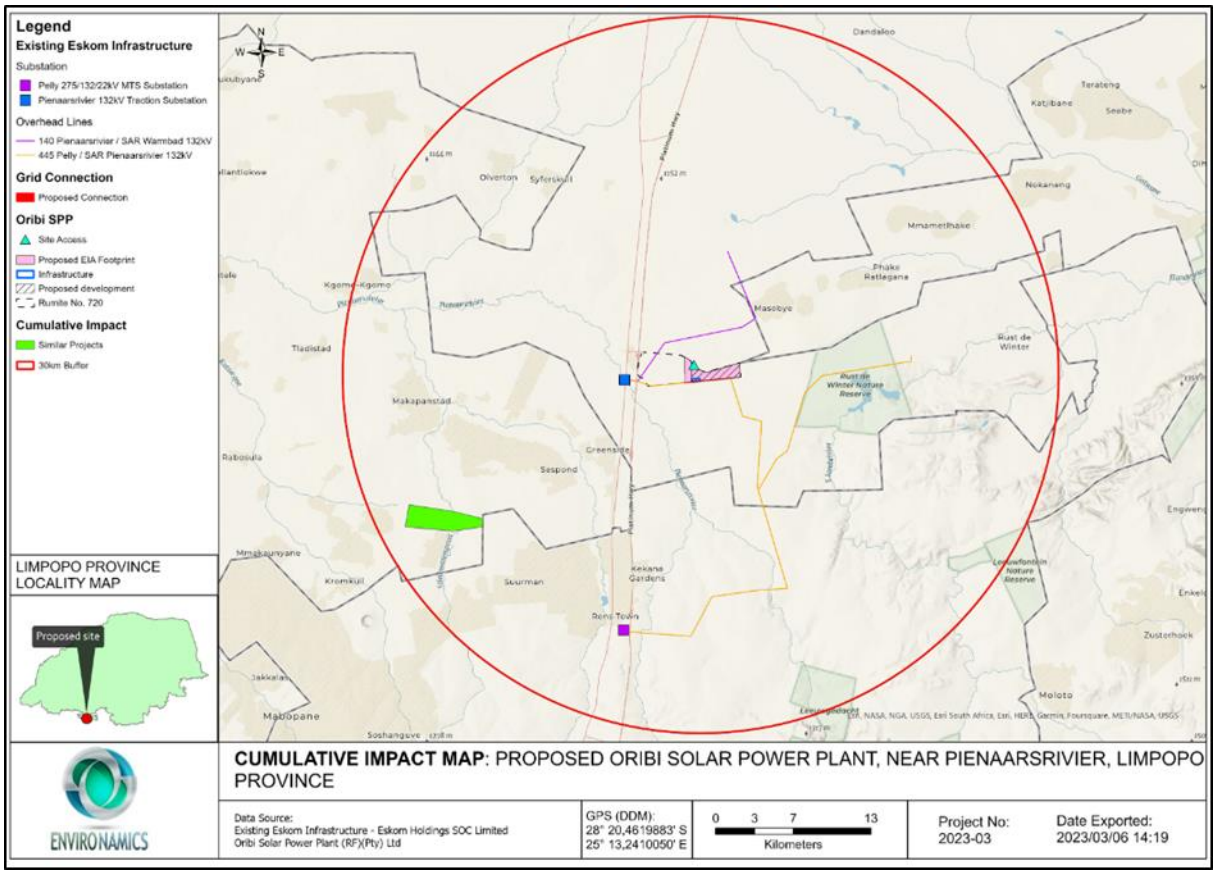


Figure 7.1: Geographic area of evaluation with utility-scale renewable energy generation sites and power lines

The geographic spread of PV solar projects, administrative boundaries and any environmental features (the nature of the landscape) were considered when determining the geographic area of investigation. It was argued that a radius of 30km would generally confine the potential for cumulative effects within this particular environmental landscape. The geographic area includes projects located within the Limpopo, North West and Gauteng Provinces. A larger geographic area may be used to analyse cumulative impacts based on the specific temporal or spatial impacts of a resource. For example, the socio-economic cumulative analysis may include a larger area, as the construction workforce may draw from a much wider area. The geographic area of analysis is specified in the discussion of the cumulative impacts for that resource where it differs from the general area of evaluation described above.

7.3 Temporal Boundary of Evaluation

A temporal boundary is the timeframe during which the cumulative effects are reasonably expected to occur. The temporal parameters for this cumulative effects analysis are the anticipated lifespan of the proposed project, beginning in 2025 and extending out at least 20 years, which is the minimum expected project life of the proposed project. Where appropriate, particular focus is on near-term cumulative impacts of overlapping construction schedules for proposed projects in the area of evaluation.

7.4 OTHER PROJECTS IN THE AREA

7.4.1 Existing projects in the area

According to the DFFE's database, one solar PV plant applications has been submitted to the Department within the geographic area of investigation (refer to Table 7.1).

Table 7.1: A summary of related projects that may have a cumulative impact, in a 30 km radius of the study area

Site name	Distance from study area	Proposed generating capacity	DEFF reference	EIA process	Project status
Moretele Solar Power Plant	21 km	100 MW	14/12/16/3/3/2/423	Scoping and EIA	Approved

It is unclear whether other projects not related to renewable energy is or has been or will be constructed in this area. In general, development activity in the area include residential areas, crop fields and farming activities. The next section of this report will aim to evaluate the potential for solar projects for this area in the foreseeable future.

7.5 SPECIALIST INFORMATION ON CUMULATIVE EFFECTS

In line with the Terms of Reference (ToR) provided as part of the scoping report, specialists were asked to, where possible, take into consideration the cumulative effects associated with the proposed development and other projects which are either developed or in the process of being developed in the local area (refer to Figure 7.2 for process flow). The following sections present their findings.

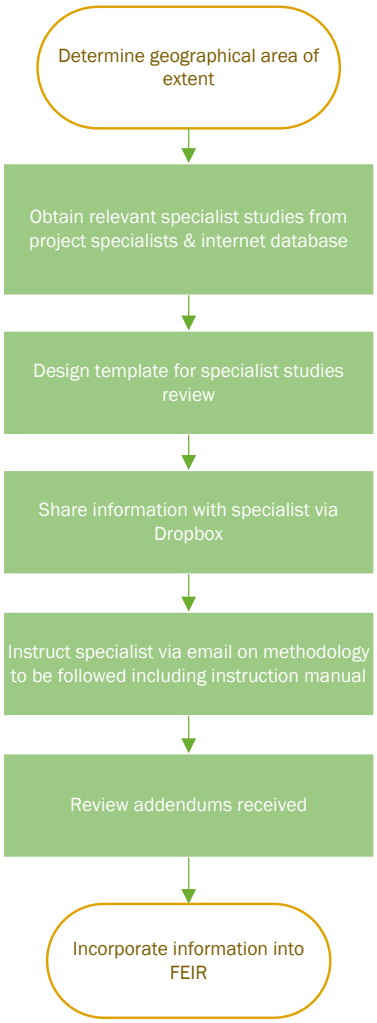


Figure 7.2: Process flow diagram for determining cumulative effects

7.5.1 Soil and Agricultural Potential

The cumulative impact of a development is the impact that development will have when its impact is added to the incremental impacts of other past, present or reasonably foreseeable future activities that will affect the same environment. It is important to note that the cumulative impact assessment for a particular project, like what is being done here, is not the same as an assessment of the impact of all surrounding projects. The cumulative assessment for this project is an assessment only of the impacts associated with this project, but seen in the context of all surrounding impacts. It is concerned with this project's contribution to the overall impact, within the context of the overall impact. But it is not simply the overall impact itself.

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable level of change to be exceeded in the surrounding area. If the impact of the development being assessed

does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of future agricultural production potential. The defining question for assessing the cumulative agricultural impact is this: What level of loss of future agricultural production potential is acceptable in the area, and will the loss associated with the proposed development, when considered in the context of all past, present or reasonably foreseeable future impacts, cause that level in the area to be exceeded?

In quantifying the cumulative impact, the area of land taken out of agricultural production (grazing) as a result of the proposed Oribi and Moretele Solar Power Plant development (total generation capacity of up to 250 MW) will amount to a total of approximately 625 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to only 0.002% of the surface area. That is within an acceptable limit in terms of loss of land which is largely suitable for grazing, of which there is no particular scarcity in the country. As previously indicated, the proposed development poses a low risk in terms of causing soil degradation because it can be fairly easily and effectively prevented by standard best practice soil degradation control measures, as recommended and included in the EMPr of the EIA Report. If the risk for each individual development is low, then the cumulative risk is also low.

Due to all of the considerations discussed above, the cumulative impact of loss of agricultural land use will not have an unacceptable negative impact on the agricultural production capability of the area. According to the Soil and Agriculture Potential Study (Appendix E4), the cumulative impacts have been scored “Low”, indicating that the potential incremental, interactive, sequential, and synergistic cumulative impacts are of low significance.

7.5.2 Ecology

The Terrestrial Ecology Baseline and Impact Assessment (refer to Appendix E1) states that cumulative impacts are assessed within the context of the extent of the proposed project area, other similar developments and activities in the area (existing and in-process), and general habitat loss and transformation resulting from any other activities in the area. Localised cumulative impacts include those from operations that are close enough (within 30 km) to potentially cause additive effects on the local environment or any sensitive receptors (relevant operations include nearby large road networks, other solar PV facilities, and power infrastructure). Relevant impacts include the overall reduction of foraging and nesting/burrowing habitat, dust deposition, noise and vibration, disruption of functional corridors of habitat important for movement and migration, disruption of waterways, groundwater drawdown, and groundwater and surface water quality depletion.

Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of conserved areas such as the adjacent game parks and reserves.

In order to spatially quantify the cumulative effects of the proposed development, the project in isolation is compared with the overall effects of surrounding development (including total transformation and transformation as a result of new and proposed developments of a similar type, i.e., solar). Note that this spatial assessment is only conducted for the proposed solar development footprint area, the powerline area is omitted.

The total area within the 30 km buffer around the PV development area amounts to 326658,72 ha, but when considering the transformation (113793.9 ha) that has taken place within this radius, 212864.8 ha of intact habitat remains according to the 2018 National Biodiversity Assessment. Therefore, the area within 30 km of the project has experienced approximately 34.8% loss in natural habitat.

The PV project footprint is 554.7 ha, and the other existing or approved PV projects that lie within the 30 km region that will remove intact habitat take up an area of 3435.29 (as per the latest South African Renewable Energy EIA Application Database).

This means that the total amount of remaining habitat lost as a result of all existing and/or approved solar projects in the region, including the proposed PV development, amounts to 1.87% (the sum of all related developments as a percentage of the total remaining habitat).

7.5.3 Avifauna

The cumulative impacts, when considering the existing transformation of the threatened habitats to croplands, in addition to the prevalence of planned solar developments, that increase the cumulative risks and, therefore, warrant mitigations. The mitigations to reduce cumulative impacts involve limiting the disturbance footprint (overall size), limiting human activity and noise throughout the project life, disturbing as little natural vegetation as possible, retaining the natural vegetation beneath the panels and around infrastructure, limiting the extent and width of roadways, reducing the speeds that vehicles travel, and then thoroughly rehabilitating the entire footprint back to natural grassland after decommissioning. Implementing successful mitigations would reduce the cumulative impacts of displacement of priority species by 32% to Medium-Negative, would reduce the cumulative impacts of displacement of resident avifauna by 24% to an acceptable Low-Negative score, and would reduce the cumulative impacts of loss of important avian habitats by 28% to Medium-Negative.

Despite some residual and cumulative impacts, there is no objection, from an avifaunal perspective, to the development of the proposed SPP development.

7.5.4 Social Impact Assessment

The Social Impact Assessment (refer to Appendix E7) indicate that from a social impact point of view the project represents an important development opportunity for the communities surrounding Oribi SPP. Should it be approved, it will not only supply the national grid with much needed clean power, but will also provide a number of opportunities for social upliftment. The cumulative impacts for each of the potential social impacts were assessed throughout the report. The most significant cumulative social impacts are both positive and negative: the community will have an opportunity to better their social and economic well-being, since they will have the opportunity to upgrade and improve skills levels in the area, but impacts on family and community relations 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.

7.5.5 Visual

The Visual Impact Assessment (refer to Appendix E8) confirmed that the construction and operation of the PV facility may increase the cumulative visual impact together with farming activities, dust on gravel roads, existing Eskom power line infrastructure and new projects in the area and other proposed solar power facilities in the area. The significance of the visual impacts can only be determined once projects have been awarded preferred bidder status. However, taking into account the already disturbed visual surrounds in the area and all the positive factors of such a development including economic factors, social factors and sustainability factors, the visual impact of this proposed development will be insignificant and is suggested that the development commence, from a visual impact point of view.

7.5.6 Heritage

The Heritage Impact Assessment (Refer to Appendix E5) concluded that from a review of available databases, publications, as well as available heritage impact assessments done for the purpose of developments in the region, it was determined that the Oribi SPP is located in an area with a very low presence of heritage sites and features.

The cultural heritage profile of the larger region is very low. Most frequently found are farmsteads, formal and informal burial sites. For this review, heritage sites located in urban areas have been excluded.

Heritage resources are sparsely distributed on the wider landscape with highly significant (Grade 1) sites being rare. Because of the low likelihood of finding further significant heritage resources in the area of the proposed for development and the generally low density of sites in the wider landscape the overall cumulative impacts to heritage are expected to be of generally low significance before mitigation.

For the project area, the impacts to heritage sites are expected to be of medium significance. However, this can be ameliorated by implementing mitigation measures, including isolating sites, relocating sites (e.g. burials) and excavating or sampling any significant archaeological material found to occur within the project area. The chances of further such material being found, however, are negligible. After mitigation, the overall impact significance would therefore be low.

7.5.7 Paleontology

According to the Palaeontological Impact Assessment (refer to Appendix E6), based on the SAHRIS website, the only palaeontological heritage assessments (PIAs) available for this region (Almond 2015, Brink undated, Groenewald 2013b, Millsteed 2013b) are all at desktop level with no field data. The cumulative Impacts of the area will include approved electrical facilities within a 30 km radius of the project site. As the mentioned MTS and Powerlines and corridors are all underlain by similar geology

the Impact on these developments will be similar. The Palaeontological Significance of the proposed Oribi SPP is rated as Low and the cumulative Impacts will thus also be Low Negative.

7.5.8 Traffic

According to the Traffic Impact Assessment (refer to Appendix E9) depending on the timing of the other nearby renewable energy projects, where construction in particular could overlap, traffic impact will increase accordingly. It should be noted that the volume of traffic is related to the specific development stage, logistics planning and development size.

The construction period for other renewable energy projects is relatively short (between 12 and 18 months), where traffic flow will vary during the construction period. It is assumed that 50% of these projects' construction periods would likely coincide with the Oribi SPP construction period. This additional traffic, however, will be widely dispersed and easily accommodated on the surrounding road network. In addition, the traffic impact of the operational and maintenance periods will be low/ negligible and it is also unlikely that the decommissioning of these projects will coincide with each other.

In conclusion, the cumulative impact and significance of the various nearby renewable energy projects is considered to have a low/ negligible impact and therefore no corrective measures will be required.

7.6 IMPACT ASSESSMENT

Following the definitions of the term, the "residual effects on the environment", i.e. effects after mitigation measures have been put in place, combined with the environmental effects of past, present and future projects and activities will be considered in this assessment. Also, a "combination of different individual environmental effects of the project acting on the same environmental component" can result in cumulative effects.

7.6.1 Potential Cumulative Effects

The receptors (hereafter referred to as Valued Ecosystem Components (VECs) presented in Section 6 (refer to the matrix analysis) have been examined alongside other past, present and future projects for potential adverse cumulative effects. A summary of the cumulative effects discussed are summarized in Table 7.2. There have been specific VECs identified with reference to the Solar Project (Table 6.2), which relates to the biophysical and socio-economic environments. Table 7.2 indicates the potential cumulative effects VECs and the rationale for inclusion/exclusion.

Table 7.2: Potential Cumulative Effects for the proposed project

	Valued Ecosystem Components (VECs)	Rationale for Inclusion / Exclusion	Level of Cumulative Effect
Construction Phase			
Terrestrial Biodiv	Loss of habitat, and disruption of surrounding ecological corridors. As	The construction phase of the development and associated infrastructure will result in loss of and damage to natural habitats if the vegetation is	- Medium

	well as the influences of pollution (water, noise, air, etc.).	cleared for the development of the solar plant. Rehabilitation of some areas would be possible but there is likely to be long-term damage in large areas. Most habitat destruction will be caused during the construction phase.	
Wetland Assessment	Impact on the characteristics of the watercourse	The construction activities associated with the proposed SPP will potentially have an impact on the wetland areas and water levels, whether it is through direct or indirect impacts. The clearance of vegetation for the SPP will either have a direct or indirect impact on the wetlands and smaller drainage channels. Loss of the riparian and in stream habitat will also result in permanent loss or displacement of the invertebrates, birds and small mammals' dependant on the wetland vegetation for feeding, shelter and breeding purposes. All functions associated with the wetland zones and the surrounding landscape will be compromised if mitigation measures are not applied correctly. Other indirect impacts of the construction of the SPP on the characteristics of the water course include impacts on water quality and changes to the geomorphology should the development cause impacts on downstream areas. The impact is considered to be cumulative due to proposed development impacting on the characteristics of the watercourse.	- Medium
	Soil erosion and sedimentation	The use of heavy machinery during the construction and decommissioning phases of the development will result in the compaction of soil, resulting in decreased infiltration of rainwater and increased surface run-off volumes and velocities leading to a greater erosion risk. The hardened surfaces of the road and compacted soils of the proposed development area will also lead to an increase in surface run-off during storm events which will likely be discharged via stormwater outlet points, concentrating flows leaving the exposed areas. This can lead to erosion in the cleared areas and channel forming where culverts concentrate water on the side of the road where the river and riverine area are located. It can lead to sedimentation, in the river. The impact is considered to be cumulative due to proposed development contributing to the risk of sediment transport and erosion in the area.	- Low

	Soil and water pollution (Spillages of harmful substances)	Construction work will also carry a risk of soil and water pollution, with large construction vehicles contributing substantially due to oil and fuel spillages. If not promptly dealt with, spillages or accumulation of waste matter can contaminate the soil and surface- or groundwater, leading to potential medium/long-term impacts on fauna and flora. The impact is considered to be cumulative due to proposed development contributing to the risk of soil and water pollution in the area.	- Low
	Spread and establishment of alien invasive species	The construction almost certainly carries by far the greatest risk of alien invasive species being imported to the site, and the high levels of habitat disturbance also provide the greatest opportunities for such species to establish themselves, since most indigenous species are less tolerant of disturbance. The biggest risk is that seeds of noxious plants may be carried onto the site along with materials that have been stockpiled elsewhere at already invaded sites. Continued movement of personnel and vehicles on and off the site, as well as occasional delivery of materials required for maintenance, will result in a risk of importation of alien species throughout the life of the project. Furthermore, the spread of the alien invasive species through the area will be accelerated when seeds are carried by stormwater into the drainage features on the site that will cause environmental degradation and indigenous species to be displaced. The wider area is already impacted by the spread of alien invasive species due to agricultural and mining activities. Therefore, the development will contribute towards the cumulative impact of spread of alien invasive species. The impact will be low as the mitigation measures proposed will reduce the overall impact of the development.	- Low
Avifaunal Impact Assessment	Displacement of priority avian species from important habitats	The displacement of resident avifauna through increased disturbance and possible collisions with PV panels leading to injury or loss of avian life are considered as a cumulative impact due to the large number of planned solar development in a 30 km radius.	- Medium

	Displacement of resident avifauna	The displacement of resident avifauna through increased disturbance and possible collisions with PV panels leading to injury or loss of avian life are considered as a cumulative impact due to the large number of planned solar development in a 30 km radius.	- Low
	Loss of important avian habitats	The loss of important avian habitats through increased disturbance are considered as a cumulative impact due to the large number of planned solar development in a 30 km radius.	- Medium
Agricultural and Soils Compliance Statement	Loss of agricultural land	The cumulative impact of loss of agricultural land use will not have an unacceptable negative impact on the agricultural production capability of the area. The proposed development is therefore acceptable in terms of cumulative impact, and it is therefore recommended that it is approved. Because of the negligible agricultural impact of grid connection infrastructure, its cumulative impact is also assessed as negligible.	- Low
Heritage Impact Assessment	Loss or damage to sites, features or objects of cultural heritage significance	The cultural heritage profile of the larger region is very limited. Most frequently found are stone artefacts, mostly dating to the Middle Stone Age. Sites containing such material are usually located along the margins of water features (pans, drainage lines), small hills and rocky outcrops. Such surface scatters or 'background scatter' is usually viewed to be of limited significance. The colonial period manifests largely as individual farmsteads, in all its complexity, infrastructure features such as roads, railways and power lines. For the purpose of this review, heritage sites located in urban areas have been excluded. Because of the low likelihood of finding significant heritage resources in the relevant area proposed for development and the generally low density of sites in the wider landscape the cumulative impacts to the heritage are expected to be of low significance.	- Low
Palaeontological Impact Assessment	Disturbance, damage or destruction of legally-protected fossil heritage within the development footprints during the construction phase (impacts on well-preserved and / or rare	A medium palaeontological significance has been allocated to the proposed development. It is therefore considered that the development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area.	- Medium

	fossils of scientific and conservation value)		
Social Impact Assessment	Impacts of employment opportunities, business opportunities and skills development	Oribi SPP and the establishment of other solar power projects within the area has the potential to result in significant positive cumulative impacts, specifically with regards to the creation of a number of socio-economic opportunities for the region, which in turn, can result in positive social benefits. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. The cumulative benefits to the local, regional, and national economy through employment and procurement of services are more considerable than that of Oribi SPP alone.	+ Medium
	Impact with large-scale in-migration of people	While the development of a single solar power project may not result in a major influx of people into an area, the development of several projects may have a cumulative impact on the in-migration and movement of people. In addition, the fact that the project is proposed within an area characterised by good levels of solar irradiation suitable for the development of commercial solar energy facilities implies that the surrounding area is likely to be subject to considerable future applications for PV energy facilities. Levels of unemployment, and the low level of earning potential may attract individuals to the area in search of better employment opportunities and higher standards of living. It is exceedingly difficult to control an influx of people into an area, especially in a country where unemployment rates are high. It is therefore important that the project proponent implement and maintain strict adherence with a local employment policy in order to reduce the potential of such an impact occurring.	- Medium

Traffic Impact Study	Increase in construction vehicles	The construction and decommissioning phases are the only significant traffic generators for renewable energy projects. The duration of these phases is short term (i.e. the impact of the generated traffic on the surrounding road network is temporary and renewable energy facilities, when operational, do not add any significant traffic to the road network). Even if all renewable energy projects within the area are constructed at the same time, the roads authority will consider all applications for abnormal loads and work with all project companies to ensure that loads on the public roads are staggered and staged to ensure that the impact will be acceptable.	- Low
Operational Phase			
Terrestrial Biodiversity Impact Assessment	Habitat destruction & Fragmentation	The development and associated infrastructure will result in loss of and damage to natural habitats if the vegetation is cleared for the development of the solar plant. Rehabilitation of some areas would be possible but there is likely to be long-term damage in large areas. Most habitat destruction will be caused during the construction phase.	- Medium
	Soil erosion and sedimentation	The development may result in widespread soil disturbance and is usually associated with accelerated soil erosion. Soil erosion promotes a variety of terrestrial ecological changes associated with disturbed areas, including the establishment of alien invasive plant species, altered plant community species composition and loss of habitat for indigenous flora. The impact is considered as cumulative as it will influence the vegetation communities in the area.	- Low
	Dust pollution	The environmental impacts of wind-borne dust, gases and particulates from the operation and maintenance activities associated with the proposed development are primarily related to human health and ecosystem damage. Poor air quality results in deterioration of visibility and aesthetic landscape quality of the region, particularly in winter due to atmospheric inversions. The impact is considered to be cumulative as dust pollution has an impact on the surrounding environment and as the surrounding area is already impacted by mining and agricultural activities.	- Low

	Spillages of harmful substances	Maintenance work for the proposed development will always carry a risk of soil and water pollution. If not promptly dealt with, spillages or accumulation of waste matter can contaminate the soil and surface or ground water, leading to potential medium/long-term impacts on fauna and flora. The impact is considered to be cumulative as the spillages of harmful substances can have indirect impacts to the surrounding environment.	- Low
	Spreading of alien invasive species	Continued movement of vehicles on and off the site will result in a risk of importation of alien species. The biggest risk is that seeds of noxious plants may be carried onto the site along with materials that have been stockpiled elsewhere at already invaded sites. Movement of vehicles will however be reduced during operation and maintenance of the facility.	- Low
	Negative effect of human activities on fauna and flora and road mortalities on fauna	Continued movement of vehicles on and off the site will result in a risk of importation of alien species. The biggest risk is that seeds of noxious plants may be carried onto the site along with materials that have been stockpiled elsewhere at already invaded sites. The wider area is already impacted by the spread of alien invasive species due to agricultural and mining activities. Therefore, the development will contribute towards the cumulative impact of spread of alien invasive species. The impact will be low as the mitigation measures proposed will reduce the overall impact of the development.	- Low
Wetland/Riparian Assessment	Impact on the characteristics of the watercourse	The operation and maintenance activities associated with the proposed SPP will potentially have an impact on the wetland areas and water levels, whether it is through direct or indirect impacts. All functions associated with the wetland zones and the surrounding landscape will be compromised if mitigation measures are not applied correctly. Other indirect impacts o include impacts on water quality and changes to the geomorphology should the development cause impacts on downstream areas. The impact is considered to be cumulative due to proposed development impacting on the characteristics of the watercourse.	- Medium
	Soil erosion and sedimentation	The hardened surfaces of the road and compacted soils of the proposed development area will lead to an increase in surface run-off during storm events which will likely be discharged via stormwater outlet	- Low

		points, concentrating flows leaving the exposed areas. This can lead to erosion in the cleared areas and channel forming where culverts concentrate water on the side of the road where the river and riverine area are located. It can lead to sedimentation, in the river. The impact is considered to be cumulative due to proposed development contributing to the risk of sediment transport and erosion in the area.	
	Soil and water pollution (Spillages of harmful substances)	Maintenance work will also carry a risk of soil and water pollution, with large construction vehicles (where used) contributing substantially due to oil and fuel spillages. If not promptly dealt with, spillages or accumulation of waste matter can contaminate the soil and surface- or groundwater, leading to potential medium/long-term impacts on fauna and flora. The impact is considered to be cumulative due to proposed development contributing to the risk of soil and water pollution in the area.	- Low
	Spread and establishment of alien invasive species	Continued movement of personnel and vehicles on and off the site, as well as occasional delivery of materials required for maintenance, will result in a risk of importation of alien species throughout the life of the project. Furthermore, the spread of the alien invasive species through the area will be accelerated when seeds are carried by stormwater into the drainage features on the site that will cause environmental degradation and indigenous species to be displaced. The wider area is already impacted by the spread of alien invasive species due to agricultural and mining activities. Therefore, the development will contribute towards the cumulative impact of spread of alien invasive species. The impact will be low as the mitigation measures proposed will reduce the overall impact of the development.	- Low
Visual Impact Assessment	Visual intrusion of the development on observers within the area	The operation and maintenance of the facility will create visual instruction on observers that utilise and travel through the area, including travellers using the local roads	- Medium
Decommissioning Phase			

General	Generation of waste	During the decommissioning of the facility waste will be generated that will need to be disposed of where recycling and re-use is not available. This may lead to pressure on waste disposal facilities in the area.	- Medium

7.7 CONCLUSION

This chapter of the Scoping Report addressed the cumulative environmental effects of the construction, operation and decommissioning project phases to be further assessed as part of the EIA Phase. The information to date has shown that no significant adverse residual impacts are likely. However, cumulative impacts could arise as other similar projects are constructed in the area.

The potential most significant cumulative impacts relate to:

- Cumulative effects during construction phase:
  - Loss of habitat, and disruption of surrounding ecological corridors. As well as the influences of pollution (water, noise, air, etc.) (- Medium)
  - Impact on the characteristics of the watercourse (- Medium)
  - Displacement of priority avian species from important habitats (- Medium)
  - Loss of important avian habitats (- Medium)
  - Disturbance, damage or destruction of legally-protected fossil heritage within the development footprints during the construction phase (impacts on well-preserved and / or rare fossils of scientific and conservation value) (- Medium)
  - Impacts of employment opportunities, business opportunities and skills development (+ Medium)
  - Impact with large-scale in-migration of people (- Medium)
- Cumulative effects during the operational phase:
  - Habitat destruction and fragmentation (- Medium)
  - Impacts on the characteristics of the watercourse (- Medium)
  - Visual intrusion (- Medium)
- Cumulative effects during the decommissioning phase:
  - Generation of waste (- Medium)

The cumulative impact for the proposed development is medium to low and no high, unacceptable impacts related to the project are expected. Considering the extent of the project and information presented in section 7 of this report, it can be concluded that the cumulative impacts will not result in large scale changes and impacts on the environment.

Photovoltaic solar energy technology is a clean technology which contributes toward a better-quality environment. The proposed project will contribute to local economic growth by supporting industry development in line with provincial and regional goals and ensuring advanced skills are drawn to the Limpopo Province. No cumulative impacts with a high residual risk have been identified.

In terms of the desirability of the development of sources of renewable energy therefore, it may be preferable to incur a higher cumulative loss in such a region as this one (where the landscape has already experienced degradation), than to lose land with a higher environmental value elsewhere in the country.

8 PLAN OF STUDY FOR EIA

This section aims to address the following requirements of the regulations:

Appendix 2. (2) A scoping report (...) must include -

(i) a plan of study for undertaking the EIA 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;

(ii) a description of the aspects to be assessed as part of the EIA process;

(iii) aspects to be assessed by specialists;

(iv) a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;

(v) a description of the proposed method of assessing duration and significance;

(vi) an indication of the stages at which the competent authority will be consulted;

(vii) particulars of the public participation process that will be conducted during the EIA process; and

(viii) a description of the tasks that will be undertaken as part of the EIA 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.

8.1 INTRODUCTION

This section gives a brief outline of the Plan of Study for EIA (PoSEIA) and the tasks that will be undertaken and the anticipated process to meet the objectives for the EIA phase. The approach to the EIA is to focus on those key issues identified for the preferred alternative. This will ensure that the EIA focuses on the most significant impacts and in the process save time and resources.

8.2 ANTICIPATED OUTCOMES OF THE IMPACT ASSESSMENT PHASE

The purpose of the EIA phase is to assess issues identified in the scoping phase and will include an environmental management program (EMPr). The EMPr will provide information on the proposed activity and the manner in which potential impacts will be minimized or mitigated. The EIA report will comply with Appendix 3 and will:

- 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;
- Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

- Identify the location of the development footprint within the preferred site 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;
- 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;
- Identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- Identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- Identify suitable measures to avoid, manage or mitigate identified impacts; and
- Identify residual risks that need to be managed and monitored.

8.3 TASKS TO BE UNDERTAKEN

The following sections describe the tasks that will be undertaken as part of the EIA Phase of the process.

8.3.1 Project Description

Further technical and supporting information will be gathered to provide a more detailed project description. This will include a detailed and finalised site layout plan that will be compiled once the areas of sensitivity identified in this Scoping Report have been confirmed by the specialists.

8.3.2 Consideration of alternatives

The following project alternatives will be investigated in the EIR:

- Design/Layout alternatives: In terms of the actual layout of the proposed PV plant which will only be assessed for the preferred site alternative. A Final facility layout is included in Figure H.

8.3.3 Compilation of Environmental Impact Report (EIR)

A Final EIR will be compiled to meet the content requirements as per Appendix 3 of GNR. 326 of the EIA Regulations (as amended) and will also include a Final Environmental Management Programme containing the aspects contemplated in Appendix 4 of GNR326. The Generic EMPr for overhead electricity transmission and distribution infrastructure and the Generic EMPr for the development of

the associated substation infrastructure for transmission and distribution of electricity as per Government Notice 435, which were published in Government Gazette 42323 on 22 March 2019, will also be included in the Final EIR.

8.3.4 Public participation

All registered I&APs and relevant State Departments will be given the opportunity to review the Final Environmental Impact Report in accordance with Regulation R326. A minimum of 30 days commenting period will be allowed and all stakeholders and I&APs will be given an opportunity to forward their written comments within that period. All issues identified during this 30-day review and comment period will be documented and compiled into a Comments and Response Report to be included as part of the Final EIR to be submitted to the DFFE for decision-making on the Application for Environmental Authorisation.

8.4 ASPECTS ASSESSED

Table 8.1 below provides a summary of the aspects that have been assessed. The aspects are also linked to specialist information obtained.

Table 8.1: Aspects assessed

Aspects	Potential impacts	Specialist studies / technical information
Construction of the PV Solar facility	• Impacts on the fauna and flora	Terrestrial Biodiversity Survey and Avifauna Impact Assessment
	• Wetlands and riparian areas	Wetland Baseline and Risk Assessment
	• Impacts on agricultural potential (soils)	Soil and Agricultural Compliance Statement
	• Impacts on existing services infrastructure	Confirmation from the Local Municipality
	• Temporary employment, impacts on health and safety	Social Impact Assessment
	• Traffic impacts	Traffic Impact Assessment
	• Impacts on heritage resources	Heritage Impact Assessment and Palaeontological Impact Assessment
Operation of the PV Solar facility	• Impacts on the fauna and flora	Terrestrial Biodiversity Survey and Avifauna Impact Assessment

	• Wetlands and riparian areas	Wetlands and riparian areas
	• Impacts on agricultural potential (soils)	Soil and Agricultural Compliance Statement
	• Increased consumption of water	Confirmed volumes to be provided by the Applicant
	• Visual Impact	Visual Impact Assessment
	• Provision of employment and generation of income for the local community	Social Impact Assessment
Decommissioning of the PV Solar facility	• Wetlands and riparian areas	Wetland Baseline and Risk Assessment
	• Socio-economic impacts (loss of employment)	Social Impact Assessment
Cumulative Impacts	• Cumulative biophysical impacts resulting from similar developments in close proximity to the proposed activity.	All independent specialist studies results to be considered and analyzed by the EAP

8.4.1 Specialist studies

Based on the initial descriptions of potential environmental impacts or aspects (refer to Table 6.2), specialists have been subcontracted to assess the potential impacts that may be significant. The specialist studies assess impacts on both the social and the biophysical environment and also help in identifying ways that can help to mitigate the envisaged impacts. The following specialist studies have been included to address the potentially most significant impact as identified during the scoping phase – refer to Table 6.2:

- Heritage Impact Assessment: To determine whether the proposed activity will impact on any heritage or archeological artifacts.
- Terrestrial Biodiversity, Plant and Animal Species Impact Assessment: To determine what the impact of the proposed activity will be on the ecology (fauna and flora) in the area.
- Wetland Baseline and Risk Assessment: To determine the impact of the proposed activity on the wetlands present on the farm Ruimte No. 720.
- Avifauna Impact Assessment: To determine what the impacts of the proposed activity will have on the birds (avifauna) in the area.
- Visual Impact Assessment: To determine to what extent the proposed activity will be visually intrusive to the surrounding communities or other receptors.

- Soil and Agricultural Potential Study: To determine how the proposed activity will impact on soil and agricultural resources.
- Social Impact Assessment: To determine how the proposed activity will impact on the socio-economic environment.
- Palaeontological Impact Assessment: To determine the impacts on palaeontological resources.
- Traffic Impact Assessment: To determine the impacts on road users on long haul routes and roads around the project area.

8.4.2 Terms of reference for specialist studies

Specialists in their field of expertise will consider baseline data and identify and assess impacts according to predefined rating scales (section 8.5). Specialists will also suggest optional or essential ways in which to mitigate negative impacts and enhance positive impacts. Further, specialists will, where possible, take into consideration the cumulative effects associated with this and other projects which are either developed or in the process of being developed in the local area. The specialist is reminded to follow the latest DFFE protocols.

The results of these specialist studies have been integrated into the Final Scoping Report. The general requirements proposed for the inputs are presented below and specialists are encouraged to comment and provide input on these. The Terms of Reference (ToR) for each specialist study are included as Appendix E10 to the report.

General Requirements

Specialists' reports must comply with Appendix 6 of GNR. 326 published under sections 24(5), and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and whereby the following are to be included:

- The details of-
    - the specialist who prepared the report; and
    - the expertise of that specialist to compile a specialist report including a curriculum vitae;
- A declaration that the specialist is independent in a form as may be specified by the competent authority;
- An indication of the scope of, and the purpose for which, the report was prepared;
    - An indication of the quality and age of base data used for the specialist report;
    - A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;
- The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;

- A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;
- Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;
- An identification of any areas to be avoided, including buffers;
- A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;
- A description of any assumptions made and any uncertainties or gaps in knowledge;
- A description of the findings and potential implications of such findings on the impact of the proposed activity, or activities;
- Any mitigation measures for inclusion in the EMPr;
- Any conditions for inclusion in the environmental authorisation;
- Any monitoring requirements for inclusion in the EMPr or environmental authorisation;
- A reasoned opinion-
    - whether the proposed activity, activities or portions thereof should be authorised;
        - regarding the acceptability of the proposed activity or activities; and
    - if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;
- A description of any consultation process that was undertaken during the course of preparing the specialist report;
- A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and
- Any other information requested by the competent authority.

In addition to the above, specialists are expected to:

- Review the Scoping Report, with specific reference to the Comments and Response Report to familiarize with all relevant issues or concerns relevant to their field of expertise;
- In addition to the impacts listed in the Scoping Report, identify any issue or aspect that needs to be assessed and provide expert opinion on any issue in their field of expertise that they deem necessary in order to avoid potential detrimental impacts;
- Assess the degree and extent of all identified impacts (including cumulative impacts) that the preferred project activity and its proposed alternatives, including that of the no-go alternative, may have;

- Identify and list all legislation and permit requirements that are relevant to the development proposal in context of the study;
- Reference all sources of information and literature consulted; and
- Include an executive summary to the report.

8.5 METHOD OF ENVIRONMENTAL ASSESSMENT

The environmental assessment aims to identify the various possible environmental impacts that could results from the proposed activity. Different impacts need to be evaluated in terms of its significance and in doing so highlight the most critical issues to be addressed.

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in Table 8.2.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

8.5.1 Impact Rating System

Impact assessment must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the project phases:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact the following criteria is used:

Table 8.2: The rating system

NATURE
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.

GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not

		occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		

1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity. The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.

51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

8.6 CONSULTATION WITH THE COMPETENT AUTHORITY

Consultation with the competent and commenting authorities will continue throughout the duration of impact assessment phase. The authorities will also comment on whether they deem it necessary to conduct additional specialist studies other than what is proposed already in this PoSEIA. On-going consultation will include:

- Submission of the Final EIR following a 30-day public review period (and consideration of comments received).
- Arrangements will be made to discuss the report with the Environmental Officer responsible for the project during the review period, where required.

9 CONCLUSION

This Final Scoping Report is aimed at identifying the 'scope' of the EIA that will be conducted in respect of the activity for which authorization is being applied for. It can be concluded that:

- The scoping phase complied with the specifications set out in Regulations 21 and Appendix 2 of GNR326.
- All key consultees have been consulted as required by the Regulations 39 to 44.

Based on the contents of the report the following key environmental issues were identified which need to be addressed in the EIA report. Note that significance indicated is prior to mitigation.

- Impacts during construction phase:
  - Impacts on fauna and flora including 1) destruction, loss and fragmentation of habitats, ecosystems and the vegetation community (- High), 2) introduction of Invasive Alien Plant (IAP) species and invasive fauna (- Medium), 3) displacement of the indigenous faunal community (- Medium)
  - Direct disturbance / degradation / loss to wetland soils or vegetation (- Medium) and increased erosion and sedimentation (- Medium)
  - Visual impact of construction activities on sensitive visual receptors in close proximity to the SPP (- Medium)
  - Destroy or permanently seal-in fossils at or below the surface that are then no longer available for scientific study (- Medium)
  - Social impacts including 1) creation of direct and indirect employment opportunities (+ Medium), 2) economic multiplier effects from the use of local goods and services (+ Medium), 3) potential loss in productive farmland (- Medium), 4) influx of jobseekers and change in population in the study area (- High), 5) temporary increase in safety and security concerns associated with the influx of people (- Medium), 6) temporary increase in traffic disruptions and movement patterns (- Medium), 7) nuisance impact (noise and dust) (- Medium), 8) increased risk of potential veld fires (- Medium), and (9) impacts on the sense of place (- Medium).
- Impacts during the operational phase:
  - Impacts on fauna and flora including 1) continued fragmentation and degradation of natural habitats and ecosystems (- High), 2) continuing spread of IAP and weed species (- High) and 3) ongoing displacement and direct mortalities of the faunal community (- Medium)
  - Potential for increased stormwater runoff leading to Increased erosion and sedimentation (- Medium) and potential for increased contaminants entering the wetland systems (- Medium)

- Visual impacts including 1) visual impacts on sensitive visual receptors within a 1km radius from the SPP (- Medium), (2) visual impacts on sensitive visual receptors between a 1km and 3km radius from the SPP (- Medium), (3) visual impacts of lighting at night on visual receptors in close proximity to the SPP, and (4) visual impact and impacts on sense of place.
- Loss of Land Capability, soil erosion and compaction effects (- Medium)
- Social impacts including 1) creation of employment opportunities and skills development (+ Medium), 2) development of non-polluting, renewable energy infrastructure (+ Medium), and 3) contribution to Local Economic Development (LED) and social upliftment (+ High)

- Impacts during the decommissioning phase:
  - Potential loss or degradation of nearby wetlands through inappropriate closure (- Medium)
- Cumulative biophysical impacts resulting from similar development in close proximity to the proposed activity.

No fatal flaws or impacts of a high significance will remain after the implementation of the proposed mitigation measures. The issues identified will be addressed in more detail in the EIA report as part of the EIA Phase.

Considering the environmental sensitive features present within the development footprint, as identified in this Scoping Report, the Applicant has proposed a Final facility layout which considers these features, and thereby aim to avoid any direct impact on these features. As part of this optimisation process associated infrastructure has been shifted outside of these sensitive environmental features and areas. The Final layout will be further assessed and optimised as part of the EIA Phase of the project to ensure that the development footprint within the affected property is appropriate from an environmental perspective, and thereby avoids the present sensitive environmental features and areas as identified by the independent specialists. Refer to Figure H for the Final layout proposed for development.

The EAP therefore recommends that:

The scoping report be approved after which the EIA process, as required by Regulations 23 to 24 may commence.

We trust that the Department of Forestry, Fisheries and the Environment find the report in order and we eagerly await your comments in this regard.

Mr. Herman Alberts
Environamics Environmental Consultants

10 REFERENCES

ACTS see SOUTH AFRICA

ANON. nd. Guidelines for Environmental Impact Assessments. http://redlist.sanbi.org/eiaguidelines.php

BELA-BELA LOCAL MUNICIPALITY: Final Integrated Development Plan 2022 – 2026.

BELA-BELA LOCAL MUNICIPALITY: Spatial Development Framework 2018.

BODEN, T.A., G. MARLAND, and R.J. ANDRES. 2011. Global, Regional, and National Fossil-Fuel CO2 Emissions. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., U.S.A.

BOTHA, A. J. 2023. The proposed Oribi Solar Power Plant near Pienaarsriver, Limpopo Province. Visual Impact Assessment.

BOTHA, A. J. 2023. The proposed Oribi Solar Power Plant near Pienaarsriver, Limpopo Province. Social Impact Assessment.

STEYN, L. 2022. The Terrestrial Ecology Baseline and Impact Assessment for the proposed Oribi Solar Power Plant Project.

CONSTITUTION *see* SOUTH AFRICA. 1996.

DEPARTMENT OF ENERGY (DoE). Integrated Resource Plan 2010-2030

DEPARTMENT OF MINERALS AND ENERGY (DME). 2003. White Paper on Renewable Energy.

ENERGY BLOG. 2015. Energy Blog – Project Database. [Web:] http://www.energy.org.za/knowledge-tools/project-database?search=project lookup&task=search [Date of assess: 28 September 2015].

FIRST SOLAR. 2011. PV Technology comparison.

INTERNATIONAL FINANCE CORPORATION (IFC). 2012. International Finance Corporation's Policy on Environmental and Social Sustainability.

IFC & WORLD BANK GROUP. 2007. Environmental, Health, and Safety General Guidelines.

KEMP, R. 2023. Oribi Solar Power Plant (SPP) – Avifauna Site Sensitivity Verification.

LAVIN, J. 2023. Heritage Impact Assessment In terms of Section 38(8) of the NHRA for the Proposed Oribi BESS and SPP.

LIMPOPO: Development Plan 2020 – 2025.

LIMPOPO PROVINCIAL: Spatial Development Framework 2022.

MOHAPI, M. 2023. Soil and Agricultural Potential Assessment for the proposed Oribi Solar Power Plant. Pienaarsriver, Limpopo Province.

MTSHWENI, K. 2023. Wetland Baseline & Risk Assessment for the proposed Oribi Solar Power Plant. Pienaarsriver, Limpopo Province, South Africa.

MUCINA, L. AND RUTHERFORD, M.C. 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

NATIONAL DEPARTMENT OF AGRICULTURE. 2006. Development and Application of a Land Capability Classification System for South Africa.

NERSA. 2009. South Africa Renewable Energy Feed-in Tariff (REFIT) – Regulatory Guidelines.

SANBI. 2016. Guidelines for Environmental Impact Assessments. [Web:] http://redlist.sanbi.org/eiaguidelines.php. Date of access: 26 April 2016.

SOLARGIS. 2011. Global Horizontal Irradiation (GHI). [Web:] http://solargis.info/doc/71 [Date of access: 7 May 2014].

SOUTH AFRICA (a). 1998. The Conservation of Agricultural Resources Act, No. 85 of 1983. Pretoria: Government Printer.

SOUTH AFRICA. 1996. Constitution of the Republic of South Africa as adopted by the Constitutional Assembly on 8 May 1996 and as amended on 11 October 1996. (B34B-96.) (ISBN: 0-260-20716-7.)

SOUTH AFRICA (a). 1998. The National Environmental Management Act, No. 107 of 1998. Pretoria: Government Printer.

SOUTH AFRICA (b). 1998. The National Water Act, No. 36 of 1998. Pretoria: Government Printer.

SOUTH AFRICA. 1999. The National Heritage Resources Act, No. 25 of 1999. Pretoria: Government Printer.

SOUTH AFRICA. 2004. The National Environment Management: Air Quality Act, No. 39 of 2004. Pretoria: Government Printer.

SOUTH AFRICA (a). 2008. The National Energy Act, No. 34 of 2008. Pretoria: Government Printer.

SOUTH AFRICA (b). 2008. The National Environmental Management: Waste Act, No. 59 of 2008. Pretoria: Government Printer.

SOUTH AFRICA. 2010. Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998. (GNR. 543, 544 and 545. 2010.). Pretoria: Government Printer.

SOUTH AFRICA. Minister in the Presidence: Planning (2009). *Medium Term Strategic Framework. – A Framework to guide Governments Programme in the Electoral Mandate Period 2009-2014*.

SWINGLER, S. 2006. Statistics on Underground Cable in Transmission networks, Final Report of CIGRE Working Group B1.07.

TARRANT, A. 2023. Traffic Impact Study for the transportation of Solar Energy Equipment to the Oribi Solar Power Plant near Pienaarsriver, Limpopo Province.

WATERBERG DISTRICT MUNICIPALITY: Final Integrated Development Plan 2020 – 2021.

WATERBERG DISTRIC TMUNICIPALITY: Spatial Development Framework 2021.

WORLD BANK GROUP. 2006. The Equator Principles.