DFFE Reference Number: 14/12/16/3/3/2/2340

Tournée 2 Solar (Pty) Ltd

TOURNÉE 2 SOLAR PV FACILITY AND ASSOCIATED INFRASTRUCTURE, NEAR STANDERTON, MPUMALANGA

Draft Environmental Impact Assessment Report

AUGUST 2023

PUBLIC

Tournée 2 Solar (Pty) Ltd

TOURNÉE 2 SOLAR PV FACILITY AND ASSOCIATED INFRASTRUCTURE, NEAR STANDERTON, MPUMALANGA

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Draft Environmental Impact Assessment Report

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GENERAL SITE INFORMATION

Technical details of the proposed Tournée 2 Solar PV Facility		
Location of Site	Near Standerton in the Mpumalanga Province	
Description of all affected farm portions and 21 digit SG Codes	**Farm Name**	**21-Digit SG Code**
	Remaining Portion of Portion 3 of Farm Dwars-in-die-Weg 350 IS	T0IS00000000035000003
	Portion 6 of Farm Dwars-in-die-Weg 350 IS	T0IS00000000035000006
Extent	573.78 ha	
Buildable Area	Approximately 297 Ha	
Design Specifications		
Solar Field	▪ Contracted Capacity: 150MW ▪ PV Solar Energy Facility including bifacial solar PV modules, installed on single axis tracker mounting structures at a height of up to 6m above ground level, and inverters and transformers	
Site Substation and BESS	▪ Total footprint will be up to 7ha in extent (4ha for the BESS and 3ha for the IPP portion of the substation) ▪ The back-to-back substation (including facility substation, and Eskom collector/switching station) will consist of a high voltage substation yard to allow for multiple 132kV feeder bays and transformers, control buildings, telecommunications infrastructure, and access roads: 30 000 m² ▪ The Battery Energy Storage System's main components include the batteries installed in rows of containers, the power conversion system (inverters) and transformers. The capacity will be up to 150MW/600MWh. Area required: 40,000 m²	
Operation and Maintenance (O&M) Building Infrastructure	▪ O&M building infrastructure will be required to support the functioning of the Solar PV Facility and for services required by operations and maintenance staff. The O&M building infrastructure will include: • Operations building (including workshop and stores) of approximately 1 500m²; • Refuse area for temporary waste storage and conservancy tanks to service ablution facilities.	
Construction Camp Laydown	Building infrastructure of up to a maximum height of 8m will be located within the project area. The infrastructure includes: ▪ Temporary infrastructure includes: • Typical construction camp area 100m x 50m: 5 000m² • Typical laydown area 100m x 200m: 20 000m² • Temporary cement batching plant: Gravel and sand will be stored in separate heaps whilst the cement will be contained in a silo: 30 000 m²	

	• Sewage: Septic tanks and portable toilets
Access Road	▪ Access to the proposed Tournée 2 Solar PV Facility from the R39 or R38 towards the site ▪ Access Road: Up to 8m width ▪ Internal roads: Up to 4m in width ▪ Internal road length: Up to 20km
Associated Infrastructure	▪ Cables - Communication, AC and DC cables installed underground and overhead. AC cabling up to 33kV between project components ▪ An up to 132kV interconnecting Overhead Powerline ▪ The final interconnection solution will be dependent on the requirements of Eskom, which are still to be defined. ▪ 2 500 m² Paved areas ▪ Fencing around development area

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GLOSSARY

Abbreviation	Definition
AC	Alternating current
AEL	Atmospheric Emissions License
AIS	Alien and Invasive Species
ATNS	Air Traffic and Navigation Services
BESS	Battery Energy Storage System
BMS	Battery Management System
CA	Competent authority
CAA	Civil Aviation Authority
CARA	Conservation of Agricultural Resources Act (No. 43 of 1983)
CBA	Critical Biodiversity Area
CHSSP	Community Health, Safety and Security Plan
CCIA	Climate Change Impact Assessment
CSP	Concentrated Solar Power
DALRRD	Department of Agriculture Land Reform and Rural Development
DC	Direct current
DFFE	Department of Forestry, Fisheries and Environment
DMRE	Department of Mineral Resources and Energy
DR	District roads
DSR	Draft Scoping Report
DWS	Department of Water & Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act 73 of 1989
ECO	Environmental Control Officer

Abbreviation	Definition
EHS	Environmental Health and Safety
EI&ES	Ecological Importance and Ecological Sensitivity
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPFI	Equator Principles Financial Institutions
ERA	Electricity Regulation Act (No. 4 of 2006)
ESA	Ecological Support Area
FI	Financial institutions
GA	General Authorisation
GHG	Greenhouse gas
GIIP	Good international industry practice
GNR	Government Notice Regulation
GSDM	Gert Sibande District Municipality
ha	Hectares
HIA	Heritage Impact Assessment
IBA	Important Bird & Biodiversity Area
ICAO	International Civil Aviation Organisation
IEP	National Integrated Energy Plan
IFC	International Finance Corporation
IRP	Integrated Resource Plan
LLM	Lekwa Local Municipality
LUPA	Land Use Planning Act (Act 3 of 2014)
MBCP	Mpumalanga Biodiversity Conservation Plan
MEGDP	Mpumalanga Economic Growth and Development Path
MIDP	Mpumalanga Industrial Development Plan
MW	Megawatt

Abbreviation	Definition
NDP	National Development Plan
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act 39 of 2004
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMPAA	National Environmental Management Protected Areas Act (No. 57 of 2003)
NHRA	National Heritage Resource Act (Act No. 25 of 1999)
NID	Notification of Intent to Develop
NPAES	National Protected Area Expansion Strategy 2010
NR	National Routes
NWA	National Water Act, 1998 (Act No. 36 of 1998)
O&M	Operational and maintenance
OHSA	Occupational Health and Safety Act (No. 85 of 1993)
PCS	Power Conditioning System
PICC	Presidential Infrastructure Coordinating Commission
PPP	Public Participation Process
PS	Performance Standards
PV	Photovoltaic
REC	Recommended ecological condition
REDZ	Renewable Energy Development Zones
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
RFI	Radio Frequency Interference
S&EIA	Scoping and EIA
SABS	South African Bureau of Standards
SACAA	South African Civil Aviation Authority
SAHRA	South African Heritage Resources Agency
SAHRA	South African Heritage Resources Agency
SALA	Subdivision of Agricultural Land Act

Abbreviation	Definition
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency
SANS	South African National Standards
SARPs	Standards and Recommended Practices
SAWS	South African Weather Service
SDF	Spatial Development Frameworks
SDG	Sustainable Development Goals
SEF	Solar Energy Facilitates
SEP	Stakeholder Engagement Plan
SER	Stakeholder Engagement Report
SG	Surveyor General
SKA	Square Kilometre Array
TOPs	Threatened or Protected Species
Tournée 2	Tournée 2 Solar (Pty) Ltd
UNDP	United Nations' Development Programmes
WBG	World Bank Group
WSP	WSP Group Africa (Pty) Ltd
WUA	Water Use Authorisation
WUL	Water Use License

1 INTRODUCTION

WSP Group Africa (Pty) Ltd (WSP) has been appointed by Tournée 2 Solar (Pty) Ltd (Tournée 2), to undertake an Environmental Impact Assessment (EIA) to meet the requirements under the National Environmental Management Act (Act 107 of 1998) (NEMA), for the proposed 150 megawatt (MW) Tournée 2 Solar Photovoltaic (PV) Facility located near Standerton in the Mpumalanga Province (**Figure 1-1**).

The proposed development is subject to a Scoping and EIA (S&EIA) Process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) (as amended) and Appendix 2 and 3 of the EIA Regulations, 2014 promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017. The competent authority for this S&EIA Process is the national Department of Forestry, Fisheries and Environment (DFFE).

1.1 PURPOSE OF THIS REPORT

The Scoping and EIA (S&EIA) process is an interdisciplinary procedure to ensure that environmental and social considerations are included in decisions regarding projects. Simply defined, the process aims to identify the possible environmental and social effects of a proposed activity and how those impacts can be mitigated.

This environmental impact report (EIR) aims to provide stakeholders with information on the proposed development including location, layout and technological alternatives, the scope of the environmental assessment and key impacts identified in the environmental assessment, and the consultation process undertaken through the EIA process.

1.2 BACKGROUND INFORMATION

The proposed project includes the development of the Tournée 1 & 2 Solar PV Facilities near Thuthukani in the Mpumalanga Province (**Figure 1-1**). The Tournée Solar PV Facilities will include two 150MW Solar Energy Facilities (SEFs). **This report is specific to the Tournée 2 Solar PV Facility**.

The proposed project will be applied for under a Special Purpose Vehicle and the Project Applicant is therefore Tournée 2 Solar (Pty) Ltd. The proposed Solar PV Facility will connect to a nearby Eskom substation (still to be confirmed) through an up to 132kV single or double circuit powerline. The powerline will subject to a separate BA process for environmental authorisation.

The Cluster is being developed in the context of the Renewable Energy Independent Power Producer Procurement Programme (REIPPP), in conjunction with private off-take or wheeling agreements, where possible.

It is understood that Red Rocket has a corporate Environmental and Social Management System (ESMS) which aligns with the Equator Principles, the International Funding Corporation (IFC) Performance Standards (PS) and applicable World Bank/IFC Environmental, Health and Safety (EHS) and Sector specific Guidelines and applicable Good International Industry Practice (GIIP). All Red Rocket's renewable energy projects, from inception, development, construction, operation, and any decommissioning are required to comply with the requirements and expectations of the ESMS. The Tournée 2 Solar PV Facility does not fall within a Renewable Energy Development Zone (REDZ).

Figure 1-1 – Regional locality map of Tournée 2 Solar PV Facility

1.3 DETAILS OF KEY ROLE PLAYERS

1.3.1 PROJECT PROPONENT

Tournée 2 Solar (Pty) Ltd is the project proponent (Applicant) with regards to this application for the construction and operation of the Tournée 2 Solar PV Facility. **Table 1-1** provides the relevant details of the project proponent.

Table 1-1 – Details of Project Proponent

Proponent:	Tournée 2 Solar (Pty) Ltd
Contact Person:	Matteo Giulio Luigi Brambilla
Postal Address	Postnet Suite 150, Private Bag X3, Roggebaai, Cape Town
Telephone:	021 418 3940
Email:	m.logan@redrocket.energy

1.3.2 COMPETENT AUTHORITY

Section 24C(2)(a) of NEMA stipulates that the Minister of Forestry, Fisheries and the Environment ("the Minister") must be identified as the competent authority if the activity has implications for international environmental commitments or relations. GN 779 of 01 July 2016 identifies the Minister as the CA for the consideration and processing of environmental authorisations and amendments thereto for activities related to the Integrated Resource Plan (IRP) 2010 – 2030.

The Tournée 2 Solar PV Facility is part of the Eskom Phase 1 Land Leasing projects within the Mpumalanga Province. As per the letter from Mpumalanga Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA) dated 20 June 2023 and from the DFFE dated 25 May 2023 (**Appendix J**), the DFFE is confirmed as being the CA for the projects associated with the Eskom Phase 1 Land Leasing Projects.

The proposed Tournée 2 Solar PV Facility is also related to the IRP.

Table 1-2 provides the relevant details of the competent authority on the Project.

Table 1-2 – Competent Authority

Aspect	Competent Authority	Contact Details
Competent Authority: Environmental Authorisation	Department of Forestry, Fisheries, and the Environment (DFFE)	Case Officer: Makhosi Yeni Integrated Environmental Authorisations Email: myeni@dffe.gov.za

1.3.3 COMMENTING AUTHORITY

The commenting authorities for the project include:

- Department of Water and Sanitation (DWS);
- Department of Mineral Resources and Energy (DMRE);

- Department of Agriculture, Land Reform and Rural Development (DALRRD);
- MDARDLEA;
- Mpumalanga Tourism and Parks Agency (MTPA);
- Department of Public Works;
- Department of Defence;
- National Department of Transport;
- South African National Roads Agency Limited (SANRAL);
- South African Heritage Resources Agency (SAHRA);
- South African Civil Aviation Authority (CAA);
- Square Kilometre Array (SKA);
- South African Weather Service (SAWS);
- Lekwa Local Municipality (LLM);
- Gert Sibande District Municipality (GSDM);
- BirdLife South Africa;
- Endangered Wildlife Trust (EWT); and
- South African National Parks.

Refer to the Stakeholder Engagement Report (SER) in **Appendix D** for a full list of commenting authorities.

1.3.4 ENVIRONMENTAL ASSESSMENT PRACTITIONER

WSP was appointed in the role of Independent EAP to undertake the S&EIA process for the proposed project. The CV of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 1-3** details the relevant contact details of the EAP.

Table 1-3 – Details of the EAP

EAP:	WSP Group Africa (Pty) Ltd
Contact Person:	Ashlea Strong
Physical Address:	Building C, Knightsbridge, 33 Sloane Street, Bryanston, Johannesburg
Postal Address:	P.O. Box 98867, Sloane Park 2151, Johannesburg
Telephone:	011 361 1392
Fax:	011 361 1301
Email:	Ashlea.Strong@wsp.com
EAP Qualifications:	▪ Masters in Environmental Management, University of the Free State ▪ B Tech, Nature Conservation, Technikon SA ▪ National Diploma in Nature Conservation, Technikon SA
EAPASA Registration Number:	EAPASA (2019/1005)

Statement of Independence

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal or other interest that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the Assessment.

1.3.5 SPECIALISTS

Specialist input was required in support of this application for EA. The details of the specialists are provided in **Table 1-4** below. The specialist studies are attached in **Appendix H** and their declarations in **Appendix C**.

Table 1-4 – Details of Specialists

Assessment	Name of Specialists	Company	Sections in Report	Specialist Report attached as
Air Quality Compliance Statement	▪ Kirsten Collett	WSP Group Africa (Pty) Ltd	▪ Section 3.6	**Appendix H.1**
Noise Compliance Statement	▪ Kirsten Collett	WSP Group Africa (Pty) Ltd	▪ Section 3.6	**Appendix H.2**
Soil, Landuse and Land Capability Assessment	▪ Stephen van Staden ▪ Tshiamo Setsipane ▪ Braveman Mzila	Zimpande Research Collaborative	▪ Section 3.6 ▪ Section 7.1.1 ▪ Section 8.1 ▪ Section 9.1 ▪ Section 10.1 ▪ Section 11.2.1	**Appendix H.3**
Freshwater Assessment	▪ Kristen Nienaber ▪ Stephen van Staden ▪ Faith Mamphoka	Scientific Aquatic Services (Pty) Ltd	▪ Section 3.6 ▪ Section 7.2.1 ▪ Section 8.1.2 ▪ Section 9.2 ▪ Section 10.2 ▪ Section 11.2.2	**Appendix H.4**
Terrestrial Biodiversity Assessment	▪ Charne Gouws ▪ Hennie de Beer ▪ Christien Steyn ▪ Paul da Cruz ▪ Samantha Leigh Daniels ▪ Stephen van Staden	Scientific Terrestrial Services (Pty) Ltd	▪ Section 3.6 ▪ Section 7.2.1 ▪ Section 7.2.3 ▪ Section 7.2.4 ▪ Section 8.1.2 ▪ Section 8.1.4 ▪ Section 8.1.5	**Appendix H.5**
Terrestrial Biodiversity: Floral Assessment	▪ Charne Gouws ▪ Christien Steyn ▪ Samantha Leigh Daniels	Scientific Terrestrial Services (Pty) Ltd	▪ Section 3.6 ▪ Section 7.2.3 ▪ Section 8.1.4 ▪ Section 9.3 ▪ Section10.3	Appendix H.14
Terrestrial Biodiversity: Faunal Assessment	▪ Hennie de Beer ▪ Paul da Cruz ▪ Stephen van Staden	Scientific Terrestrial Services (Pty) Ltd	▪ Section 3.6 ▪ Section 7.2.4 ▪ Section 8.1.5 ▪ Section 9.4	

Assessment	Name of Specialists	Company	Sections in Report	Specialist Report attached as
			▪ Section 10.4 ▪ Section 11.2.5	
Avifaunal Assessment	▪ Low de Vries ▪ Justin Nicolau ▪ Colyn Grobler ▪ Matthew Wood	Volant Environmental (Pty) Ltd	▪ Section 3.6 ▪ Section 7.2.5 ▪ Section 8.1.6 ▪ Section 9.5 ▪ Section 10.2 ▪ Section 11.2.6	**Appendix H.6**
Bats Scoping Survey	▪ Low de Vries ▪ Colyn Grobler	Volant Environmental (Pty) Ltd	▪ Section 3.6 ▪ Section 7.2.6	**Appendix H.7**
Heritage Impact Assessment	▪ Jenna Lavin	CTS Heritage	▪ Section 3.6 ▪ Section 7.3.1 ▪ Section 8.1.7 ▪ Section 9.6 ▪ Section 10.5 ▪ Section 11.2.7	**Appendix H.8**
Archaeological Specialist Study	▪ Jenna Lavin ▪ Heidi Fivaz ▪ Sky-Lee Fairhurst (of Ubique Heritage Consultants)	CTS Heritage	▪ Section 3.6 ▪ Section 7.3.1 ▪ Section 8.1.7 ▪ Section 9.6 ▪ Section 10.5 ▪ Section 11.2.7	Appendix 1 of Heritage Impact Assessment (Appendix H.8)
Palaeontological Impact Assessment	▪ Prof Marion Bamford	Independent (Sub-contracted by CTS Heritage)	▪ Section 3.6 ▪ Section 7.1.2 ▪ Section 7.3.2 ▪ Section 8.1.8 ▪ Section 9.7	Appendix 2 of Heritage Impact Assessment (Appendix H.8)
Transport Impact Assessment	▪ Iris Wink	iWink Consulting (Pty) Ltd	▪ Section 3.6 ▪ Section 7.3.3 ▪ Section 9.8 ▪ Section 10.6 ▪ Section 11.2.9	**Appendix H.9**
Visual Impact Assessment	▪ Sanja Erwee ▪ Stephen van Staden	Scientific Aquatic Services (Pty) Ltd	▪ Section 3.6 ▪ Section 7.3.4 ▪ Section 8.1.9 ▪ Section 9.9 ▪ Section 10.7 ▪ Section 11.2.10	**Appendix H.10**
Social Impact Assessment	Tony Barbour	Tony Barbour Environmental Consulting	▪ Section 3.6 ▪ Section 7.3.7 ▪ Section 9.10 ▪ Section 10.8 ▪ Section 11.2.11	**Appendix H.11**
Geotechnical Desktop Study	▪ Nthabiseng Mashego ▪ Heather Davis	WSP Group Africa (Pty) Ltd	▪ Section 3.6 ▪ Section 9.11	**Appendix H.12**
High Level Safety	▪ Debra Mitchell	ISHECON cc	▪ Section 3.6	**Appendix H.13**

Assessment	Name of Specialists	Company	Sections in Report	Specialist Report attached as
Health and Environmental Risk Assessment			▪ Section 7.4 ▪ Section 9.12 ▪ Section 11.2.12	

1.4 IMPACT ASSESSMENT TERMS OF REFERENCE

The 2014 EIA Regulations (GNR 982), as amended, identifies the proposed Tournée 2 Solar PV Facility as an activity being subject to an S&EIR process due to the applicability of the EIA Listing Notices 1 and 2 (GNR 983 and 984, as amended). In order for the project to proceed it will require an Environmental Authorisation (EA) from DFFE.

WSP has been appointed as the independent EAP to carry out the S&EIR process in accordance with the EIA Regulations, 2014, as amended in 2017.

The Scoping Process has been completed and involved consultation with interested and affected parties and the drafting of the Plan of Study (PoS) for EIA, which culminated in the submission of a Final Scoping Report (FSR) to the DFFE. The DFFE acceptance of the FSR and authorisation to proceed with the EIR was received on 19 June 2023 (**Appendix G**). The final EIR is due to the DFFE on **03 October 2023**.

This draft EIAR will be made available for public comment from **18 August 2023 to 18 September 2023**.

As defined in Appendix 3 of GNR 982, as amended, the objective of the impact assessment process is to, through a consultative process:

- 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—
  - Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
- Degree to which these impacts-
  - Can be reversed;
  - May cause irreplaceable loss of resources, and
  - 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.

Public participation is a requirement of the S&EIR process; it consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIR decision-making process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the Proposed Project. The objectives of the public participation process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the Proposed Project;
- Clearly outline the scope of the Proposed Project, including the scale and nature of the existing and proposed activities;
- Identify viable Proposed Project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the Proposed Project, issues and solutions.

1.5 OBJECTIVES OF THE S&EIA PROCESS AS PER THE PROCEDURAL FRAMEWORK

The S&EIR process consists of various phases with associated timelines as defined in GNR 982. The process can generally be divided into four main phases, namely, (i) a Pre-application Phase, (ii) an Application and Scoping Phase (current phase), (iii) an Impact Assessment Phase and (iv) Authorisation and Appeal Phase.

The main objectives of the phases can be described as follows:

- Pre-Application Phase (**Completed**):
  - Undertake consultation meetings with the relevant authorities to confirm the required process, the general approach to be undertaken and to agree on the public participation plan;
  - Identify stakeholders, including neighbouring landowners/residents and relevant authorities;
- Application and Scoping Phase (**Completed**):
  - Compile and submit application forms to the CA and pay the relevant application fees;
  - Compile a DSR describing the affected environment and present an analysis of the potential environmental issues and benefits arising from the proposed project that may require further investigation in the Impact Assessment Phase;
  - Develop draft terms of reference for the specialist studies to be undertaken in the Impact Assessment Phase; and
  - Inform stakeholders of the proposed project, feasible alternatives and the S&EIR process and afford them the opportunity to register and participate in the process and identify any issues and concerns associated with the proposed project.
  - Incorporate comments received from stakeholders during the DSR comment period;

- Should significant amendments be required, release the updated DSR for a 30-day comment period to provide stakeholders with the opportunity to review the amendments as well as provide additional input if required; and
- Submit the FSR, following the consultation period, to the relevant authorities, in this case the DFFE, for acceptance/rejection.

- Impact Assessment Phase (**Current**):
  - Continue to inform and obtain contributions from stakeholders, including relevant authorities, stakeholders, and the public and address their relevant issues and concerns;
  - Assess in detail the potential environmental and socio-economic impacts of the project as defined in the DSR;
  - Identify environmental and social mitigation measures to avoid and/or address the identified impacts;
  - Develop and/or amend environmental and social management plans based on the mitigation measures developed in the Environmental Impact Assessment Report (EIAR);
  - Submit the EIAR and the associated EMPr to the CA to undertake the decision making process;
  - Authorisation and Appeal Phase;
  - The DFEE to provide written notification of the decision to either grant or refuse EA for the proposed project; and
  - Notify all registered stakeholders of the decision and right to appeal.

1.6 IMPACT ASSESSMENT REPORT STRUCTURE

Table 1-5 cross-references the sections where the legislated requirements as per Appendix 3 of GNR 982 of 2014 can been located within the EIR.

Table 1-5 – Legislated Report Requirements as detailed in GNR 982

Appendix 3	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
(a)	Details of	
	the EAP who compiled the report; and	Section 1.3.4 **Appendix A**
	the expertise of the EAP, including a Curriculum Vitae	**Appendix A**
(b)	The location of the activity, including-	
	The 21-digit Surveyor code for each cadastral land parcel;	Section 4.1
	Where available, the physical address and farm name	Section 4.1
	Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property.	N/A
(c)	A plan which locates the proposed activities applied for at an appropriate scale, or, if it is-	
	A linear activity, a description of the corridor in which the proposed activity or activities is to be undertaken; or	N/A
	On land where the property has not been defined, the coordinates	N/A

Appendix 3	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
	within which the activity is to be undertaken.	
(d)	A description of the proposed activity, including-	
	All listed and specified activities triggered and being applied for;	Section 3.5
	A description of the associated structures and infrastructure related to the development;	Section 7
(e)	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Section 6
(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 4.6
(h)	A full description of the process followed to reach the proposed development footprint within the approved site, including-	
	Details of the development footprint alternatives considered;	Section 5
	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 3.5
	A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	**Appendix D**
	The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 7
	The impacts and risks identified 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.	Section 9
	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	Section 3.4
	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 9
	The possible mitigation measures that could be applied and level of residual risk;	Section 9
	If no alternative development locations for the activity were investigated, the motivation for not considering such; and	Section 5
	A concluding statement indicating the preferred alternative development location within the approved site.	Section 5

Appendix 3	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including-	
	A description of all environmental issues and risks that were identified during the environmental impact assessment process; and;	Section 9
	An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	Section 9
(j)	An assessment of each identified potentially significant impact and risk, including-	
	Cumulative impacts;	Section 10
	The nature, significance and consequences of the impact and risk;	Section 8
	The extent and duration of the impact and risk;	Section 9
	The probability of the impact and risk occurring;	Section 9
	The degree to which the impact and risk can be reversed;	Section 9
	The degree to which the impact and risk may cause irreplaceable loss of resources; and	Section 9
	The degree to which the impact and risk can be mitigated.	Section 9
(k)	Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.	Section 11.2
(l)	An environmental impact statement which contains-	
	A summary of the key findings of the environmental impact assessment:	Section 11
	A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and	Section 11.4
	A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	Section 11
(m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.	Section 11
(n)	The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment.	Section 5
(o)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section 11.3
(p)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.	Section 3.6

Appendix 3	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
(q)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Section 11.3
(r)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised.	N/A
(s)	An undertaking under oath or affirmation by the EAP in relation to-	
	The correctness of the information provided in the report;	**Appendix B**
	The inclusion of comments and inputs from stakeholders and I&APs;	**Appendix B**
	The inclusion of inputs and recommendations from the specialist reports where relevant; and	**Appendix B**
	Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.	**Appendix B**
(t)	where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	N/A
(u)	An indication of any deviation from the approved scoping report, including the plan of study, including-	N/A
	any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and	N/A
	a motivation for the deviation	N/A
(v)	Any specific information required by the competent authority; and	N/A
(w)	Any other matter required in terms of section 24(4)(a) and (b) of the Act	N/A

2 SCOPING PHASE SUMMARY

2.1 PROCEDURAL PROCESS

The application form was compiled and submitted to the DFFE on 24 March 2023. The application form was acknowledged on 28 March 2023. The application form was updated and submitted to the DFFE on 05 May 2023 with the FSR and was acknowledged on 05 May 2023.

The DFFE reference number allocated to this application is 14/12/16/3/3/2/2340. This reference number will appear on all official correspondence with the authorities and the public regarding the Proposed Project. A copy of the acknowledgement of receipt of the application is included in the SER (**Appendix D**).

The Draft Scoping Report (DSR) was released for public review between 27 March 2023 to 02 May 2023. Subsequently the scoping report was finalised and submitted to the DFFE on 05 May 2023 for their review and approval. The submission of the final scoping report was within 44 days of receipt of the application by the DFFE as required by GNR 982.

The approval of the Final Scoping Report (FSR) and the PoS for the EIA was received on 19 June 2023 and is included in **Appendix G.**

2.2 AUTHORITY CONSULTATION

A pre-application meeting was held on 27 February 2023 with the DFFE in order to discuss the proposed project. The minutes of this meeting are included in **Appendix D**. In addition, WSP notified a number of commenting authorities of the Proposed Project via a notification letter, these included:

- DWS;
- DFFE;
- DFFE: Biodiversity Conservation
- DFFE: Protected Areas
- DMRE;
- DALRRD;
- Department of Public Works;
- National Department of Transport;
- SANRAL;
- SAHRA;
- CAA;
- SKA;
- SAWS;
- BirdLife South Africa;
- LLM;
- GSDM;
- Mpumalanga DWS: Vaal Proto CMA- Water Quality Management;
- Mpumalanga Department of Social Development;
- Mpumalanga Department of Public Works, Roads and Transport;
- Mpumalanga Department of Co-Operative Governance and Traditional Affairs;
- Mpumalanga Heritage Resources Authority;

- Department of Defence Force Mpumalanga;
- Transnet Freight Rail;
- Eskom;
- South African National Biodiversity Institute;
- MTPA;
- MDARDLEA; and
- EWT.

WSP received comments on the DSR from the DFFE on 18 April 2023, and approval on the FSR on 19 June 2023. The comments and responses are included in Section 3 of the SER (**Appendix D**).

2.3 STAKEHOLDER CONSULTATION

Stakeholders were identified and will continue to be identified through several mechanisms. These include:

- Utilising existing databases from other projects in the area;
- Networking with local business owners, non-governmental agencies, community based organisations, and local council representatives;
- Field work in and around the project area;
- Advertising in the press;
- Placement of community notices;
- Completed comment sheets; and
- Attendance registers at meetings.

All Stakeholders identified to date have been registered on the project stakeholder database. The EAP endeavoured to ensure that individuals/organisations from referrals and networking were notified of the Proposed Project. Stakeholders were identified at the horizontal (geographical) and vertical extent (organisations level).

A list of stakeholders captured in the project database is included in Appendix A of the SER (**Appendix D**).

2.3.1 STAKEHOLDER NOTIFICATION

2.3.1.1 Direct Notification

Notification of the proposed Project was issued to potential and existing Stakeholders, via direct correspondence (i.e., site notices, emails, SMSs, etc.). Proof of notification is included in the SER (**Appendix D**).

2.3.1.2 Newspaper Advertisements

In accordance with the requirements of GNR 982, as amended, the proposed project was advertised in Two local newspapers. The purpose of the advertisement is to notify the public about the proposed project and to invite them to register as stakeholders. A copy of the advertisement and proof of placement is included in the SER. The advertisement publication details are provided in **Table 2-1**.

Table 2-1 – Dates on which the adverts were published

Newspaper	Distribution Area	Language	Publication Date
Standerton Bulletin	Bethal, Ermelo, Greylingstad, Morgenzon, Sakhile, Secunda, Standerton, Trichardt, Volksrust	English	23 March 2023
Standerton Advertiser	Standerton, Morgenzon, Charl Cilliers, Balfour, Greylingstad	English, Afrikaans & isiZulu	21 March 2023

2.3.1.3 Site Notices

In accordance with GNR 326 Section 41(2)(a-b) site notices have been developed (see Appendix B-3) and have been placed at strategic points in close proximity to the proposed Project site, as well as in public places within LLM and GSDM. The site notices were placed on site on 27 March 2023. Proof of placement is included in the SER (**Appendix D**).

2.3.1.4 Availability of the Draft Scoping Reports

The Draft Scoping Reports were placed on public review for a period of at least 30 days from **27 March 2023** to **02 May 2023**, at the venues as follows:

- Hard Copy: Standerton Public Library;
- Hard Copy: Sakhile Public Library;
- Hard Copy: Thuthukani Library;
- Hard Copy: Tutuka Power Station Security Office
- Electronic Copy: WSP Website (https://www.wsp.com/en-ZA/services/public-documents); and
- Electronic Copy: Datafree Website (https://wsp-engage.com/).

The Draft Reports were also made available to Commenting Authorities via a One Drive link. In order to ensure maximum participation of all I&APs, reports were shared on the Datafree website.

Proof of placement of the Draft Reports is provided in the SER.

2.4 SUMMARY OF IMPACT SIGNIFICANCE SCREENING

This section provided an overview of the likely significance of construction phase (**Table 2-2**), operational phase (**Table 2-3**) and decommissioning phase (**Table 2-4**) in the form of an impact screening tool which was based on two criteria, namely probability and consequence (outlined in Section 3.4). This tool was used to determine whether any additional assessment may be required in the EIA phase. Impacts were refined (where applicable) and assessed during the EIA phase.

Table 2-2 – Significance of potential construction phase impacts

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Soil, Landuse and Land Capability	Soil and land capability	Negative	4	3	High
	Soil Contamination	Negative	3	2	Medium
	Soil Compaction	Negative	3	2	Medium
	Soil Erosion	Negative	2	2	Low
Plant Species	Floral Habitat and Diversity	Negative	4	3	High
	Floral SCC	Negative	3	2	Medium
Animal Species	Faunal Habitat and Diversity	Negative	4	3	High
	Faunal SCC	Negative	3	3	Medium
Aquatic Biodiversity – CVB Wetland	Loss of wetland habitat and ecological structure	Negative	2	3	Medium
	Changes to sociocultural and service provision	Negative	2	2	Low
	Impacts on hydrology and sediment balance	Negative	2	3	Medium
	Impacts on water quality	Negative	2	3	Medium
Avifauna	Displacement of priority species due to disturbance	Negative	4	2	Medium
	Displacement of priority species due to habitat transformation	Negative	4	3	High
Bats	Habitat destruction	Negative	1	3	Low
Archaeology	Impacts of the proposed development to archaeological resources	Negative	1	4	Medium
Palaeontology	Impact to Fossil Resources	Negative	1	3	Low
Transport	Temporary increase in traffic, noise and dust pollution associated with potential traffic.	Negative	2	3	Medium
Visual	Visual impact to surrounding area	Negative	4	2	Medium

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Social	Creation of employment and business opportunities	Positive	2	3	Medium
	Presence of construction workers and potential impacts on family structures and social networks	Negative	2	2	Low
	Influx of job seekers	Negative	2	2	Low
	Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	Negative	3	2	Medium
	Increased risk of grass fires	Negative	3	2	Medium
	Impact of heavy vehicles and construction activities	Negative	3	2	Medium
	Loss of farmland	Negative	3	2	Medium
Geotechnical	Soil erosion	Negative	2	2	Low
	Disturbance of fauna and flora	Negative	3	2	Medium
	Oil spillages from heavy plant	Negative	2	2	Low
	Slope stability	Negative	1	1	Very Low
	Seismic activity	Negative	1	2	Very Low
Risk	Impact on Human Health chronic exposure to toxic chemical or biological agents	Negative	3	2	Medium
	Impact on human and equipment safety - exposure to explosion over pressures	Negative	3	2	Medium
	human and equipment safety – exposure to fire radiation	Negative	3	2	Medium
	Impact on human and equipment safety - exposure to acute toxic chemical and biological agents for SSL BESS	Negative	3	2	Medium

Table 2-3 – Significance of potential operational phase impacts

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Avifauna	Mortality of priority species due to collisions	Negative	3	1	Low
	Entrapment of large-bodied birds in the perimeter fence lines of Tournée SEF Facilities	Negative	3	2	Medium
	Mortality of priority species due to electrocution	Negative	3	2	Medium
	Mortality of priority species due to collisions with reticulation networks	Negative	3	2	Medium
Transport	Noise and dust pollution associated potential traffic.	Negative	1	3	Low
Visual	Visual impact to surrounding area	Negative	4	2	Medium
Social	Generate renewable energy	Positive	3	4	High
	Creation of employment and business opportunities	Positive	1	4	Medium
	Benefit associated with community trust	Positive	2	3	Medium
	Benefits for landowners	Positive	1	4	Medium
	Visual impact and impact on sense of place	Negative	1	3	Low
	Impact on property values	Negative	1	3	Low
	Impact on tourism	Negative	1	3	Low
Risk	Impact on Human Health chronic exposure to toxic chemical or biological agents	Negative	3	2	Medium
	Impact on human and equipment safety - exposure to explosion over pressures	Negative	3	2	Medium
	human and equipment safety – exposure to fire radiation	Negative	3	2	Medium
	Impact on human and equipment safety - exposure to acute toxic chemical and	Negative	3	2	Medium

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
	biological agents for SSL BESS				

Table 2-4 – Significance of potential decommissioning phase impacts

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)
Transport	Temporary increase in traffic, noise and dust pollution associated with potential traffic.	Negative	2	3	Medium
Visual	Visual impact to surrounding area	Negative	4	2	Medium
Social	Social impacts associated with decommissioning	Negative	2	2	Low
Geotechnical	Soil erosion	Negative	2	2	Low
	Disturbance of fauna and flora	Negative	3	2	Medium
	Potential oil spillage	Negative	2	2	Low
	Slope stability	Negative	1	1	Very Low
Risk	Impact on Human Health chronic exposure to toxic chemical or biological agents	Negative	3	2	Medium
	Impact on human and equipment safety - exposure to explosion over pressures	Negative	3	2	Medium
	human and equipment safety – exposure to fire radiation	Negative	3	2	Medium
	Impact on human and equipment safety - exposure to acute toxic chemical and biological agents for SSL BESS	Negative	3	2	Medium

3 EIA PROCESS

3.1 DFFE WEB-BASED ENVIRONMENTAL SCREENING TOOL

DFFE has developed the National Web-based Environmental Screening Tool in order to flag areas of potential environmental sensitivity related to a site as well as a development footprint and produces the screening report required in terms of regulation 16 (1)(v) of the EIA Regulations (2014, as amended). *The Notice of the requirement to submit a report generated by the national web-based environmental screening tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended (GN 960 of July 2019)* states that the submission of a report generated from the national web-based environmental screening tool, as contemplated in Regulation 16(1)(b)(v) of the EIA Regulations, 2014, published under Government Notice No. R982 in Government Gazette No. 38282 of 4 December 2014, as amended, is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the EIA Regulations, 2014 (as amended) as of 04 October 2019.

The Screening Report generated by the National Web-based Environmental Screening Tool contains a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development footprint as well as the most environmentally sensitive features on the footprint based on the footprint sensitivity screening results for the application classification that was selected.

A screening report for the proposed Tournée 2 Solar PV Facility was generated on 06 March 2023 and is attached as **Appendix F**. The Screening Report for the project identified various sensitivities for the site. The report also generated a list of specialist assessments that should form part of the S&EIA based on the development type and the environmental sensitivity of the site. Assessment Protocols in the report provide minimum information to be included in a specialist report to facilitate decision-making.

Table 3-1 below provides a summary of the sensitivities identified for the development footprint.

Table 3-1 – Sensitivities identified in the DFFE Screening Report

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme		X		
Animal Species Theme			X	
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Avian Theme				X
Civil Aviation (Solar PV) Theme			X	
Defence Theme				X

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Landscape (Solar) Theme	X			
Palaeontology Theme	X			
Plant Species Theme			X	
Radio Frequency Interference (RFI) Theme			X	
Terrestrial Biodiversity Theme	X			

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report as determined by the screening tool:

- Agricultural Impact Assessment;
- Landscape/Visual Impact Assessment;
- Archaeological and Cultural Heritage Impact Assessment ;
- Palaeontology Impact Assessment;
- Terrestrial Biodiversity Impact Assessment;
- Aquatic Biodiversity Impact Assessment;
- Civil Aviation Assessment;
- Defence Assessment;
- RFI Assessment;
- Geotechnical Assessment;
- Socio-Economic Assessment;
- Plant Species Assessment; and
- Animal Species Assessment.

3.1.1 MOTIVATION FOR SPECIALIST STUDIES

The report recognises that "it is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the footprint situation." The specialist studies required for the proposed Tournée 2 Solar PV Facility Solar PV Facility, as identified by the DFFE Screening Tool are included in **Table 3-2**. The table also identifies the specialist studies commissioned and provides motivation for specialist studies not commissioned.

Table 3-2 - Specialist Studies identified by the DFFE Screening Tool

Specialist Study Identified	Specialist Study Commissioned	Motivation
Agricultural Impact Assessment	Yes	N/A
Landscape/Visual Impact Assessment	Yes	N/A

Specialist Study Identified	Specialist Study Commissioned	Motivation
Archaeological and Cultural Heritage Impact Assessment	Yes	N/A
Palaeontology Impact Assessment	Yes	N/A
Terrestrial Biodiversity Impact Assessment	Yes	N/A
Aquatic Biodiversity Impact Assessment	Yes	N/A
Civil Aviation Assessment	No	A formal Civil Aviation Assessment will not be undertaken as part of the S&EIA Process. Nevertheless, the relevant Authorities have been included on the project stakeholder database. As of the 1st of February 2022, ATNS has been appointed as the new Obstacle application Service Provider for Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Solar assessments. A Solar Obstacles application have been submitted to ATNS for the project and the required permits will be obtained prior to the development of the project. The SACAA has been included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought. This theme has been identified as a medium sensitivity; however, a sensitivity verification has been undertaken by the EAP and the theme has been verified to be low. The sensitivity verification is included in **Section 8.1.10**
Defence Assessment	No	The Department of Defence has been included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought. As this theme has been identified as a low sensitivity, no compliance statement is required
RFI Assessment	No	An RFI Study will not be undertaken. The SAWS has confirmed that the proposed project will not have a direct impact on the SAWS radar system. Furthermore, EMI approvals will be sought. Telecommunications service providers will be consulted to obtain any relevant comments regarding the proposed projects. In addition, (South African Radio Astronomy Observatory) SARAO will be consulted regarding any specific requirements in terms of the SKA. This theme has been identified as a medium sensitivity; however, a sensitivity verification has been undertaken by the EAP and the theme has been verified to be low. The sensitivity verification is included in **Section 8.1.12**

Specialist Study Identified	Specialist Study Commissioned	Motivation
Geotechnical Assessment	No	A detailed Geotechnical Assessment will not be undertaken as this will be undertaken during the design phase. A Geotechnical Desktop Study has been undertaken and is included in **Appendix H.12.**
Socio-Economic Assessment	Yes	N/A
Plant Species Assessment	Yes	N/A
Animal Species Assessment	Yes	N/A

The Tournée 2 Solar PV Facility is required to fully comply with the requirements and expectations of the ESMS, from inception, development, construction, operation, and any decommissioning. As a result, additional specialist studies are required. The following specialist studies have been commissioned in addition to those in **Table 3-2**.

- Air Quality Compliance Statement;
- Noise Compliance Statement;
- Avifauna Assessment;
- Bats Scoping Survey;
- Traffic and Transport Assessment;
- Geotechnical Desktop Study; and
- High-level Safety, Health and Environmental Assessment.

The above specialist studies commissioned were presented to DFFE during the pre-application meeting that was held with on 27 February 2023. The specialist studies commissioned were accepted by the DFFE as per the meeting minutes included in the SER in **Appendix D**.

Specialist assessments were conducted in accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes, which were promulgated in Government Notice No. 320 of 20 March 2020 and in Government Notice No. 1150 of 30 October 2020 (i.e. “the Protocols”). The assessment protocols followed as well as the site sensitivity verification undertaken by the specialists are indicated in **Section 8**.

3.2 APPLICATION FOR ENVIRONMENTAL AUTHORISATION

The application phase consisted of a pre-application consultation with DFFE and subsequently completing the appropriate application form as well as the submission and registration of the application for EA with the DFFE. The pre-application meeting was held with DFFE on 27 February 2023 (meeting minutes included in the SER in **Appendix D**). The application form was submitted to the DFFE with the DSR on 24 March 2023. An updated application form was submitted with the FSR. The DFFE Reference Number is 14/12/16/3/3/2/2340.

3.3 BASELINE ENVIRONMENTAL ASSESSMENT

The description of the environmental attributes of the Project area was compiled through a combination of desktop reviews and site investigations. Desktop reviews made use of available information including existing reports, aerial imagery, and mapping. The specialist teams undertook site investigations, between January and February 2023, to identify sensitive features on site that informed the sensitivity mapping(see **Section 8.2**) for the Tournée 2 Solar PV Facility.

3.4 IMPACT ASSESSMENT METHODOLOGY

3.4.1 ASSESSMENT OF IMPACTS AND MITIGATION

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct[1], indirect[2], secondary[3] as well as cumulative[4] impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria[5] presented in **Table 3-3.**

Table 3-3 – Impact Assessment Criterion and Scoring System

Criteria	Score 1	Score 2	Score 3	Score 4	Score 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental	Reversible: Recovery		Recoverable: Recovery		Irreversible: Not possible

[1] Impacts that arise directly from activities that form an integral part of the Project.
[2] Impacts that arise indirectly from activities not explicitly forming part of the Project.
[3] Secondary or induced impacts caused by a change in the Project environment.
[4] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.
[5] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

Criteria	Score 1	Score 2	Score 3	Score 4	Score 5
receptor to rehabilitate or restore after the activity has caused environmental change	without rehabilitation		with rehabilitation		despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
Impact Significance Rating					
Total Score	**4 to 15**	**16 to 30**	**31 to 60**	**61 to 80**	**81 to 100**
Environmental Significance Rating (Negative (-))	**Very low**	**Low**	**Moderate**	**High**	**Very High**
Environmental Significance Rating (Positive (+))	**Very low**	**Low**	**Moderate**	**High**	**Very High**

3.4.2 IMPACT MITIGATION

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development’s actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in **Figure 3-1** below.

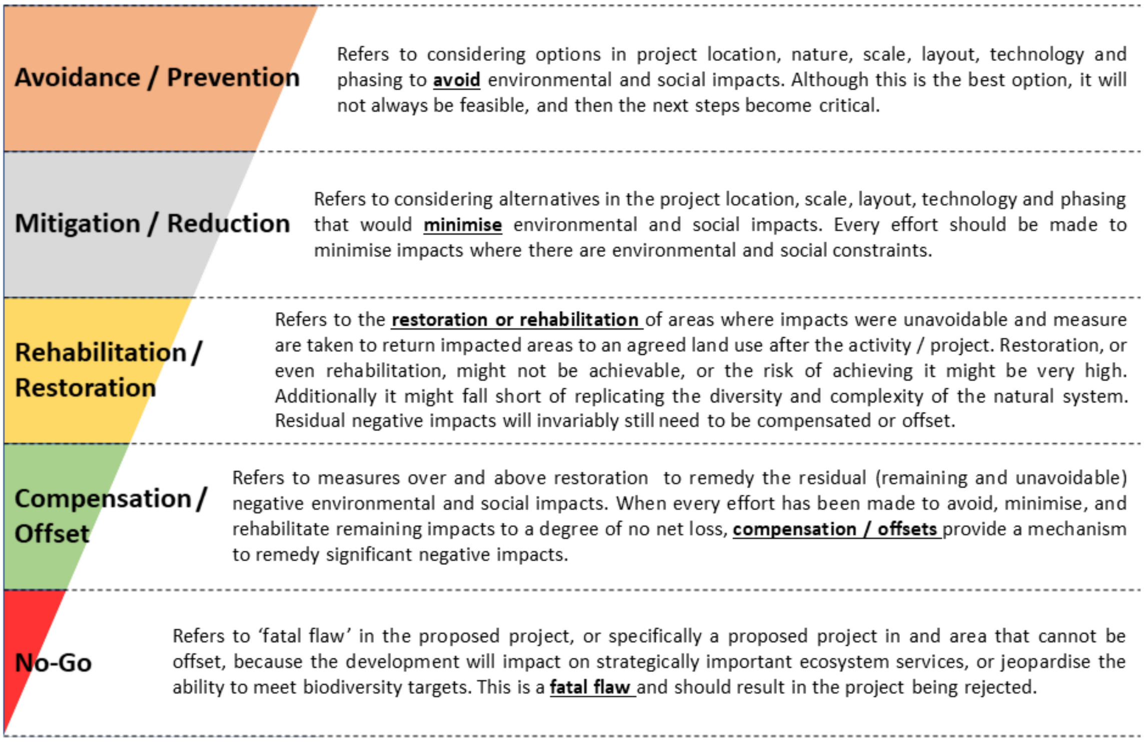


Figure 3-1 - Mitigation Sequence/Hierarchy

The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

3.5 STAKEHOLDER ENGAGEMENT PROCESS

Stakeholder engagement (public participation) is a requirement of the S&EIA process. It consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIA decision-making process. Effective engagement requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the proposed project. The objectives of the stakeholder engagement process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the proposed project;
- Clearly outline the scope of the proposed project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the proposed project, issues, and solutions.

A SER has been included in **Appendix D** detailing the project's compliance with Chapter 6 of the NEMA EIA Regulations 2014, as amended.

3.5.1 STAKEHOLDER IDENTIFICATION

Stakeholders were identified and will continue to be identified through several mechanisms. These include:

- Utilising existing databases from other projects in the area;
- Advertising in the press;
- Placement of community notices; and
- Completed comment sheets.

All Stakeholders identified to date have been registered on the project stakeholder database. The EAP endeavoured to ensure that individuals/organisations from referrals and networking were notified of the Proposed Project. Stakeholders were identified at the horizontal (geographical) and vertical extent (organisations level).

A list of stakeholders captured in the project database is included in the SER in **Appendix D**.

3.6 ASSUMPTIONS AND LIMITATIONS

General assumptions and limitations:

- The EAP hereby confirms that they have undertaken to obtain project information from the client that is deemed to be accurate and representative of the project;
- Site visits have been undertaken to better understand the project and ensure that the information provided by the client is correct, based on site conditions observed;
- The EAP hereby confirms their independence and understands the responsibility they hold in ensuring all comments received are accurately replicated and responded to within the EIA documentation;
- The comments received in response to the public participation process, will be representative of comments from the broader community; and
- Based on the Pre-Application meeting and subsequent minutes, the CA would not require additional specialist input, to make a decision regarding the application.

Soil, Land use and Land Capability:

- It is important to note that although all data sources used provide useful and often verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the actual site characteristics associated with the investigation area at the scale required to inform an environmental process. However, this information is useful as background information to the study and, if desktop results are considered with the outcome of the soil and land capability assessment, sufficient decision making can take place;
- The soil survey conducted as part of the land capability assessment was confined within the study area outline. However, consideration of the immediately adjacent areas was given; and
- Since soils occur in a continuum with infinite variances, it is often problematic to classify any given soils as one form, or another. for this reason, the classifications presented in this report are based on the "best fit" to the soil classification system of South Africa.

Air Quality:

- The identification of sensitive receptors is based on a desktop assessment using satellite imagery and it is assumed that all key receptors have been considered.

Noise:

- The identification of sensitive receptors is based on a desktop assessment using satellite imagery and it is assumed that all key receptors have been considered.

Terrestrial Biodiversity:

- The biodiversity desktop assessment was confined to the Tournée 2 Solar PV Facility and did not include the neighbouring and adjacent properties, although the sensitivity of surrounding areas is included on the respective maps.
- The “screening tool” provides names of Sensitive Species likely to be present within Tournée 2 Solar PV Facility and its surrounds. Within the Screening Tool outcome, the names of some species are not provided. These species are rather assigned a number keeping them unidentifiable (e.g., Sensitive Species 1). This procedure is followed because of the vulnerability of the species to threats such as illegal harvesting and overexploitation. According to the best practice guidelines provided by the SANBI, the identity of Sensitive Species may not appear in the final EIA report nor any of the specialist reports released into the public domain. However, the conservation threat status of such species has been provided.
- It is important to note that although all data sources used provide useful and often verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the assessed area’s actual site characteristics at the scale required to inform more intricate planning, e.g., at the scale needed for an EA. Nevertheless, this information is useful as background information to the study and is important in legislative contextualisation of risk and impact and was used as a guideline to inform the biodiversity assessment (refer also to Parts B-Floral Assessment and Part C- Faunal Assessment), and to focus on areas and aspects of increased conservation importance. It must, however, be noted that site assessment of key areas may potentially contradict the information contained in the relevant databases, in which case the site verified, ground-truthed information must carry more weight in the decision-making process.

Floral:

- The floral assessment is confined to the proposed Tournée 2 Solar PV Facility and does not include the neighbouring and adjacent properties. The immediate surroundings were, however, included in the desktop analysis of which the results are presented in the Terrestrial Biodiversity report: Section 3 (**Appendix H.5**).
- Sampling by its nature means that not all individuals are assessed and identified. With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. A field assessment was undertaken from the 6th to 9th February 2023 (summer). According to the Species Environmental Assessment Guidelines (SANBI, 2020) summer assessments (December to February) are ideal for Grassland Biomes (i.e., Soweto Highveld Grasslands). The Mpumalanga Tourism and Parks Agency (MTPA) provides minimum requirements for the environmental studies where floristic (plant) surveys are suggested to be conducted during the growing season of all species that may potentially occur with two (2) visits undertaken (November & February, in particularly sensitive habitat). However, on-site data was also augmented with all available desktop data, together with project experience in the area to improve on the overall understanding of the assessment area's floral ecology.
- Additional floral assessments could be conducted, e.g., in November, to potentially account for different species flowering times; however, the findings of this assessment are considered an accurate reflection of the floral ecological characteristics associated with Tournée 2 Solar PV Facility for the purposes of an informed decision-making processes.
- The Department of Forestry, Fisheries, and the Environment's "Screening Tool" provides names of Sensitive Species likely to be present within Tournée 2 Solar PV Park and its surrounds. Within the Screening Tool outcome, the names of some species are not provided. These species are rather assigned a number keeping them unidentifiable (e.g., Sensitive Species 1). This procedure is followed because of the vulnerability of the species to threats such as illegal harvesting and overexploitation. According to the best practice guidelines provided by the South African National Biodiversity Institute (SANBI), the identity of Sensitive Species may not appear in the final Environmental Impact Assessment (EIA) report nor any of the specialist reports released into the public domain. However, the conservation threat status of such species has been provided.
- The Decommissioning process and intended end-goal (of the rehabilitation) was not provided at the time of assessment. As such, it will be recommended that the post-closure landscape should attempt to reinstate, as far as is feasible, a wilderness landscape resembling the surrounding areas and comprising native vegetation from the reference states. The impact assessment will be undertaken with this assumption and when a post-closure goal is established and, if it differs from what is recommended in this report, the impact assessment will have to be updated accordingly.

Faunal:

- The faunal assessment is confined to the Tournée 2 Solar PV Facility and does not include the neighbouring and adjacent properties. The entire Tournée 2 Solar PV Facility and immediate surroundings were, however, included in the desktop analysis of which the results are presented in Terrestrial Biodiversity report: Section 3 (**Appendix H.5**).
- With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. It is, however, expected that most faunal communities have been accurately assessed and as such the information provided herein is considered sufficient to allow informed decision making to take place and facilitate integrated environmental management;

- Due to the nature and habits of many faunal taxa and the surrounding anthropogenic activities, it is unlikely that all species or classes would have been observed during a field assessment of limited duration;
- Sampling by its nature, means that not all individuals are assessed and identified. Some species and taxa within the footprint area may therefore have been missed during the assessment;
- The data presented in this report are based on a site assessment undertaken in October 2022 (early summer). On-site data was further augmented with all available desktop data. The findings of the field assessment is considered an adequate reflection of the faunal ecological characteristics of the Tournée 2 Solar PV Park for the purposes of informed decision-making processes; and
- A more comprehensive assessment would require that assessments take place in all seasons of the year. However, on-site data was significantly augmented with all available desktop data and specialist experience in the area.

Freshwater:

- The freshwater ecosystems associated with the proposed Tournée 2 Solar PV Facility, were ground-truthed, however freshwater ecosystems within 500 m of the proposed Tournée 2 Solar PV Facility (within the investigation area) were delineated in fulfilment of GN509 of the NWA using various desktop methods including use of topographic maps, historical and current digital satellite imagery and aerial photographs. Delineations developed using desk based methods were ground-truthed where feasible. The delineations of freshwater ecosystems outside the proposed Tournée 2 Solar PV Facility must not be utilised for any purpose, other than planning within the proposed Tournée 2 Solar PV Facility the data in this study pertains to. Any areas that may have additionally been mapped will require field-based delineation and ground-truthing as directed by applicable legislation and best practice methods;
- Various areas within the proposed Tournée 2 Solar PV Facility and investigation area displayed transformed topography, soil profiles and runoff patterns within the landscape. As such, these disturbances have likely resulted in alterations to the hydroperiod of the identified freshwater ecosystems;
- The proposed Tournée 2 Solar PV Facility is located within the Ea17 land type, which is characterised by the predominance of vertic soils. Due to their chemical properties, vertic soils do not display typical signs of redoximorphism in the form of iron and manganese mottling, and thus delineation of wetland habitats needs to be based on assessment of topographical and vegetative indicators as the primary indicators;
- It is important to note that although all data sources used provide useful and often verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the actual site characteristics within the proposed Tournée 2 Solar PV Facility at the scale required to inform the EA process. However, this information is considered useful as background information to the study;
- Global Positioning System (GPS) technology is inherently inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur. If more accurate assessments are required, the freshwater ecosystems will need to be surveyed and pegged according to surveying principles and with surveying equipment;
- Wetland, riparian and terrestrial zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative species. Within this transition

zone, some variation of opinion on the freshwater ecosystem boundaries may occur. However, if the DWAF (2008) method is followed, all assessors should get largely similar results; and

- With ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. It is, however, expected that the freshwater ecosystems that may be affected by the proposed activities have been accurately assessed and considered, based on the site observations undertaken in terms of freshwater ecosystem ecology.

Avifauna:

- Transects are only conducted during daylight hours. Therefore, any bird movement occurring at night was recorded under ad hoc conditions. Some waterbirds and migrants are known to make regular movements at night.
- Although very useful, the SABAP1 bird data set is more than two decades old. This dataset does however provide an adequate baseline to use when assessing species presence, distribution, and abundance. The use of SABAP2 along with SABAP1 will provide substantial data to be used during initial desktop assessments. This data was, however, mostly obtained by citizen scientists, and accuracy depends on their identification skills.
- Placement and dimensions of solar equipment has not yet been finalized and provided.
- Final layout of the proposed SEF has not yet been provided.

Bats:

- Bats are known to migrate, and their population sizes varies seasonally. As such, this Scoping Survey only gives a brief snapshot into bat populations in the area and no conclusions can be drawn from the presence or absence of species. Even though studies have reported on bats migration, the exact routes followed are not known (Pretorius et al., 2020).
- The same is true for breeding behaviour and the formation of maternity colonies for many species. Distribution records of bats in southern Africa are still poorly reported and limited for many species.
- In addition, migratory patterns of bats are largely unknown in South Africa. Studies have reported that bats do migrate, but the exact routes followed are not known (Pretorius et al., 2020). The same is true for breeding behaviour and the formation of maternity colonies for many species.
- SEF pre-construction monitoring reports on bats are reliant on reporting echolocation calls and identifying species from these calls, but without echolocation call libraries accurate identification is not always possible. Published libraries created from release and handheld calls of captured bats are available for southern Africa but are geographically limited. Since the echolocation calls of a particular species from different regions in South Africa are known to vary to some degree (Monadjem et al., 2020), call libraries created in different regions are not always comparable.
- Bat detectors are not always effective in recording echolocation calls for all bat species, and some species may be missed e.g., some fruit bat species that do not echolocate. Other species, such as the Egyptian slit-faced bat (*Nycteris thebaica*), emits low intensity calls that may not be recorded.
- Bat detectors are also limited in the range over which a call can be recorded, and this can be further influenced by environmental conditions such as humidity. In addition, the microphones that are coupled to the detectors are not omnidirectional and recording quality and number of recordings is influenced by the orientation of the call relative to the microphone.

Heritage:

- The significance of the sites and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.
- It should be noted that archaeological and palaeontological deposits often occur below ground level.
- Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted, and it would be required that the heritage consultants are notified for an investigation and evaluation of the find(s) to take place.
- The local farmers confirmed a rainfall of 70 mm between the 31st of January and the morning of the 1st of February. The rain affected the surface of the development footprint properties and access roads. In addition, the soil was saturated, with waterlogged areas, specifically near the water sources and cultivated areas. The water and mud affected the surface's visibility and made certain areas inaccessible by vehicle and foot.
- Several areas were densely vegetated, with various grasses and vegetation affecting the visibility of the surface. Vegetation growth, wet weather, waterlogged areas, and erosion limited the transects that could be undertaken during the survey. Nevertheless, the survey tracks followed the landscape, farm roads, fences and boundaries from which we conducted pedestrian surveys at various points. In addition, the ground surface and areas with noticeable vegetation changes were inspected to the best of the specialists' abilities.

Palaeontological:

- Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and only some do contain fossil plant, insect, invertebrate and vertebrate material.
- The site visit and walk through on 06 February 2023 (summer) by palaeontologists confirmed that there are no fossils on the surface. There were no outcrops of shales that could potentially preserve fossils. There were no fossils on the surface. It is not known what lies below the surface but the soils appear to be a metre or more deep. The overlying soils and sands of the Quaternary period would not preserve fossils.

Archaeological:

- The local farmers confirmed a rainfall of 70 mm between the 31st of January and the morning of the 1st of February. The rain affected the surface of the development footprint properties and access roads. In addition, the soil was saturated, with waterlogged areas, specifically near the water sources and cultivated areas. The water and mud affected the surface's visibility and made certain areas inaccessible by vehicle and foot.
- Several areas were densely vegetated, with various grasses and vegetation affecting the visibility of the surface. Vegetation growth, wet weather, waterlogged areas, and erosion limited the transects that could be undertaken during the survey. Nevertheless, the survey tracks followed the landscape, farm roads, fences and boundaries from which we conducted pedestrian surveys at various points. In addition, the ground surface and areas with noticeable vegetation changes were inspected to the best of our abilities.

Transport:

- This study is based on the project information provided by the client as available at commencement of the Scoping Phase.
- According to the Eskom Specifications for Power Transformers (Eskom Power Series, Volume 5: Theory, Design, Maintenance and Life Management of Power Transformers), the following dimensional limitations need to be kept when transporting the transformer – total maximum height 5 000 mm, total maximum width 4 300 mm and total maximum length 10 500 mm. It is envisaged that for this project the inverter, transformer, and switchgear will be transported to site in containers on a low bed truck and trailer. The transport of a mobile crane and the transformer are the only abnormal loads envisaged. The crane will be utilised for offloading equipment, such as the transformer.
- Maximum vertical height clearances along the haulage route are 5.2 m for abnormal loads.
- If any elements are manufactured within South Africa, these will be transported from their respective manufacturing centres, which would be either in the greater Cape Town area, Johannesburg, or possibly in Pinetown/Durban.
- All haulage trips will occur on either surfaced national and provincial roads or existing gravel roads.
- Material for the construction of internal access roads will be sourced locally as far as possible.
- The final access points are to be determined during the detailed design stage. Only recommended access points at conceptual level can be given at this stage.
- An 18-months construction period is assumed with some of the construction period dedicated to site prep and civil works.

Visual:

- No specific national legal requirements for VIAs currently exist in South Africa. However, the assessment of visual impacts is required by implication when the provisions of relevant acts governing environmental management are considered and when certain characteristics of either the receiving environment or the proposed project indicate that visibility and aesthetics are likely to be significant issues and that visual input is required (Oberholzer, 2005);
- Distance and terrain play a critical role when assessing the visual impacts of an area. Due to the undulating terrain of the area and relatively low height of the proposed PV structures and associated infrastructure, it was deemed necessary to identify all potential sensitive receptors within a 5 km radius, on a desktop-level, which would then be verified during the field assessment. The 5 km radius can be considered the "visual assessment zone". It should be noted that the visibility of an object decreases exponentially the further away the observer is from the source of impact;
- Due to a lack of guidelines for specialist visual impact assessments as part of the EIA process within the Mpumalanga Province, the "Guidelines for Involving Visual and Aesthetic Specialists in the EIA Process" (Oberholzer, 2005), prepared for the Western Cape Department of Environmental Affairs & Development Planning, was used; and
- Abstract or qualitative aspects of the environment and the intangible value of elements of visual and aesthetic significance are difficult to measure or quantify and as such depend to some degree on subjective judgements. It, therefore, is necessary to differentiate between aspects that involve a degree of subjective opinion and those that are more objective and quantifiable, as outlined in the diagram below (The Landscape Institute and Institute of Environmental Management and Assessment (LI IEMA, 2002).

Desktop Geotechnical:

- The statements presented in the document are intended to advise you of what your realistic expectations of this report should be, and to present you with recommendations on how to minimize the risks associated with the groundworks for this project. The document is not intended to reduce the level of responsibility accepted by WSP, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.
- The Document has been prepared for the particular purpose outlined in WSP's proposal and no responsibility is accepted for the use of the Document, in whole or in part, in other contexts or for any other purpose.
- The scope and the period of WSP's Services are as described in WSP's proposal and are subject to restrictions and limitations. WSP did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in the Document. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by WSP in regard to it.
- Conditions may exist which were undetectable given the limited nature of the enquiry WSP was retained to undertake with respect to the site. Variations in conditions may occur between investigatory locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the Document. Accordingly, additional studies and actions may be required.
- In addition, it is recognised that the passage of time affects the information and assessment provided in the Document. WSP's opinions are based upon information that existed at the time of the production of the Document. It is understood that the Services provided allowed WSP to form no more than an opinion of the actual conditions of the site at the time the site was visited and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.
- Any assessments made in the Document are based on the conditions indicated from published sources and the investigation described. No warranty is included, either express or implied, that the actual conditions will conform exactly to the assessments contained in the Document.
- Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by WSP for incomplete or inaccurate data supplied by others.
- The Client acknowledges that WSP may have retained sub-consultants affiliated with WSP to provide Services for the benefit of WSP. WSP will be fully responsible to the Client for the Services and work done by all its sub-consultants and subcontractors. The Client agrees that it will only assert claims against and seek to recover losses, damages or other liabilities from WSP and not WSP's affiliated companies. To the maximum extent allowed by law, the Client acknowledges and agrees it will not have any legal recourse, and waives any expense, loss, claim, demand, or cause of action, against WSP's affiliated companies, and their employees, officers and directors.
- The Document is provided for sole use by the Client and is confidential to it and its professional advisers. No responsibility whatsoever for the contents of the Document will be accepted to any person other than the Client. Any use which a third party makes of the Document, or any reliance on or decisions to be made based on it, is the responsibility of such third parties. WSP accepts

no responsibility for damages, if any, suffered by any third party because of decisions made or actions based on the Document.

Social:

- Technical suitability:
  - It is assumed that the development site represents a technically suitable site for the establishment of the proposed SEF and associated infrastructure.
- Strategic importance of the project:
  - The strategic importance of promoting renewable and other forms of energy is supported by the national and provincial energy policies.
- Fit with planning and policy requirements:
  - Legislation and policies reflect societal norms and values. The legislative and policy context therefore plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard, a key component of the SIA process is to assess the proposed development in terms of its fit with key planning and policy documents. As such, if the findings of the study indicate that the proposed development in its current format does not conform to the spatial principles and guidelines contained in the relevant legislation and planning documents, and there are no significant or unique opportunities created by the development, the development cannot be supported.
- Demographic data:
  - Some of the provincial documents do not contain data from the 2016 Household Community Survey. However, where required the relevant 2016 data has been provided.

Risk:

- The study proceeded based on the assumption that lithium solid state batteries would be used and that these would be installed in containers.

4 PROJECT DESCRIPTION

This section provides a description of the location of the project area and the site location alternatives considered for the project. The descriptions encompass the activities to be undertaken during the construction and operational phases as well as the consideration for site accessibility, water demand, supply, storage, and site waste management. This section also considers the need and desirability of the project in accordance with Appendix 1 of GNR 326.

4.1 LOCATION OF THE PROPOSED PROJECT

The proposed Tournée 2 Solar PV Facility is located near Standerton, within the LLM and GSDM, in the Mpumalanga Province (**Figure 1-1**).

The details of the property associated with the proposed Tournée 2 Solar PV Facility, including the 21-digit Surveyor General (SG) codes for the cadastral land parcels are outlined in **Table 4-1**. The co-ordinates of the cadastral land parcels are included in **Table 4-2.**

Table 4-1 – Tournée 2 Solar PV Facility Affected Farm Portions

Farm Name	21 Digit Surveyor General Code of Each Cadastral Land Parcel
Remaining Portion of Portion 3 of Farm Dwars-in-die-Weg 350 IS	T0IS00000000035000003
Portion 6 of Farm Dwars-in-die-Weg 350 IS	T0IS00000000035000006

Table 4-2 – Coordinate Points of the Cadastral Land Parcel

Point	Longitude	Latitude
E	29° 26' 14.245" E	29° 26' 14.245" E
F	29° 25' 25.141" E	29° 25' 25.141" E
G	29° 25' 18.344" E	29° 25' 18.344" E
J	29° 24' 7.671" E	29° 24' 7.671" E
K	29° 24' 7.265" E	29° 24' 7.265" E
L	29° 25' 35.242" E	29° 25' 35.242" E
M	29° 25' 23.692" E	29° 25' 23.692" E
N	29° 25' 23.782" E	29° 25' 23.782" E

4.2 SOLAR PV GENERATION PROCESS

South Africa experiences some of the highest levels of solar radiation in the world between 4.5 and 6.5kWh/m^2/day) and therefore, possesses considerable solar resource potential for solar power generation.

In terms of large-scale grid connected applications the most commonly used technology utilised in South Africa is PV installations and is described in some detail in the following section.

It must be noted that this project is specific to solar power generation through the use of solar PV technology only.

4.2.1 PV AND MOUNTING SYSTEM

Internationally, solar PV is the fastest-growing power generation technology. Approximately 139 GW was added to the installed capacity globally in 2020, increasing the installed capacity by 18% from the previous year. The total capacity from PVs was 760 GW globally, producing approximately 3% of the world's electricity. In South Africa the solar PV installed capacity in 2020 grew by 37% compared to the previous year's value. As much as 3.6 GW of PV is planned to be installed by 2026, with approximately 1.48 GW already installed as recorded in 2019.

Large-scale or utility-scale PV systems are designed for the supply of commercial power into the electricity grid. Large-scale PV plants differ from the smaller units and other decentralised solar power applications because they supply power at the utility level, rather than to local users.

PV cells are made from semi-conductor materials that are able to release electrons when exposed to solar radiation. This is called the photo-electric effect. Several PV cells are grouped together through conductors to make up one module. Modules can be connected together to produce power in large quantities. In PV technology, the power conversion source is via PV modules that convert light directly to electricity.

Solar panels produce direct current (DC) electricity; therefore, PV systems require conversion equipment to convert this power to alternating current (AC), that can be fed into the electricity grid. This conversion is done by inverters. **Figure 4-1** provides an illustration of the main components of a solar PV power plant.

The solar PV panels can be mounted in various ways to ensure the maximum exposure to sunlight. The two main mounting systems that form part of a PV facility are either single axis tracking or fixed axis mounting structures. In the fixed axis mounting structures, the panels are installed and set to face north and does not move to follow the sun. With tracking systems, the panels track the sun and thereby ensure maximum exposure to the sunlight. Both mounting systems are considered for this project.

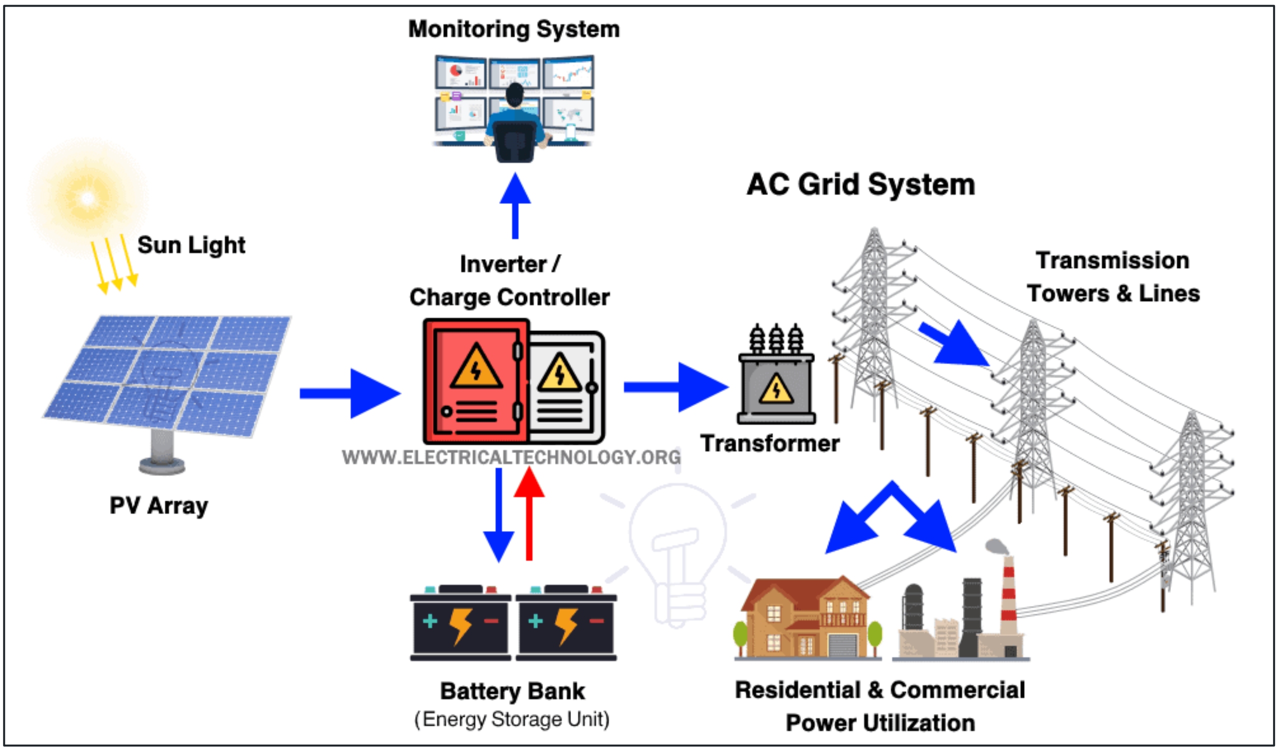


Figure 4-1 - Main components of a Solar PV Plant

Source: *www.electricaltechnology.org/2021/07/solar-power-plant.html*

4.3 BESS TECHNOLOGY

The Tournée 2 Solar PV Facility includes the development of a Battery Energy Storage System (BESS). There is a growing need for renewable energy technologies, such as solar and wind, to be able to supply a reliable source of electricity to the grid. Since solar and wind technology depend on whether the sun is shining or the wind is blowing, respectively, these technologies are only efficient when these sources are available. Battery storage systems allow for fluctuating renewable energy sources to be as stable as conventional systems and also provide a means to decouple generation of electricity from its use (i.e. provide electricity to the grid during peak demand) and therefore minimising supply and demand related issues.

Given the ongoing improvement in battery storage technology and the significant advantages of combining battery storage with wind farms, it makes sense to include a battery facility with the solar facility.

4.3.1 BATTERY TYPE

It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, or Lithium Nickel Manganese Cobalt oxides will be considered as the preferred battery technology. This is due to them being a mature and safe technology with regard to potential impacts on the environment in a solar facility, modular and easy to install and due to their technical characteristics, will work well as energy storage systems for solar facilities, as well as supporting grid stability. Lithium Battery Technologies arrive on site pre-assembled.

BESS consist of two main parts: battery modules and the accompanying Battery Management System (BMS), and a Power Conditioning System (PCS) used to enable the interface of the batteries to the grid. Individual battery cells are connected in a series/parallel arrangement in order to obtain the desired nominal voltage for highest efficiency and required storage capacity. The PCS is a bidirectional power conversion device (inverter), enabling AC power from the grid to be converted to DC to charge the batteries in a controlled manner, and discharge DC battery power to feed AC power onto the grid (**Figure 4-2**).

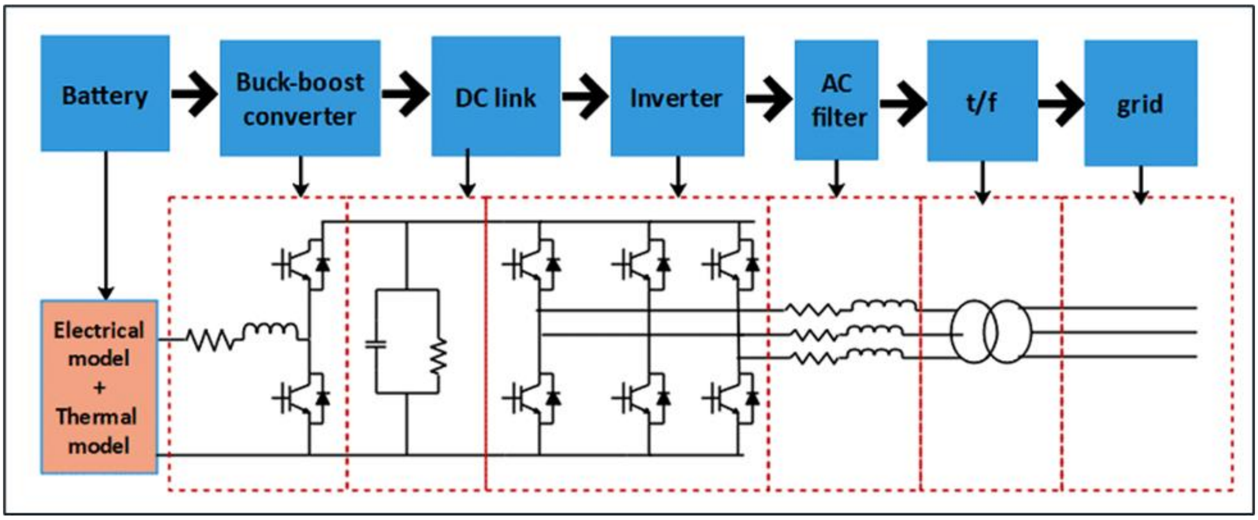


Figure 4-2 – BESS components Schematic

Source: www.researchgate.net

4.3.2 COMPLIANCE WITH LOCAL AND INTERNATIONAL STANDARDS

The cells, modules, racks and the complete facility will be compliant with all local laws and regulations and health and safety requirements governing such battery facilities. Over and above that they will comply with international standards such as UN 38.3 (Transportation Testing for Lithium Batteries), UL 1642 (Standard for Safety – Lithium-ion Batteries) and IEC 62619 (Secondary cells and batteries containing alkaline or other non-acid electrolytes Safety requirements for secondary lithium cells and batteries, for use in industrial applications). Furthermore, the battery facility will also comply with standards such as UL 1973 (Batteries for Use in Stationary Applications) and IEC 62619-2017 including thermal runaway non-propagation and safety zone region operation limits and a failure mode analysis. The design will be compliant with UL 9540 (Energy Storage Systems and Equipment): this standard defines the safety requirements for battery installation in industrial and grid connected applications.

4.4 PROJECT INFRASTRUCTURE

The proposed Tournée 2 Solar PV Facility will be developed with a contracted capacity of 150 MW, thus allowing for up to 150 MW for export from the facility. The proposed development footprint (buildable area) is approximately 297 hectares (ha) (subject to finalisation based on technical and environmental requirements), and the extent of the project area is approximately 573.78 ha. The development footprint includes the Solar PV field and all associated infrastructures as indicated below.

The proposed Tournée 2 Solar PV Facility will comprise the following key components:

- Solar Field;
- Back-to-Back Substation and BESS;
- Operations and Maintenance (O&M) Building Infrastructure;
- Construction Camp Laydown;
- Access Road; and
- Associated Infrastructure.

These items are discussed in more detail below.

4.4.1 SOLAR FIELD

- PV Modules, which convert the solar radiation into DC.
- PV panels will have a maximum height of 6 m, and could be mounted on fixed tilt, single axis tracking or dual axis tracking mounting structures of monofacial or bifacial Solar PV Modules.

4.4.2 SITE SUBSTATION AND BESS

- Total footprint will be up 7 ha in extent (4 ha for the BESS and 3 ha for the IPP portion of the substation).
- The substation will consist of a high voltage substation yard to allow for multiple (up to) 132 kV feeder bays and transformers, control building, telecommunication infrastructure, access roads, etc.
- The associated BESS storage capacity will be up to 150MW/600MW with up to four hours of storage. Area required: 40,000 m²
- It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, or Lithium Nickel Manganese Cobalt oxides will be considered as the preferred battery technology. The main components of the BESS include the batteries, power conversion system and transformer which will all be stored in various rows of containers.

4.4.3 OPERATION AND MAINTENANCE BUILDING INFRASTRUCTURE

- O&M building infrastructure will be required to support the functioning of the Solar PV Facility and for services required by operations and maintenance staff. The O&M building infrastructure will include:
  - Operations building (including workshop and stores) of approximately 1 500 m^2; and
  - Refuse area for temporary waste storage and conservancy tanks to service ablution facilities.

4.4.4 CONSTRUCTION CAMP LAYDOWN

Building infrastructure of up to a maximum height of 8m will be located within the project area. The infrastructure includes:

- Temporary infrastructure includes:
  - Typical construction camp area 100m x 50m = 5,000 m^2
  - Typical laydown area 100m x 200m = 20,000 m^2
  - Temporary cement batching plant - Gravel and sand will be stored in separate heaps whilst the cement will be contained in a silo. = 30,000 m²
  - Sewage: Septic tanks and portable toilets

4.4.5 ACCESS ROAD

- Access to the proposed Tournée 2 Solar PV Facility from the R39 or R38 towards the site;
- Access Road: Up to 8 m width;
- Internal roads: Up to 4 m in width; and
- Internal road length: Up to 20 km.

4.4.6 ASSOCIATED INFRASTRUCTURE

- The medium voltage collector system will comprise of cables up to and including 33kV that run underground, except where a technical assessment suggest that overhead lines are required, within the facility connecting the panels to the onsite substation;
- An up to 132 kV interconnecting Overhead Powerline to facilitate the connection between Tournee 1 and Tournee 2.
- Fencing of up to 4m high around the construction camp, O&M building and Site substation and BESS areas, including any other associated infrastructure (fencing and lighting, lightning protection, telecommunication infrastructure, storm water channels, water pipelines, offices, operational control centre, operation and maintenance area / warehouse / workshop, ablution facilities, a gate house, offices, security building, a visitor's centre; and substation building).
- 2 500 m² Paved areas

4.5 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

4.5.1 CONSTRUCTION PHASE

The construction process will follow industry standard methods and techniques. Key activities associated with the construction phase are described in **Table 4-3**.

Table 4-3 – Construction activities

Activity	Description
Establishment of access and internal roads	Access to the proposed Tournée 2 Solar PV Facility will be via the R39 or R38. Internal gravel roads will be developed. The roads will be up to 4 m wide, with a length of approximately up to 20 km.
Site preparation and establishment	Site establishment will include clearing of vegetation and any bulk earthworks that may be required.
Transport of components and equipment to site	All construction material (i.e., PV support structure materials), machinery and equipment (i.e., graders, excavators, trucks, cement mixers etc.) will be transported to site utilising the national, regional and local road network. Large components (such as substation transformers) may be defined as abnormal loads in terms of the Road Traffic Act (No. 29 of 1989). In such cases a permit may be required for the transportation of these loads on public roads.
Establishment of a laydown area on site	Construction materials, machinery and equipment will be kept at relevant laydown and/or storage areas. Laydown areas (site camps) of approximately up to 5 000m² each have been proposed for this project. The laydown areas will also be utilised for the assembly of the PV panels. The laydown area will limit potential environmental impacts associated with the construction phase by limiting the extent of the activities to one designated area.

Activity	Description
Erection of PV Panels	The PV panels will be arranged in arrays. The frames will be fixed onto vertical posts that will be driven into the ground utilising the relevant foundation method identified during the geotechnical studies, including potentially employing concrete foundations for the panel frames. PV panels will have a maximum height of 6 m.
Construction of substation and inverters	The facility output voltage will be stepped up from medium voltage to high voltage in the transformer. The medium voltage cables will be run underground within the facility to a common point before being fed to the onsite substation.
Establishment of ancillary infrastructure	Ancillary infrastructure will include a workshop, storage areas, office, and a temporary laydown area for contractor's equipment.
Rehabilitation	Once all construction is completed on site and all equipment and machinery has been removed from the site, the site will be rehabilitated.

4.5.2 OPERATIONAL PHASE

The proposed Tournée 2 Solar PV Facility is anticipated to have a minimum operational lifespan of 20 years. The facility will operate 7 days a week. While the project is self-sufficient, maintenance and monitoring activities will be required. Potable water requirements for permanent staff will be limited. During the operational phase there will be little to no Project-related movement along the servitudes as activities are limited to maintaining the servitude (including maintenance of access roads and cutting back or pruning of vegetation to ensure that vegetation does not affect the SEF), inspection of the SEF infrastructure and repairs when required. Limited impact is expected during operation since there will not be any intrusive work done outside of maintenance in the event that major damage occurs to site infrastructure. Operation of the SEF will involve the following activities:

- Servitude and access road maintenance is aimed at eliminating hazards and facilitating continued access to the SEF. The objective is to prevent all forms of potential interruption of power supply due to overly tall vegetation/climbing plants or establishment of illegal structures within the right servitude. It is also to facilitate ease of access for maintenance activities on the SEF. During the operational phase of the project, the servitude will be maintained to ensure that the functions optimally and does not compromise the safety of persons within the vicinity of the SEF.
- Tournée 2 Solar will develop comprehensive planned and emergency programmes through its technical operations during the operation and maintenance phase for the SEF. The maintenance activities will include:
  - Periodic physical examination of the SEF and its safety, security and integrity.
  - Defects that are identified will be reported for repair. Such defects may include defective conductors, flashed over insulators, defective dampers, vandalised components, amongst others.
  - Maintenance / repairs will then be undertaken.

4.5.3 DECOMMISSIONING PHASE

Following the initial 20-year operational period of the solar facility, the continued economic viability will be investigated. If the facility is still deemed viable, the life of the facility will be extended. The facility will only be decommissioned once it is no longer economically viable. If a decision is made to completely decommission the facility, this will be subject to a separate authorisation and impact assessment process, all the components will be disassembled, reused and recycled or disposed.

The decommissioning phase will include activities similar to that of the construction phase as indicated in **Table 4-3**.

The site would be returned to its current use i.e., agriculture.

4.6 NEED AND DESIRABILITY OF THE PROJECT

South Africa is faced with significant increases in electricity demand and a shortage in electricity supply. South Africa is the seventh highest coal producer in the world, with approximately 77% of the country's electricity generated from coal. This large dependence on coal and its use has also resulted in a variety of negative impacts on the environment, including the contribution to climate change. South Africa is also the highest emitter of greenhouse gases in Africa; attributed to the country's energy-intensive economy that largely relies on coal-based electricity generation.

Renewable energy development is regarded as an important contribution to meeting international and national targets of reducing reliance on fossil fuels, such as coal, which contribute towards greenhouse gas emissions and resultant climate change. The need and desirability of proposed Tournée 2 Solar PV Facility has been considered from an international, national, and regional perspective.

4.6.1 INTERNATIONAL PERSPECTIVE

The proposed project will align with internationally recognised and adopted agreements, protocols, and conventions. This includes the Kyoto Protocol (1997) which calls for countries internationally to reduce their greenhouse gas emissions through cutting down on their reliance on fossil fuels and investing in renewable energy technologies for electricity generation. The proposed project will therefore add capacity to the energy sector and generate electricity without greenhouse gas emissions and meet international requirements in this regard.

South Africa is also signatory to the United Nations' Development Programmes' (UNDP) Sustainable Development Goals (SDGs), particularly SGD 7 relating to affordable and clean energy. The proposed project qualifies as a clean technology that will generate up to 150MW of affordable energy to contribute to South Africa's energy mix.

The project will also greatly contribute to the countries' efforts to reduce their carbon emissions and play their role as part of the Paris Climate Accord. The Paris Agreement is a legally binding international treaty signed by 196 countries at the COP 21 in Paris, on the 12th of December 2015 to combat climate change. The goal of the Paris Accord is to limit global warming to well below 2 degrees Celsius, compared to industrial levels to avoid catastrophic natural disasters which are driven by the global temperature increase. Therefore, to achieve this long-term temperature goal, countries aim to reach global peaking of greenhouse gas emissions as soon as possible to achieve a climate-neutral world by 2050.

At COP27 President Sameh Shoukry announced the *Sharm el-Sheikh Adaptation Agenda*[6], enhancing resilience for people living in the most climate-vulnerable communities by 2030. The cover decision, known as the Sharm el-Sheikh Implementation Plan, highlights that a global transformation to a low-carbon economy is expected to require investments of at least USD 4-6 trillion a year. The Sharm el-Sheikh Implementation Plan emphasises the urgent need for reduced global greenhouse gas emissions through the use of renewable energy, just energy transition partnerships and other cooperative actions. The Plan further highlights that this is a critical decade of action that requires rapid transformation towards renewable energy.

This renewable energy project aligns with the goals of the Sharm el-Sheikh Implementation Plan and the need to reduce greenhouse gas emissions and rapidly transform towards renewable energy.

4.6.2 NATIONAL PERSPECTIVE

The South African Government, through the IRP, has set a target to secure 17 800 MW of renewable energy by 2030. This is an effort to diversify the country's energy mix in response to the growing electricity demand and promote access to clean sources of energy.

The National Development Plan (NDP) is aimed at reducing and eliminating poverty in South Africa by 2030. The NDP also outlines the need to increase electricity production by 2030, with 20 000 MW of electricity capacity generated from renewable sources in order to move to less carbon-intensive electricity production. The Plan also envisages that South Africa will have an energy sector that provides reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.

The authorisation of the Tournée 2 Solar PV Facility will further align with South Africa's National Climate Response White Paper which outlines the countries efforts to manage the impacts of climate change and to contribute to the global efforts to stabilize the greenhouse gases concentrations in the atmosphere.

The proposed Tournée Solar PV Facility, will pave the way for the Just Energy Transition (JET) in South Africa and promote the transition from a fossil fuel-based economy to a low carbon economy. The proposed Tournée Solar PV Cluster aims towards the aforementioned national energy targets of diversification of energy supply and the promotion of clean energy. Wind and solar energy developments contribute to reduced emissions and subsequently climate change whilst promoting industrial development and job creation.

The proposed Tournée 2 Solar PV Facility will also aid in overcoming the power shortages that are currently faced in the country. In 2022, South Africa witnessed its longest recorded hours of load shedding, with the power being off for 1 949 hours between January and September 2022 as shown in **Figure 4-3**. The South African Government has taken strides to try reducing these power cuts through the implementation of bid Windows in REIPPP, but it is still expected that the country will undergo more load shedding. Over the years the construction of Solar and Wind facilities has

[6] https://unfccc.int/news/cop27-reaches-breakthrough-agreement-on-new-loss-and-damage-fund-for-vulnerable-countries

become cheaper, and less time-consuming. Thus, acting as a faster and more efficient method of meeting the ever-growing demand for electricity in the country. Renewable energy is a key factor in the national energy mix and will assist in ensuring that load shedding is reduced in South Africa.

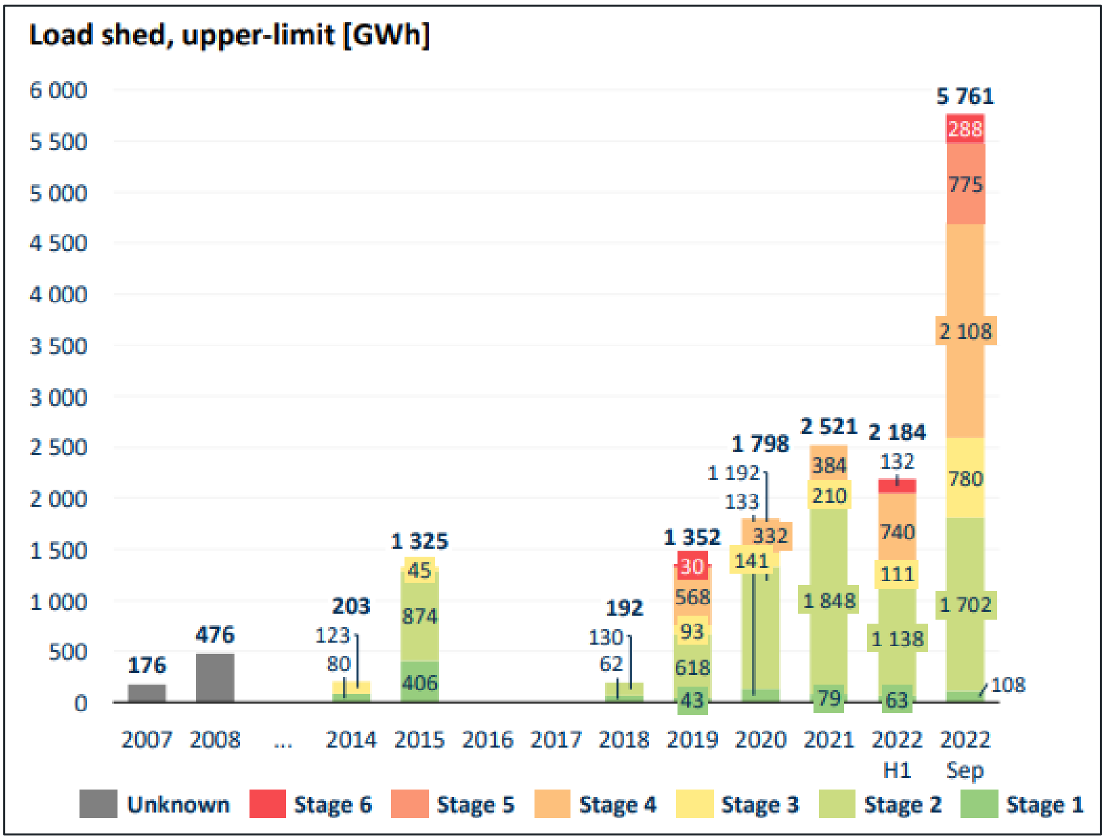


Figure 4-3 - Load shedding hours over the years in South Africa

Source: CSIR (2022)

4.6.3 REGIONAL AND LOCAL PERSPECTIVE

4.6.3.1 Just Energy Transition

Coal power stations and the coal mining industry play a vital component in the economic and social components of the local Mpumalanga economy. Shifting to a low carbon economy will thus need to offset or exceed the benefits being realized by fossil fuels in the province. Thus, a key factor to ensuring the success of the JET is not only to focus on the transition from fossil fuels to renewable energy resources but to simultaneously ensure the Just Transition of jobs and skills.

The transition towards renewable energy will improve the socio-economic conditions of the Gert Sibande District Municipality. The Gert Sibande District Municipality recorded an unemployment rate of 26.7% in 2017, with the majority of its employed in the trade and community services sectors. The Project will aid in solving two of the leading challenges faced by the Gert Sibande District Municipality, namely the cost of electricity and lack of adequate employment opportunities. As various career opportunities are presented by the solar industry, and these are divided into five pillars that are aligned with the value chain. These four pillars are project planning/development, manufacturing and procurement, installation and grid connection, operation and maintenance, and decommissioning.

The solar industry will create job opportunities throughout the supply chain. The solar industry will contribute to the Just transition in South Africa to ensure that there are no job losses but rather job transfers and skill exchange. For these opportunities to arise, renewable energy projects need to be approved in Mpumalanga to ensure that the transition from fossil fuels to renewable energy happens gradually and takes off effectively.

5 PROJECT ALTERNATIVES

The EIA Regulations of 2014 (as amended) require that the S&EIA process must identify and describe alternatives to the proposed activity that were considered, or motivation for not considering alternatives. Different types or categories of alternatives could be considered including different locations, technology types, and project layouts. At the scoping level the evaluation of alternatives is provided at a high level in the absence of detailed environmental comparators for each alternative; due to the two-staged nature of the S& EIA process it is more suitable to identify and describe the potential alternatives on a high-level basis within scoping, and to perform a more detailed analysis of alternatives (with environmental comparators) in the EIA phase of the project. As such, the S&EIA will holistically assess the impacts and risks of each alternative comparatively, as suggested by Appendix 2 of the EIA Regulations of 2014 (as amended).

All alternatives outlined below are considered both feasible and reasonable. An alternatives assessment has been undertaken and included in **Section 11.3**.

5.1 TECHNOLOGY ALTERNATIVES

5.1.1 SOLAR PV TECHNOLOGY

The Tournée 2 Solar PV Facility will utilise solar PV technology to generate power. Solar energy is considered to be the most suitable renewable energy resource for this specific site, based on the locality of the site, ambient conditions and the availability of energy resources, which in this case would be solar irradiation. PV technology is more competitive from a cost perspective and is easier to transport and build. PV technology is also preferred when compared to Concentrated Solar Power technology because of the lower visual profile. A CSP has a high visual impact and requires large volumes of water; therefore, it is not considered a viable option for this project. Therefore, Solar PV is considered the preferred technology, and no other technology alternatives was considered for this project.

5.1.2 BESS TECHNOLOGY

The BESS will be made up of Lithium-Ion batteries or similar solid-state technology. This technology was chosen due to them being a mature and safe technology with regard to potential impacts on the environment in a solar facility farm, modular and easy to install and due to their technical characteristics, will work well as energy storage systems for solar facilities, as well as supporting grid stability.

The design of the cells are completely sealed in the factories when they are manufactured, and no electrolytic liquids are thus handled on site. Furthermore, the small amount of electrolytic liquid within each cell is also almost all absorbed into the solid components in the cell thus making any significant spillage of liquid almost impossible. No other BESS technology was considered by the developer as from an environmental and design perspective it was the most favourable.

5.2 LOCATION ALTERNATIVES

The location of the proposed project is based on the site awarded to the applicant in response to an Eskom Request for Proposal (RFP). The following aspects were required by the RFP to be taken into consideration when selecting the location of the site:

- The selected location must be in close proximity to the existing Eskom infrastructure and interconnection points including substations;
- The site must be suitable open land for Solar PV development; and
- The screening process for the selected location must not identify exceedances of environmental sensitivities; and
- The selected site must contribute to the JET Programme.

The site is considered suitable and the investigation of an alternative site is not currently proposed.

5.3 LAYOUT ALTERNATIVES

During the scoping phase, the specialists investigated a preliminary layout on Remaining Portion of Portion 3 of Farm Dwars-in-die-Weg 350 IS and Portion 6 of Farm Dwars-in-die-Weg 350 IS (**Figure 5-1**). The specialists identified sensitive features and no-go areas within the property and a conceptual layout (**Figure 5-2**) of the facility was developed.

The location of the project infrastructure (i.e., layout) was determined based on initial environmental and technical screening which considered the infrastructure locations feasible from a constructability perspective. This included several key aspects including environmental constraints and opportunities, distance to grid connection, topography, site accessibility.

The conceptual layout was taken forward for assessment by the various Specialists during this EIA Phase.

Figure 5-1 – Tournée 2 Solar PV Facility Preliminary layout

Figure 5-2 – Tournée 2 Solar PV Facility Conceptual layout

5.4 NO-GO ALTERNATIVE

In the "no project" alternative, the proposed project will not be developed. In this scenario, there could be a missed opportunity to address the need for a just transition within the Province and Nationally. This project will also support the need to increase renewable energy generation in an effort to mitigate against concerns of climate change and exploitation of non-renewable resources. The no-go alternative would not assist in responding to the growing electricity demand in South Africa and would not contribute to the reliability of electricity supply at a national scale.

The "no project" alternative has been considered in the EIA phase as a baseline against which the impacts of the proposed project will be assessed.

6 GOVERNANCE FRAMEWORK

6.1 NATIONAL LEGAL AND REGULATORY FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in **Table 6-1**.

Table 6-1 – Applicable National Legislation[7]

Legislation	Description of Legislation and Applicability
The Constitution of South Africa (No. 108 of 1996)	The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld in an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.
National Environmental Management Act (No. 107 of 1998)	In terms of Section 24(2) of the NEMA, the Minister may identify activities, which may not commence without prior authorisation. The Minister thus published GNR 983 (as amended) (Listing Notice 1), GNR 984 (as amended) (Listing Notice 2) and GNR 985 (as amended) (Listing Notice 3) listing activities that may not commence prior to authorisation. The regulations outlining the procedures required for authorisation are published in the EIA Regulations of 2014 (GNR 982) (as amended). Listing Notice 1 identifies activities that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. WSP undertook a legal review of the listed activities according to the proposed project description to conclude that the activities listed in in this section are considered applicable to the development: A S&EIR process must be followed. An EA is required and will be applied for with the DFFE.
Listing Notice 1: GNR 983	***Activity 11 (i)*** *The development of facilities or infrastructure for the transmission and distribution of electricity—*

[7] It should be noted that all dimensions outlined in relation to Listing Notice 1, 2 and 3 are provisional and are subject to final design.

Legislation	Description of Legislation and Applicability
	(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts *excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —* *(a) temporarily required to allow for maintenance of existing infrastructure;* *(b) 2 kilometres or shorter in length;* *(c) within an existing transmission line servitude; and* *(d) will be removed within 18 months of the commencement of development.* **Description:** The Tournée 2 Solar PV Facility will include back-to-back substation (inclusive of the IPP and Eskom sections) and a 132 kV interconnecting Overhead Powerline. The substation will consist of a high voltage substation yard to allow for multiple 132kV feeder bays and transformers, control buildings, and telecommunication infrastructure.
	Activity 12 (ii) (a) (c) *The development of—* *(ii) infrastructure or structures with a physical footprint of 100 square metres or more;* *where such development occurs—* *(a) within a watercourse;* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;* excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared. **Description:** The Tournée 2 Solar PV Facility will require the development of internal roads

Legislation	Description of Legislation and Applicability
	and/or access roads around the site. The physical footprint of internal access roads and electrical cabling required to connect the various components of the Facility will be located within 32m of the outer extent of the delineated watercourses on site.
	Activity 14 *The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.* **Description:** The Tournée 2 Solar PV Facility will require storage and handling of dangerous goods, including fuel (e.g. diesel), cement and chemical storage onsite, with a storage capacity of no more than 500m^3.
	Activity 19 *The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;* *but excluding where such infilling, depositing, dredging, excavation, removal or moving—* *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;* *(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or* *(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.* **Description:** Internal access roads and stormwater control infrastructure, as well as electrical cabling and 132 kV interconnecting Overhead Powerline required to connect the various components of the Tournée PV 2 Facility will collectively require the excavation, infilling or removal of soil exceeding 10m^3 from delineated watercourses on site.
	Activity 24 (ii) *The development of a road—* *(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres* *but excluding a road—* *(a) which is identified and included in activity 27 in Listing Notice 2 of*

Legislation	Description of Legislation and Applicability
	2014; *(b) where the entire road falls within an urban area; or* *(c) which is 1 kilometre or shorter.* **Description:** The Tournée 2 Solar PV Facility will require the development of internal roads up to 4m in width and/or access roads around the site that will be 8m wide.
	Activity 27 *The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.* **Description:** The Tournée 2 Solar PV Facility is considered a commercial and/or industrial development, and are located on two farm portions outside an urban area, used for agricultural purposes. The total area to be developed for the Tournée PV 2 Facility (buildable area) is approximately 297ha (i.e. greater than 1 hectare) and at least 20ha of the vegetation cleared will be indigenous (Grassland Habitat).
	Activity 28(ii) *Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;* *excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.* **Description:** The Tournée 2 Solar PV Facility is considered a commercial and/or industrial development, and are located on several farm portions outside an urban area, used for agricultural purposes. The total area to be developed for the Tournée PV 2 Facility (buildable area) is approximately 297ha (i.e. greater than 1 hectare).

Legislation	Description of Legislation and Applicability
	Activity 30 *Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).* **Description:** The Tournée 2 Solar PV Facility is located within, and will require vegetation clearance or disturbance of the Soweto Highveld Grassland. The Soweto Highveld Grassland is confirmed to be listed in the National List of Ecosystems that are Threated and in Need of Protection (as indicated in GNR 1002 of 9 December 2011). Due to the fact that this ecosystem is listed as threatened it is assumed that various threatened or protected species will be found within the development area. The restricted activity of "cutting, chopping off, uprooting, damaging or destroying, any specimen" has been identified in terms of Section 53(1) of the NEM:BA and is therefore applicable to the vegetation clearance that will be required to construct the development. In light of this, Activity 30 is considered applicable.
	Activity 48(i)(a)(c) *The expansion of—* *(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more;* *where such expansion occurs—* *(a) within a watercourse;* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;* *excluding—* *(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such expansion occurs within an urban area; or* *(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.* **Description:** Transport of large infrastructure components related to both facilities will require the expansion of existing access and/or internal roads, culverts or similar drainage crossing infrastructure collectively exceeding 100m^2 or more beyond existing road or road reserves located within delineated watercourses on site, or within 32m of the outer extent of the delineated watercourses on

Legislation	Description of Legislation and Applicability
	site.
	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;* *excluding where widening or lengthening occur inside urban areas.* **Description:** Transport of large infrastructure components related to both facilities will require the widening of existing access and/or internal roads where no reserve exists and where such road is wider than 8 metres. Both facilities are located within a rural area. The access road will need to be widened by 8m, and the internal road will be widened by 4m and lengthened by 16km.
Listing Notice 2: GNR 984	***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* **Description:** The project comprises a Solar PV Facility allowing for a contracted capacity of 150MW .
	Activity 15 *The clearance of an area of 20 hectares or more of indigenous vegetation* **Description:** The clearance required for the Facility will be approximately 297ha and at least 20ha of the vegetation cleared will be indigenous (Grassland Habitat).
Listing Notice 3: GNR 985	***Activity 4 (f) (ii) (ee)*** *The development of a road wider than 4 metres with a reserve less than 13,5 metres.* *(f) Mpumalanga-* *(ii) areas outside urban areas* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* **Description:**

Legislation	Description of Legislation and Applicability
	Tournée 2 Solar PV Facility is located outside an urban area. According to the Mpumalanga Biodiversity Sector Plan Freshwater database (2019), the wetlands indicated by the National Freshwater Ecosystem Priority Area (2011), National Biodiversity Assessment (2018) and Mpumalanga Highveld Wetlands (2019) databases are indicated as Ecological Support Areas (ESAs). A very small portion of the proposed Tournée 2 Solar PV Facility is identified as Optimal CBA (approximately 0.33 ha) as identified by the Mpumalanga Biodiversity Sector Plan (2019). Transport of large infrastructure components related to the Tournée 2 Solar PV Facility will require the construction of access and/or internal roads that will be wider than 4m. The access and/or internal roads are anticipated to traverse the wetlands.
	Activity 10 (f) (i) (ee) (hh) *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.* *(f) Mpumalanga* *i. Outside urban areas:* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* *(hh) Areas within a watercourse or wetland, or within 100 metres of a watercourse or wetland;* **Description:** Tournée 2 Solar PV Facility is located outside an urban area. According to the Mpumalanga Biodiversity Sector Plan Freshwater database (2019), the wetlands indicated by the National Freshwater Ecosystem Priority Area (2011), National Biodiversity Assessment (2018) and Mpumalanga Highveld Wetlands (2019) databases are indicated as ESAs. A very small portion of the proposed Tournée 2 Solar PV Facility is identified as Optimal CBA (approximately 0.33 ha) as identified by the Mpumalanga Biodiversity Sector Plan (2019). Tournée 2 Solar PV Facility will require storage and handling of dangerous goods, including fuel (e.g. diesel), cement and chemical storage onsite, that will be greater than 30m^3 but not exceeding 80m^3. These facilities have been considered for development within the ESA or within 100 m of a watercourse.
	Activity 12 (f) (ii) *The clearance of an area of 300 square metres or more of indigenous vegetation. Except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.*

Legislation	Description of Legislation and Applicability
	(f) Mpumalanga *ii. Within critical biodiversity areas identified in bioregional plans;* **Description:** Tournée 2 Solar PV Facility is located outside an urban area. According to the Mpumalanga Biodiversity Sector Plan Freshwater database (2019), the wetlands indicated by the National Freshwater Ecosystem Priority Area (2011), National Biodiversity Assessment (2018) and Mpumalanga Highveld Wetlands (2019) databases are indicated as ESAs. A very small portion of the proposed Tournée 2 Solar PV Facility is identified as Optimal CBA (approximately 0.33 ha) as identified by the Mpumalanga Biodiversity Sector Plan (2019). It is anticipated that the construction of the Tournée 2 Solar PV Facility will require clearance of at least 300m^2 of indigenous vegetation within the ESAs.
	Activity 14 (ii) (a) (c) (f) (i) (ff) *The development of—* *(ii) infrastructure or structures with a physical footprint of 10 square metres or more;* *where such development occurs—* *(a) within a watercourse; or* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;* *excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.* *(f) Mpumalanga* *i. Outside urban areas:* *(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* **Description:** Tournée 2 Solar PV Facility is located outside an urban area. According to the Mpumalanga Biodiversity Sector Plan Freshwater database (2019), the wetlands indicated by the National Freshwater Ecosystem Priority Area (2011), National Biodiversity Assessment (2018) and Mpumalanga Highveld Wetlands (2019) databases are indicated as ESAs. A very small portion of the proposed Tournée 2 Solar PV Facility is identified as Optimal CBA (approximately 0.33 ha) as identified by the Mpumalanga Biodiversity Sector Plan (2019). The cabling, access and/or internal roads are anticipated to traverse the ESAs associated with the wetland areas, and will required the development of

Legislation	Description of Legislation and Applicability
	infrastructure or structures with a physical footprint of $10m^2$ or more.
	Activity 18 (f) (i) (ee) *The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.* *f. Mpumalanga* *i. Outside urban areas* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* **Description:** Tournée 2 Solar PV Facility is located outside an urban area. According to the Mpumalanga Biodiversity Sector Plan Freshwater database (2019), the wetlands indicated by the National Freshwater Ecosystem Priority Area (2011), National Biodiversity Assessment (2018) and Mpumalanga Highveld Wetlands (2019) databases are indicated as ESAs. A very small portion of the proposed Tournée 2 Solar PV Facility is identified as Optimal CBA (approximately 0.33 ha) as identified by the Mpumalanga Biodiversity Sector Plan (2019). Transport of large infrastructure components related to both facilities will require the widening of existing access and/or internal roads where no reserve exists and where such road requires widening by more than 4m. The existing access and/or internal roads are anticipated to traverse the wetlands.
	Activity 23 (ii) (a) (c) (f) (ee) *The expansion of—* *(ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more;* *where such expansion occurs —* *(a) within a watercourse;* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;* *excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.* *f. Mpumalanga* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* **Description:** Tournée 2 Solar PV Facility is located outside an urban area. According to the Mpumalanga Biodiversity Sector Plan Freshwater database

Legislation	Description of Legislation and Applicability
	(2019), the wetlands indicated by the National Freshwater Ecosystem Priority Area (2011), National Biodiversity Assessment (2018) and Mpumalanga Highveld Wetlands (2019) databases are indicated as ESAs. A very small portion of the proposed Tournée 2 Solar PV Facility is identified as Optimal CBA (approximately 0.33 ha) as identified by the Mpumalanga Biodiversity Sector Plan (2019). The cabling, access and/or internal roads are anticipated to traverse the ESAs associated with the wetland areas, and will required the expansion of infrastructure or structures with a physical footprint of 10m^2 or more.
Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes (GNR 320, 20 March 2020 and GNR 1150, 30 October 2020)	The protocols provide the criteria for specialist assessment and minimum report content requirements for impacts for various environmental themes for activities requiring environmental authorisation. The protocols replace the requirements of Appendix 6 of the EIA Regulations, 2014, as amended. The assessment and reporting requirements of the protocols are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (screening tool). The following environmental themes were applicable to the Tournée 2 Solar PV Facility: ▪ Agriculture Theme ▪ Animal Species Theme ▪ Aquatic Biodiversity Theme ▪ Archaeological and Cultural Heritage Theme ▪ Avian Theme ▪ Civil Aviation (Solar PV) Theme ▪ Defence Theme ▪ Landscape (Solar) Theme ▪ Palaeontology Theme ▪ Plant Species Theme ▪ Radio Frequency Interference (RFI) Theme ▪ Terrestrial Biodiversity Theme
Renewable Energy Development Zones and Strategic Transmission Corridors	On 16 February 2018, the DFFE gazetted the REDZ and Strategic Transmission Corridors and Procedures for the Assessment of Large-scale Wind and Solar Photovoltaic Energy Development Activities (GN 114) and Grid Infrastructure (GN 113). Subsequently, on 26 February 2021 a further three REDZ were gazetted (GN 142). The procedure allows for wind and solar PV activities within the eight REDZs and electricity grid development within the five power corridors to be subjected to a BA and not a full S&EIA process. In addition, the timeframes associated with the decision on the application is reduced from 107 days to 57 days. **The Tournée 2 Solar PV Facility is not located within a REDZ or a Strategic Transmission Corridor.**
National Environmental Management: Waste Act (59 of 2008) (NEM:WA)	This Act provides for regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation. The Act also provides for the licensing and control of waste management activities through GNR. 921 (2013): List of Waste Management Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment.

Legislation	Description of Legislation and Applicability
	The proposed project does not constitute a Listed Activity requiring a Waste Management Licence (WML) as defined in GNR 921. However, the contents of this Scoping Report will include reasonable measures for the prevention of pollution and good international industry practice (GIIP).
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) was promulgated in June 2004 within the framework of NEMA to provide for the management and conservation of national biodiversity. The NEMBA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, the NEMBA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI). SANBI was established by the NEMBA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems. The terrestrial biodiversity assessment (**Appendix H.5**) identifies A very small portion of the proposed Tournée 2 Solar PV Facility is identified as Optimal CBA (approximately 0.33 ha). During the site assessment, the area associated with the CBA was not confirmed to be representative for the targets set for a CBA as these areas were transformed by current cultivation areas. The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) Regulations with regards to alien and invasive species have been superseded by the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014. Specific management measures for the control of alien and invasive plants will be included in the EMPr.
National Environmental Management Protected Areas Act (No. 57 of 2003)	The purpose of the National Environmental Management Protected Areas Act (No. 57 of 2003) (NEMPAA) is to, *inter alia*, provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. To this end, it provides for the declaration and management of various types of protected areas. Section 50(5) of NEMPAA states that "no development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority." According to the National Parks Area Expansion Strategy (NPAES), there are no areas within the study area that have been identified as priority areas for inclusion in future protected areas. The study area is therefore outside the NPAES focus area.
The National Water Act (No. 36 Of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural

Legislation	Description of Legislation and Applicability
	channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water that the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the DWS if they are under certain thresholds or meet certain criteria. The list of water uses applicable to the proposed Project include: a) Taking water from a water resource; c) Impeding or diverting the flow of water in a watercourse; g) Disposing of waste in a manner which may detrimentally impact on a water resource; i) Altering the bed, banks, course or characteristics of a watercourse; The DWS will make the final decision on water uses that are applicable to the project through a pre-application meeting after which a Water Use Authorisation Application (WUA) as determined by the risk assessment will be undertaken in compliance with procedural regulations published by the DWS within General Notice 267 (GN267). These regulations specify required information per water use and the reporting structure of required supporting technical information.
The National Heritage Resources Act (No. 25 Of 1999)	The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA) and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development. Part 2 of the NHRA details specific activities that require a Heritage Impact Assessment (HIA) that will need to be approved by SAHRA. Parts of Section 35, 36 and 38 apply to the proposed project, principally: ▪ Section 35 (4) - No person may, without a permit issued by the responsible heritage resources authority- • destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite; • destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite. ▪ Section 38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as- • any development or other activity which will change the character of a site— (i) exceeding 5 000 m2 in extent, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section

Legislation	Description of Legislation and Applicability
	38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the proposed Tournée 2 Solar PV Facility, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668). A Heritage Report has been carried out by a suitably qualified specialist and is included in **Appendix H.8**. The proposed project has been loaded onto the SAHRIS portal for comment by SAHRA.
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	In South Africa, environmental noise control has been in place for three decades, beginning in the 1980s with codes of practice issued by the South African National Standards (formerly the South African Bureau of Standards, SABS) to address noise pollution in various sectors of the country. Under the previous generation of environmental legislation, specifically the Environmental Conservation Act 73 of 1989 (ECA), provisions were made to control noise from a National level in the form of the Noise Control Regulations (GNR 154 of January 1992). In later years, the ECA was replaced by the National Environmental Management Act 107 of 1998 (NEMA) as amended. The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) was published in line with NEMA and contains noise control provisions under Section 34: (1) The minister may prescribe essential national standards – (a) for the control of noise, either in general or by specific machinery or activities or in specified places or areas; or (b) for determining – (i) a definition of noise; and (ii) the maximum levels of noise. (2) When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards. Under NEMAQA, the Noise Control Regulations were updated and are to be applied to all provinces in South Africa. The Noise Control Regulations give all the responsibilities of enforcement to the Local Provincial Authority, where location specific by-laws can be created and applied to the locations with approval of Provincial Government. Where province-specific regulations have not been promulgated, acoustic impact assessments must follow the Noise Control Regulations. Furthermore, NEMAQA prescribes that the Minister must publish maximum allowable noise levels for different districts and national noise standards. These have not yet been accomplished and as a result all monitoring and assessments are done in accordance with the South African National Standards (SANS) 10103:2008 and 10328:2008. A Noise Compliance Statement has been compiled for the project and is included in **Appendix H.2.**
National Environment Management Air Quality Act	NEMAQA came into effect on 11 September 2005. Persons undertaking such activities listed under GNR 893, as amended, are required to possess an

Legislation	Description of Legislation and Applicability
(No. 39 of 2004)	Atmospheric Emissions License (AEL). The National Dust Control Regulations (GNR 827) were promulgated in terms of Section 32 of NEMAQA, which aim at prescribing general measures for the control of dust in both residential and non-residential areas. Although no AEL will be required for the construction and operation of the Tournée 2 Solar PV Facility, the dust control regulations will be applicable during construction. An Air Quality Compliance Statement has been compiled for the project and is included in **Appendix H.1**.
Conservation of Agricultural Resources Act (No. 43 of 1983)	CARA provides for the implementation of control measures for soil conservation works as well as alien and invasive plant species in and outside of urban areas. In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties. Various Acts administered by the DFFE and the DWS, as well as other laws (including local by-laws), detail the fines, terms of imprisonment and other penalties for contravening the law. Although no fines have yet been placed against landowners who do not remove invasive species, the authorities may clear their land of invasive alien plants and other alien species entirely at the landowners' cost and risk. The CARA Regulations with regards to alien and invasive species have been superseded by NEMBA AIS Regulations which became law on 1 October 2014.
Civil Aviation Act (No. 13 of 2009)	Civil aviation in South Africa is governed by the Civil Aviation Act (Act 13 of 2009). This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by South African Civil Aviation Authority (SACAA) as an agency of the Department of Transport (DoT). SACAA achieves the objectives set out in the Act by complying with the Standards and Recommended Practices (SARPs) of the International Civil Aviation Organisation (ICAO), while considering the local context when issuing the South African Civil Aviation Regulations (SA CARs). As of the 1st of May 2021, Air Traffic and Navigation Services (ATNS) has been appointed as the new Obstacle application Service Provider for Windfarms and later Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Windfarms and in due time Power Plant assessments. The DFFE Screening Tool Report identified Civil Aviation as having medium sensitivity for the proposed Tournée 2 Solar PV Facility, and no major or other types of civil aviation aerodromes. ATNS and SACAA is included on the project stakeholder database. They have been informed of the proposed Project, and comment will be sought from these authorities as applicable.
Occupational Health and Safety Act (No. 85 of 1993)	The National Occupational Health and Safety Act (No. 85 of 1993) (OHSA) and the relevant regulations under the Act are applicable to the proposed project. This includes the Construction Regulations promulgated in 2014

Legislation	Description of Legislation and Applicability
	under Section 43 of the Act. Adherence to South Africa's OHSA and its relevant Regulations is essential.
National Energy Act (No. 34 of 2008)	The National Energy Act aims to ensure that diverse energy resources are available, in sustainable quantitates, and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors. The main objectives of the Act are to: ▪ Ensure uninterrupted supply of energy to the Republic; ▪ Promote diversity of supply of energy and its sources; ▪ Facilitate effective management of energy demand and its conservation; ▪ Promote energy research; ▪ Promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy; ▪ Ensure collection of data and information relating to energy supply, transportation and demand; ▪ Provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development; ▪ Provide for certain safety, health and environment matters that pertain to energy; ▪ Facilitate energy access for improvement of the quality of life of the people of Republic; ▪ Commercialise energy-related technologies; ▪ Ensure effective planning for energy supply, transportation, and consumption; and ▪ Contribute to sustainable development of South Africa's economy. In terms of the act, the Minister of Energy is mandated to develop and, on an annual basis, review and publish the Integrated Energy Plan (IEP) in the Government Gazette. The IEP analyses current energy consumption trends within different sectors of the economy (i.e. agriculture, commerce, industry, residential and transport) and uses this to project future energy requirements, based on different scenarios. The IEP and the Integrated Resource Plan are intended to be updated periodically to remain relevant. The framework is intended to create a balance between energy demand and resource availability so as to provide low-cost electricity for social and economic development, while taking into account health, safety and environmental parameters.
Electricity Regulation Act (No. 4 of 2006)	The Electricity Regulation Act (No. 4 of 2006) (ERA) aims to: ▪ Achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa; ▪ Ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency. effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic: ▪ Facilitate investment in the electricity supply industry; ▪ Facilitate universal access to electricity; ▪ Promote the use of diverse energy sources and energy efficiency;

Legislation	Description of Legislation and Applicability
	▪ Promote competitiveness and customer and end user choice; and ▪ Facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public. The Act establishes a National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated.

6.2 POLICIES AND PLANS

Table 6-2 summarised key policies and plans as an outline of the governance framework for the project.

Table 6-2 – Applicable Regional Policies and Plans

Applicable Policy	Description of Policy
National Development Plan	The National Development Plan (NDP) aims to eliminate poverty and reduce inequality by 2030. The NDP identifies a number of enabling milestones. Of relevance to the proposed development the NDP refers to the need to produce sufficient energy to support industry at competitive prices and ensure access for poor households, while reducing carbon emissions per unit of power by about one-third. In this regard the infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development. Chapter 3, Economy and Employment, identifies some of the structural challenges specific to South Africa, including an energy constraint that will act as a cap on growth and on options for industrialisation. The NDP notes that from an environmental perspective South Africa faces several related challenges. The reduction of greenhouse gas emissions and shift to a green low-carbon economy, is one of these challenges. In terms of implementation the NDP identifies three phases. The first two are of specific relevance to the proposed project. The first phase (2012–2017) notes that ensuring the supply of energy and water is reliable and sufficient for a growing economy. The second phase (2018–2023) involves building on the first phase to lay the foundations for more intensive improvements in productivity. The provision of affordable and reliable energy is a key requirement for this to take place. Chapter 4, Economic infrastructure, notes that economic infrastructure provides the foundation for social and economic development. In this regard South Africa must invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives. The plan envisages that, by 2030, South Africa will have an energy sector that promotes: ▪ Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation. ▪ Environmental sustainability through efforts to reduce pollution and

Applicable Policy	Description of Policy
	mitigate the effects of climate change. More specifically, South Africa should have adequate supply security in electricity and in liquid fuels, such that economic activity, transport, and welfare are not disrupted. The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation. In this regard coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources, will play a much larger role.
Integrated Resource Plan 2010 – 2030	The IRP is an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost. On 6 May 2011, the then Department of Energy (DoE) released the Integrated Resource Plan 2010-2030 (IRP 2010) in respect of South Africa's forecast energy demand for the 20-year period from 2010 to 2030. The promulgated IRP 2010–2030 identified the preferred generation technology required to meet expected demand growth up to 2030. It incorporated government objectives such as affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversified electricity generation sources, localisation and regional development. The IRP recognises that solar PV, wind and CSP with storage present an opportunity to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Renewable technologies also present huge potential for the creation of new industries, job creation and localisation across the value chain.
New Growth Path	Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: energy, transport, communication, water, and housing.
National Infrastructure Plan	The South African Government adopted a National Infrastructure Plan (NIP) in 2012. The NIP aims to transform the South African economic landscape while simultaneously creating significant numbers of new jobs and strengthening the delivery of basic services. It outlines the challenges and enablers which needs to be addressed in the building and developing of infrastructure. The Presidential Infrastructure Coordinating Commission (PICC) was established by the Cabinet to integrate and coordinate the long-term infrastructure build. The plan also supports the integration of African economies. In terms of the plan Government will invest R827 billion over the next three years to build new and upgrade existing infrastructure. The aim of the investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to improved economic growth.

Applicable Policy	Description of Policy
Integrated Energy Plan	The development of a National IEP was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and, in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and, on an annual basis, review and publish the IEP in the Government Gazette. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development. The IEP notes that South Africa needs to grow its energy supply to support economic expansion and in so doing, alleviate supply bottlenecks and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process, eight key objectives are identified, namely: ▪ Objective 1: Ensure security of supply. ▪ Objective 2: Minimise the cost of energy. ▪ Objective 3: Promote the creation of jobs and localisation. ▪ Objective 4: Minimise negative environmental impacts from the energy sector. ▪ Objective 5: Promote the conservation of water. ▪ Objective 6: Diversify supply sources and primary sources of energy. ▪ Objective 7: Promote energy efficiency in the economy. ▪ Objective 8: Increase access to modern energy. The IEP provides an assessment of current energy consumption trends within different sectors of the economy (i.e., agriculture, commerce, industry, residential and transport) and uses this information to identify future energy requirements, based on different scenarios. The scenarios are informed by different assumptions on economic development and the structure of the economy and also take into account the impact of key policies such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others. Based on this information the IEP then determines the optimal mix of energy sources and technologies to meet those energy needs in the most cost-effective manner for each of the scenarios. The associated environmental impacts, socio-economic benefits and macroeconomic impacts are also analysed. The IEP is therefore focused on determining the long-term energy pathway for South Africa, taking into account a multitude of factors which are embedded in the eight objectives. As part of the analysis four key scenarios were developed, namely the Base Case, Environmental Awareness, Resource Constrained and Green Shoots scenarios: ▪ The Base Case Scenario assumes that existing policies are implemented and will continue to shape the energy sector landscape going forward. It assumes moderate economic growth in the medium to long term. ▪ The Environmental Awareness Scenario is characterised by more stringent emission limits and a more environmentally aware society, where a higher cost is placed on externalities caused by the supply of energy. ▪ The Resource Constrained Scenario in which global energy commodity prices (i.e. coal, crude oil and natural gas) are high due to limited supply. ▪ The Green Shoots Scenario describes an economy in which the targets for high economic growth and structural changes to the economy, as set

Applicable Policy	Description of Policy
	out in the National Development Plan (NDP), are met. The IEP notes that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources. In terms of existing electricity generation capacity, the IEP indicates that existing capacity starts to decline notably from 2025, with significant plant retirement occurring in 2031, 2041 and 2048. By 2050 only 20% of the current electricity generation capacity remains. As a result, large investments are required in the electricity sector in order to maintain an adequate supply in support of economic growth. By 2020, various import options become available, and some new coal capacity is added along with new wind, solar and gas capacity. The mix of generation capacity technologies by 2050 is considerably more diverse than the current energy mix, across all scenarios. The main differentiating factors between the scenarios are the level of demand, constraints on emission limits and the carbon dioxide externality costs. In all scenarios the energy mix for electricity generation becomes more diverse over the period to 2050, with coal reducing its share from about 85% in 2015 to 15–20% in 2050 (depending on the scenario). Solar, wind, nuclear, gas and electricity imports increase their share. The Environmental Awareness and Green Shoots scenarios take on higher levels of renewable energy. An assessment of each scenario against the eight objectives with reference to renewable energy notes while all scenarios seek to ensure that costs are minimised within the constraints and parameters of each scenario, the Base Case Scenario presents the least cost followed by the Environmental Awareness, Resource Constrained and Green Shoots scenarios respectively when total energy system costs are considered. In terms of promoting job creation and localisation potential the Base Case Scenario presents the greatest job creation potential, followed by the Resource Constrained, Environmental Awareness and Green Shoots scenarios respectively. In all scenarios, approximately 85% of total jobs are localisable. For electricity generation, most jobs result from solar technologies followed by nuclear and wind, with natural gas and coal making a smaller contribution. The Environmental Awareness Scenario, due to its stringent emission constraints, shows the lowest level of total emissions over the planning horizon. This is followed by the Green Shoots, Resource Constrained and Base Case scenarios. These trends are similar when emissions are considered cumulatively and individually by type.
National Protected Area Expansion Strategy, 2010	The National Protected Area Expansion Strategy 2010 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2010). According to the NPAES, there are no areas within the study area that have been identified as priority areas for inclusion in future protected areas. The study area is therefore outside the NPAES focus area.

6.3 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK

Table 6-3 – Provincial Plans

Applicable Plan	Description of Plan
Mpumalanga Growth and Development Path	The primary objective of the Mpumalanga Economic Growth and Development Path (MEGDP) (2011) is to foster economic growth that creates jobs, reduce poverty and inequality in the Province. The MEGDP identifies supporting the development of clean forms of energy such as wind and hydro power generation opportunities, as well as opportunities including gas production from landfill and organic waste, as one of the key interventions to facilitate growth and job creation in the manufacturing sector. A focal point of the MEGDP is massive investments in infrastructure as a key driver of job creation across the economy, with alternative energy production identified as one of the key opportunities in the Mpumalanga Economic sectors.
Mpumalanga Spatial Development Framework (MSDF), 2019	The Mpumalanga Spatial Development Framework (SDF) (2019) identifies that tourism is an important economic sector and has emerged as a robust driver of growth for emerging economies. The SDF also notes that a significant portion of Mpumalanga's land area is classified as Moderate to High-Very High agricultural potential which can be utilised for agricultural production. However, there are other factors affecting the agricultural sector including loss of agricultural land to other activities, availability of water, contamination of the water used for irrigation by other economic activities, and access to the market. The SDF further notes that mining is the largest economic sector in the province and has assisted other sectors such as manufacturing and power generation, to grow in the province. However, the mining sector has posed some key challenges, including soil and water contamination and environmental pollution, development of mines on good agricultural soil thus threatening food security, restriction of animal movement due to open cast mining thus affecting the ecosystem etc. It also notes that Mpumalanga's manufacturing plants and coal fired power plants are the key polluters of air, with climate change also identified as a key challenge in the province. Therefore, the province must carefully design interventions that provide a gradual shift from mining oriented sectors to the sustainable economic sectors to maintain sustained growth of the provincial economy. The SDF notes that a significant amount of the country's electricity comes from coal-fired stations in Mpumalanga. It also observes that there is a steady increase in the demand for electricity in the province, mostly attributed to residential, commercial and industrial development, including mining and heavy industry. The Provincial SDF also notes that the abundance of coal has led to the development of many coal-fired power stations in the province, however these coalfields are depleting, therefore making it necessary to consider renewable power sources in Mpumalanga. The SDF also recognises that Mpumalanga's Coal Mining and Coal Fired Power Plant region (mainly the Highveld area) will be under immense pressure for environmental considerations and as a result, the region will witness a possible decline in demand of coal and large-scale employment. The SDF proposes to diversify the regional economy and facilitate the gradual transition of economic activities in the region.
Mpumalanga Industrial Development Plan	In terms of industry, the purpose of the Mpumalanga Industrial Development Plan (MIDP) (2015) is to promote the establishment of new industries and promote growth of existing industries in the province.

Applicable Plan	Description of Plan
Mpumalanga Conservation Act (No. 10 of 1998)	This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other regulations, the following may apply to the current project: ▪ Various species are protected; ▪ The owner of land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species. The Act provides lists of protected species for the Province. According to the Mpumalanga Nature Conservation Act, a permit is required for the removal of any species on this list.

Table 6-4 - District and Local Municipality Plans

Applicable Plan	Description of Plan
Gert Sibande Municipality Integrated Development Plan	According to the Municipal Systems Act (Act 32 of 2000) (MSA), all municipalities have to undertake an IDP process. The IDP is a legislative requirement thus it has legal status and supersedes all other plans that guide development at local government level. The GSDM IDP Review (2019/ 2020) and Final IDP (2020/2021) has identified the following development priorities: ▪ Municipal Transformation and Organisational Development ▪ Basic Service Delivery and Infrastructure Development ▪ Local Economic Development ▪ Municipal Financial Viability and Management ▪ Good Governance and Public Participation ▪ Spatial Development Analysis and Rationale The main goal and strategic objective of the Basic Service Delivery and Infrastructure Development priority is a reliable and sustainable service. One of the main strategic objectives for reaching the goal is the provision of basic services such as water and electricity to an approved minimum level of standards in a sustainable manner; as per the national guidelines.
Lekwa Local Municipality Integrated Development Plan	The vision of the LLM is “to be the leading, people centred municipality excelling in economic growth, development and governance”. The mission that underpins the vision is: ▪ Transparent and accountable governance. ▪ Accelerated customer focused affordable service delivery. ▪ Creation of conducive environment for economic development and growth. ▪ Sustainable infrastructural development and maintenance. ▪ Enhance community participation in the affairs of the municipality. ▪ To initiate ground breaking innovations in the way we conduct our business. The IDP lists a number of Strategic Goals (SGs) and Key Performance Areas (KPAs) of which the following are relevant to the project.: ▪ SG: • Improved access to water, sanitation, electricity, and waste removal

Applicable Plan	Description of Plan
	• Increased Economic growth ▪ KPA: • KPA 1: Basic services delivery and infrastructure development • KPA 4: Local Economic Development

6.4 INTERNATIONAL STANDARDS AND GUIDELINES

6.4.1 IFC PERFORMANCE STANDARDS

The International Finance Corporation (IFC) is an international financial institution that offers investment, advisory, and asset management services to encourage private sector development in developing countries. The IFC is a member of the World Bank Group (WBG) and is headquartered in Washington, D.C., United States. It was established in 1956 as the private sector arm of the WBG to advance economic development by investing in strictly for-profit and commercial projects that purport to reduce poverty and promote development.

The IFC's stated aim is to create opportunities for people to escape poverty and achieve better living standards by mobilizing financial resources for private enterprise, promoting accessible and competitive markets, supporting businesses and other private sector entities, and creating jobs and delivering necessary services to those who are poverty-stricken or otherwise vulnerable. Since 2009, the IFC has focused on a set of development goals that its projects are expected to target. Its goals are to increase sustainable agriculture opportunities, improve health and education, increase access to financing for microfinance and business clients, advance infrastructure, help small businesses grow revenues, and invest in climate health.

The IFC is owned and governed by its member countries but has its own executive leadership and staff that conduct its normal business operations. It is a corporation whose shareholders are member governments that provide paid-in capital and which have the right to vote on its matters. Originally more financially integrated with the WBG, the IFC was established separately and eventually became authorized to operate as a financially autonomous entity and make independent investment decisions. It offers an array of debt and equity financing services and helps companies face their risk exposures, while refraining from participating in a management capacity. The corporation also offers advice to companies on making decisions, evaluating their impact on the environment and society, and being responsible. It advises governments on building infrastructure and partnerships to further support private sector development.

The IFC’s Sustainability Framework articulates the Corporation’s strategic commitment to sustainable development and is an integral part of IFC’s approach to risk management. The Sustainability Framework comprises IFC’s Policy and Performance Standards on Environmental and Social Sustainability, and IFC’s Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC’s commitments, roles, and responsibilities related to environmental and social sustainability. IFC’s Access to Information Policy reflects IFC’s commitment to transparency and good governance on its operations and outlines the Corporation’s institutional disclosure obligations regarding its investment and advisory services. The Performance Standards (PSs) are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the PSs to manage environmental and social risks and impacts so that development opportunities are enhanced. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation to achieve its overall development objectives. The PSs may also be applied by other financial institutions (FIs).

The Project is considered a **Category B project** in terms of the IFC Policy on E&S Sustainability (2012), having the potential to cause limited adverse environmental or social risks and/or impacts that are few in number, generally site specific, largely reversible, and readily addressed through mitigation measures.

The objectives and applicability of the eight PSs are outlined in **Table 6-5.**

Table 6-5 – Objectives and Applicability of the IFC Performance Standards

Reference	Requirements		Project Specific Applicability
Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts			
Overview	Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project. An effective Environmental and Social Management System (ESMS) is a dynamic and continuous process initiated and supported by management, and involves engagement between the client, its workers, local communities directly affected by the project (the Affected Communities) and, where appropriate, other stakeholders.		
Objectives	▪ To identify and evaluate environmental and social risks and impacts of the project. ▪ To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment. ▪ To promote improved environmental and social performance of clients through the effective use of management systems. ▪ To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately. ▪ To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.		
Aspects	1.1	Policy	The IFC Standards state under PS 1 (Guidance Note 23) that "*the breadth, depth and type of analysis included in an ESIA must be proportionate to the nature and scale of the proposed project's potential impacts as identified during the course of the assessment process*." This document is the draft deliverable from the S&EIA process undertaken for the proposed Project. The impact assessment comprehensively assesses the (1) key environmental and (2) social impacts and complies with the requirements of the South African EIA Regulations. In addition, an EMPr has been compiled and included in **Appendix I**.
	1.2	Identification of Risks and Impacts	
	1.3	Management Programmes	
	1.4	Organisational Capacity and Competency	
	1.5	Emergency Preparedness and Response	

Reference	Requirements		Project Specific Applicability
	1.6	Monitoring and Review	
	1.7	Stakeholder Engagement	
	1.8	External Communication and Grievance Mechanism	
	1.9	Ongoing Reporting to Affected Communities	
Performance Standard 2: Labour and Working Conditions;			
Overview	Performance Standard 2 recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.		
Objectives	▪ To promote the fair treatment, non-discrimination, and equal opportunity of workers. ▪ To establish, maintain, and improve the worker-management relationship. ▪ To promote compliance with national employment and labour laws. ▪ To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain. ▪ To promote safe and healthy working conditions, and the health of workers. ▪ To avoid the use of forced labour.		
Aspects	2.1	▪ Working Conditions and Management of Worker Relationship ▪ Human Resources Policy and Management ▪ Working Conditions and terms of Engagement ▪ Workers organisation ▪ Non- Discrimination and Equal Opportunity ▪ Retrenchment ▪ Grievance Mechanism	Even though the nature and scale of the project is considered to be small, PS2 is considered applicable as a contractor will be appointed to undertake the required scope of work. Whilst PS2 will be applicable to the Project, it is not intended to be addressed in detail at the EIA stage. Recommendations are provided concerning development of a detailed Human Resources (HR) and Occupational Health and Safety (OHS) system by the developer and its partners as the Project moves towards implementation. In addition, measures to address the Interim Advice for IFC Clients on Supporting Workers in the Context of communicable diseases are referenced. The EMPr incorporates the requirements for compliance with local and international Labour and Working legislation and good practice on the part of the contractors.
	2.2	▪ Protecting the Workforce ▪ Child Labour ▪ Forced Labour	
	2.3	Occupational health and Safety	
	2.4	Workers Engaged by Third Parties	
	2.5	Supply Chain	

Reference	Requirements		Project Specific Applicability
Performance Standard 3: Resource Efficiency and Pollution Prevention			
Overview	Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. There is also a growing global consensus that the current and projected atmospheric concentration of greenhouse gases (GHG) threatens the public health and welfare of current and future generations. At the same time, more efficient and effective resource use and pollution prevention and GHG emission avoidance and mitigation technologies and practices have become more accessible and achievable in virtually all parts of the world.		
Objectives	▪ To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities. ▪ To promote more sustainable use of resources, including energy and water. ▪ To reduce project related GHG emissions.		
Aspects	3.1	▪ Policy Resource Efficiency ▪ Greenhouse Gases ▪ Water Consumption	PS3-related impacts, such as the management of construction waste, hazardous substances, and stormwater are assessed in **Section 9** of this report. There are no material resource efficiency issues associated with the Project. The EMPr will include general resource efficiency measures. The project is not GHG emissions intensive and a climate resilience study or a GHG emissions-related assessment is not deemed necessary for a project of this nature. However, the Tournée 2 Solar PV Facility seeks to facilitate resource efficiency and pollution prevention by contributing to the South African green economy. Dust air pollution in the construction phase has been addressed in the EMPr. The Project will not result in the release of industrial effluents. Potential pollution associated with sanitary wastewater is low and mitigation measures is included in the EMPr. Land contamination of the site from historical land use (i.e. low intensity agricultural / grazing) is not considered to be a cause for concern. The waste generation profile of the project is not complex. Waste mitigation and management measures is included in EMPr. The management of vectors and pests have been addressed in the EMPr by various specialists studies providing mitigation measures to prevent and discourage the spread. The mitigation measures are included in Section 7 of the EMPr. Hazardous materials are not a key issue; small quantities of construction materials (oil, grease, diesel fuel etc.) are the only wastes expected to be associated with the project. The EMPr takes these anticipated hazardous materials into account and recommend relevant mitigation and management measures.
	3.2	▪ Pollution Prevention ▪ Air Emissions ▪ Stormwater ▪ Waste Management ▪ Hazardous Materials Management ▪ Pesticide use and Management	

Reference	Requirements		Project Specific Applicability
Performance Standard 4: Community Health, Safety, and Security			
Overview	Performance Standard 4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts.		
Objectives	▪ To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. ▪ To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities		
Aspects	4.1	▪ Community Health and Safety ▪ Infrastructure and Equipment Design and Safety ▪ Hazardous Materials Management and Safety ▪ Ecosystem Services ▪ Community Exposure to Disease ▪ Emergency Preparedness and Response	The requirements included in PS 4 will be addressed in the EIA process and the development of the EMPr. During the construction phase there will be an increase in vehicular traffic along public roads, largely due to the need for importation of construction material. Pedestrian and road safety risks will be qualitatively evaluated in the EIA process and the clients' standard safety and security measures, as well as potential additional measures recommended by WSP, are detailed in the EMPr.
	4.2	Security Personnel	
Performance Standard 5: Land Acquisition and Involuntary Resettlement			
Overview	Performance Standard 5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) as a result of project-related land acquisition and/or restrictions on land use.		
Objectives	▪ To avoid, and when avoidance is not possible, minimise displacement by exploring alternative project designs. ▪ To avoid forced eviction. ▪ To anticipate and avoid, or where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. ▪ To improve, or restore, the livelihoods and standards of living of displaced persons. ▪ To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.		
Aspects	5.1	▪ Displacement ▪ Physical Displacement ▪ Economic Displacement ▪ Private Sector Responsibilities under Government Managed	PS5 is not applicable to the proposed Tournée 2 Solar PV Facility as no physical or economic displacement or livelihood restoration will be required. The proposed Tournée 2 Solar PV Facility is located on privately owned land that is utilised for agriculture by the landowners. The significance of all potential agricultural

Reference	Requirements		Project Specific Applicability
		Resettlement	impacts is kept low by the very small proportion of the land that is impacted. A Soil, Landuse and Land Capability Assessment has been undertaken and is included in **Appendix H.3**.
Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources			
Overview	Performance Standard 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development.		
Objectives	▪ To protect and conserve biodiversity. ▪ To maintain the benefits from ecosystem services. ▪ To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.		
Aspects	6.1	Protection and Conservation of Biodiversity	A Terrestrial Biodiversity Assessment as well as an Avifauna Assessment, Bats Scoping Survey, and Freshwater Assessment have been included in the proposed scope. The methodologies for the specialist assessments include a combination of literature review, in-field surveys and sensitivity mapping. This substantively complies with the PS 6 general requirements for scoping and baseline assessment for determination of biodiversity and ecosystem services issues. The determination of habitat sensitivity was undertaken within the legal and best practice reference framework for South Africa. The prevalence of invasive alien species will be determined, and mitigation and management measures have been included in the EMPr.
Performance Standard 7: Indigenous People			
Overview	Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded.		
Objectives	▪ To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples. ▪ To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts. ▪ To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. ▪ To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. ▪ To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of		

Reference	Requirements		Project Specific Applicability
	Indigenous Peoples when the circumstances described in this Performance Standard are present. ▪ To respect and preserve the culture, knowledge, and practices of Indigenous Peoples.		
Aspects	7.1	General ▪ Avoidance of Adverse Impacts ▪ Participation and Consent	As per the international instruments under the United Nations (UN) Human Rights Conventions, no indigenous peoples are present within the study area.
	7.2	Circumstances Requiring Free, Prior, and Informed Consent ▪ Impacts on Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use ▪ Critical Cultural Heritage ▪ Relocation of Indigenous Peoples from Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use	
	7.3	Mitigation and Development Benefits	
	7.4	Private Sector Responsibilities Where Government is Responsible for Managing Indigenous Peoples Issues	
Performance Standard 8: Cultural Heritage			
Overview	Performance Standard 8 recognizes the importance of cultural heritage for current and future generations.		
Objectives	▪ To protect cultural heritage from the adverse impacts of project activities and support its preservation. ▪ To promote the equitable sharing of benefits from the use of cultural heritage.		
Aspects	8.1	Protection of Cultural Heritage in Project Design and Execution	A Heritage Assessment (**Appendix H.8**) has been carried out by a suitably qualified specialist. A Chance Find Procedure is included in the EMPr.

6.4.2 WORLD BANK GROUP ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES

In support of the Performance Standards, the World Bank Group (WBG) has published a number of Environmental Health and Safety (EHS) Guidelines. The EHS Guidelines are technical reference documents that address IFC's expectations regarding the industrial pollution management performance of its projects. They are designed to assist managers and decision makers with relevant industry background and technical information. This information supports actions aimed at avoiding, minimising, and controlling EHS impacts during the construction, operation, and decommissioning phase of a project or facility. The EHS Guidelines serve as a technical reference source to support the implementation of the IFC Performance Standards, particularly in those aspects related to PS3: Pollution Prevention and Abatement, as well as certain aspects of occupational and community health and safety.

Where host country regulations differ from the levels and measures presented in the EHS Guidelines, projects seeking international funding may be expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is required.

The following IFC / WBG EHS Guidelines have been generally consulted during the preparation of the EIA in order to aid the identification of EHS aspects applicable to the project:

- Electric Power Transmission and Distribution (2007) - information relevant to power transmission between a generation facility and a substation located within an electricity grid, in addition to power distribution from a substation to consumers located in residential, commercial, and industrial areas
- General EHS Guidelines – this includes a section on a range of environmental, occupational health and safety, community health and safety, and construction activities that would apply to the project. The guideline also contains recommended guidelines adopted form the World Health Organisation (WHO) for ambient air and water quality, which are referred to in the relevant impact assessment sections in the EIA report.

6.4.3 EQUATOR PRINCIPALS

The Equator Principles (EPs) is a risk management framework, adopted by financial institutions, for determining, assessing, and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making.

The EPs apply globally to all industry sectors and to five financial products 1) Project Finance Advisory Services, 2) Project Finance, 3) Project-Related Corporate Loans, 4) Bridge Loans and 5) Project-Related Refinance and Project-Related Acquisition Finance. The relevant thresholds and criteria for application is described in detail in the Scope section of the EP. Currently 125 Equator Principles Financial Institutions (EPFIs) in 37 countries have officially adopted the EPs, covering the majority of international project finance debt within developed and emerging markets. EPFIs commit to implementing the EPs in their internal environmental and social policies, procedures and standards for financing projects and will not provide Project Finance or Project-Related Corporate Loans to projects where the client will not, or is unable to, comply with the EPs.

While the EPs are not intended to be applied retroactively, EPFIs apply them to the expansion or upgrade of an existing project where changes in scale or scope may create significant environmental and social risks and impacts, or significantly change the nature or degree of an existing impact. The EPs have greatly increased the attention and focus on social/community standards and responsibility, including robust standards for indigenous peoples, labour standards, and consultation with locally affected communities within the Project Finance market.

The EPs have also helped spur the development of other responsible environmental and social management practices in the financial sector and banking industry and have supported member banks in developing their own Environmental and Social Risk Management Systems.

The requirements and applicability of the EPs are outlined in **Table 6-6**.

It should be noted that Principles 8 and 10 relate to a borrower's code of conduct and are therefore not considered relevant to the S&EIA process and have not been included in this discussion.

Table 6-6 - Requirements and Applicability of the Equator Principles

Requirement		Project Specific Applicability
Principle 1: Review and Categorisation		
Overview	When a project is proposed for financing, the EPFI will, as part of its internal social and environmental review and due diligence, categorise such project based on the magnitude of its potential impacts and risks in accordance with the environmental and social screening criteria of the IFC. Using categorisation, the EPFI's environmental and social due diligence is commensurate with the nature, scale, and stage of the Project, and with the level of environmental and social risks and impacts. The categories are: ▪ Category A: Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented; ▪ Category B: Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and ▪ Category C: Projects with minimal or no adverse environmental and social risks and/or impacts.	Based upon the significance and scale of the Project's environmental and social impacts, the proposed project is regarded as a Category B project i.e., a project with potential limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.
Principle 2: Environmental and Social Assessment		
Overview	For all Category A and Category B Projects, the EPFI will require the client to conduct an appropriate Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and scale of impacts of the proposed Project (which may include the illustrative list of issues found in Exhibit II). The Assessment Documentation should propose measures to minimise, mitigate, and where residual impacts remain, to compensate/offset/remedy for risks and	This document is the second deliverable (i.e. Draft EIA Report) from the S&EIA process undertaken for the proposed Project. The impact assessment comprehensively assesses the key environmental and social impacts and complies with the

Requirement		Project Specific Applicability
	impacts to Workers, Affected Communities, and the environment, in a manner relevant and appropriate to the nature and scale of the proposed Project. The Assessment Documentation will be an adequate, accurate and objective evaluation and presentation of the environmental and social risks and impacts, whether prepared by the client, consultants or external experts. For Category A, and as appropriate, Category B Projects, the Assessment Documentation includes an Environmental and Social Impact Assessment (ESIA). One or more specialised studies may also need to be undertaken. For other Category B and potentially C Projects, a limited or focused environmental or social assessment may be appropriate, applying applicable risk management standards relevant to the risks or impacts identified during the categorisation process.	requirements of the South African EIA Regulations. In addition, an EMPr has also been compiled.
Principle 3: Applicable Environmental and Social Standards		
Overview	The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues. The EPFI's due diligence will include, for all Category A and Category B Projects globally, review and confirmation by the EPFI of how the Project and transaction meet each of the Principles. For Projects located in Non-Designated Countries, the Assessment process evaluates compliance with the then applicable IFC PS and WBG EHS Guidelines. For Projects located in Designated Countries, compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues.	As South Africa has been identified as a non-designated country, the reference framework for environmental and social assessment is based on the IFC PS. In addition, this S&EIA process has been undertaken in accordance with NEMA (the host country's relevant legislation).
Principle 4: Environmental and Social Management System and Equator Principles Action Plan		
Overview	For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the assessment process and incorporate actions required to comply with the applicable standards. Where the applicable standards are not met to the EPFI's satisfaction, the client and the EPFI will agree on an Equator Principles Action Plan (EPAP). The EPAP is intended to outline gaps and commitments to meet EPFI requirements in line with the applicable standards.	A formal project specific ESMS will be compiled in the event that the project is developed in the future. Management and monitoring plans outlines in the EMPr will serve as the basis for an ESMS for the proposed Project.

Requirement		Project Specific Applicability
Principle 5: Stakeholder Engagement		
Overview	EPFI will require the client to demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with Affected Communities Workers and, where relevant, Other Stakeholders. For Projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation process. To accomplish this, the appropriate assessment documentation, or non-technical summaries thereof, will be made available to the public by the borrower for a reasonable minimum period in the relevant local language and in a culturally appropriate manner. The borrower will take account of and document the process and results of the consultation, including any actions agreed resulting from the consultation. Disclosure of environmental or social risks and adverse impacts should occur early in the Assessment process, in any event before the Project construction commences, and on an ongoing basis.	The S&EIA process includes an extensive stakeholder engagement process which complies with the South African EIA Regulations. The process includes consultations with local communities, nearby businesses, and a range of government sector stakeholders (state owned enterprises, national, provincial and local departments). The stakeholder engagement process solicits interest from potentially interested parties through the placement of site notices and newspaper advertisements as well as written and telephonic communication. The stakeholder engagement process is detailed in **Section 3.5**.
Principle 6: Grievance Mechanism		
Overview	For all Category A and, as appropriate, Category B Projects, the EPFI will require the client, as part of the ESMS, to establish effective grievance mechanisms which are designed for use by Affected Communities and Workers, as appropriate, to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance. The borrower will inform the Affected Communities and Workers about the grievance mechanism in the course of the stakeholder engagement process and ensure that the mechanism addresses concerns promptly and transparently, in a culturally appropriate manner, and is readily accessible, at no cost, and without retribution to the party that originates the issue or concern.	The EMPr include a Grievance Mechanism Process for Public Complaints and Issues. This procedure effectively allows for external communications with members of the public to be undertaken in a transparent and structured manner.
Principle 7: Independent Review		
Overview	For all Category A and, as appropriate, Category B Projects, an Independent Environmental and Social Consultant, not directly associated with the client, will carry out an Independent Review of the Assessment Documentation including the ESMPs, the ESMS, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence, and assess Equator Principles	This principle will only become applicable in the event that the project is developed in the future.

Requirement		Project Specific Applicability
	compliance.	
Principle 9: Independent Monitoring and Reporting		
Overview	To assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting for all Category A, and as appropriate, Category B projects. Monitoring and reporting should be provided by an Independent Environmental and Social Consultant; alternatively, the EPFI will require that the client retain qualified and experienced external experts to verify its monitoring information, which will be shared with the EPFI in accordance with the frequency required.	This principle will only become applicable in the event that the project is developed in the future.

6.5 OTHER GUIDELINES AND BEST PRACTICE RECOMMENDATIONS

6.5.1 GENERIC EMPR RELEVANT TO AN APPLICATION FOR SUBSTATION AND OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

NEMA requires that an EMPr be submitted where an EIA has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation. The content of an EMPr must either contain the information set out in Appendix 4 of the EIA Regulations, 2014, as amended, or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice, that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the CA.

GN 435 of 22 March 2019 identified a generic EMPr relevant to applications for substations and overhead electricity transmission and distribution infrastructure which require authorisation in terms of Section 42(2) of NEMA. Applications for overhead electricity transmission and distribution infrastructure that trigger Activity 11 of Listing Notice 1 or Activity 9 of Listing Notice 2 and any other listed or specified activities must use the generic EMPr.

The objective of the generic EMPr is "*to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature*."

The generic EMPrs for Substations and powerlines have been included in the Site-Specific EMPr (**Appendix I**).

6.6 ADDITIONAL PERMITS AND AUTHORISATIONS

Table 6-7 outlines the additional permits and authorisations required for the proposed development, as well as the relevant Competent Authorities responsible.

Table 6-7 – Additional Permits and Authorisations required for the proposed development

Permits / Authorisation	Legislation	Relevant Authority	Status
Notification Of Intent To Develop (NID) Section 38 (1) and Section 38 (8)	Section 38 (1) & (8) of the NHRA	SAHRA	In Process
Subdivision of Agricultural Land Act (SALA) Consent / Change of Land Use (re-zoning)	Subdivision of Agricultural Land Act (Act No. 70 of 1970) / Spatial Planning and Land Use Management Act (Act No. 16 of 2013) (SPLUMA)	DALRRD	Given that the project is proposed on land zoned for Agriculture, SALA requires that any long-term lease associated with the renewable energy facility be approved by the DALRRD. Subdivision and consolidation of land are also regulated as part of municipal planning, and will therefore be subject to municipal by-laws and provincial legislation. The SALA consent and Land use zoning are separate processes from the Application for EA, and needs to be applied for and obtained separately from the EA and S&EIR process. It is however noted that a rezoning application is already underway for the proposed project, however, can only be complete once the EA is issued. The proponent will ensure all municipal approvals and zoning requirements are met prior to commencement of construction.
Water Use Licence / General	National Water Act (Act No. 36 of 1998)	Department of Water and Sanitation	An application for water use authorisation is currently underway for this project.
Obstacle Permit	Civil Aviation Act (Act 13 of 2009)	Air Traffic and Navigation Services / Civil Aviation Authority	Conditional Approval will be required for the PV facility prior to construction.
Section 53 Approval	Minerals and Petroleum Resources Development Act (No. 28 of 2002)	Department of Mineral Resources and Energy	Approval will be required prior to construction.
Permits for removal or destruction of Threatened or Protected Species (TOPs)	National Environmental Management Biodiversity Act	DFFE	Permits will be obtained prior to the commencement of construction if applicable.

7 BASELINE ENVIRONMENT

The following chapter presents an overview of the biophysical and socio-economic environment in which the proposed Project is located. It is important to gain an understanding of the Project area and its surroundings, as it will provide for a better understanding of the receiving environment in which the Project is being considered.

The description of the baseline environment is essential in that it represents the conditions of the environment before the construction of the proposed Project (i.e., the current, or status quo, environment) against which environmental impacts of the proposed Project can be assessed and future changes monitored.

The area has previously been studied to some extent and is recorded in various sources. Consequently, some components of the baseline have been generated based on literature review. However, where appropriate, baseline information has been supplemented or generated by specialists appointed to undertake baseline and impact assessments for the proposed Project.

7.1 PHYSICAL ENVIRONMENT

7.1.1 AGRICULTURAL POTENTIAL

*The following is extracted from the Soil, Landuse and Land Capability Assessment by Zimpande Research Collaborative (ZRC) and included as **Appendix H.1**.*

7.1.1.1 Current Land Use

According to observations made during the site assessment the Tournée 2 Solar PV Facility largely comprises grazing land as well as cultivated field with maize and soybeans as the crops of choice. The Tournée 2 Solar PV Facility is traversed by watercourses which comprises instream dams as well other artificial impoundments in the immediate vicinity of these watercourses. The surroundings are characterised by cultivated lands as well as the Tutuka Power Station and ash dam located south of the Tournée 2 Solar PV Facility. **Figure 7-1** below depicts the associated land use within the study area.

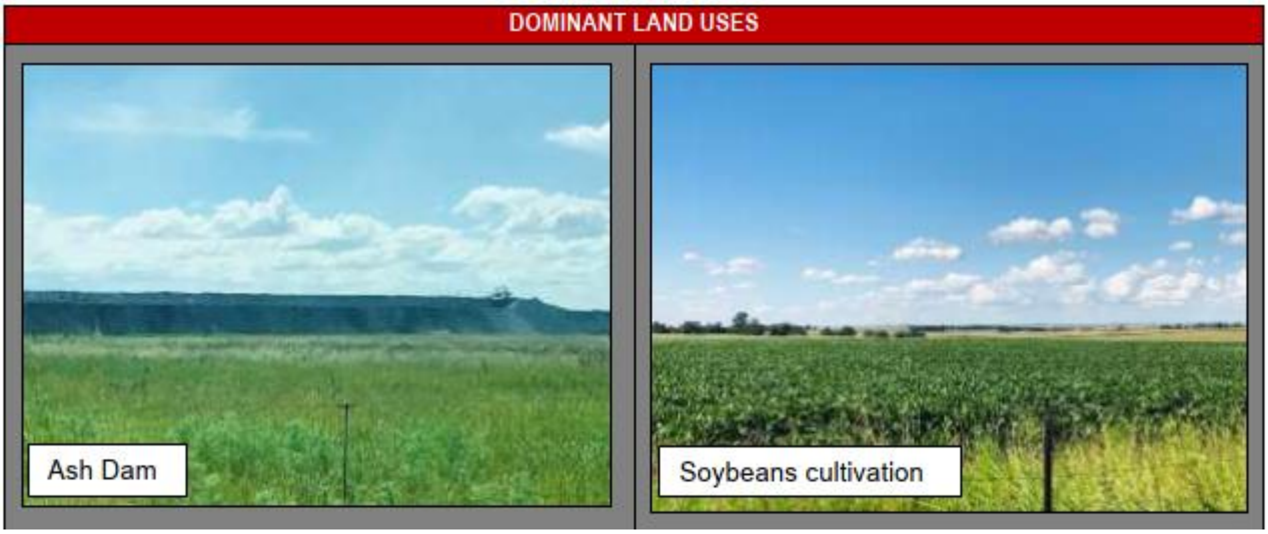


Figure 7-1 - Land uses associated with the Tournée 2 Solar PV Facility

Source: ZRC, 2023

7.1.1.1 Dominant Soil Forms

The catena of the landscape in which the wetland is situated largely resembles a Vertic and Melanic topo sequence where the soils are characterised by black coloured, strongly to very strongly structured (topsoil and subsoil) of varying depths. These soils have high clay content, displaying a high water-holding capacity and mostly containing a high percentage of swelling clay minerals.

Vertic and Melanic soils associated with the study area can be classified as Arcadia, Rustenburg and Rensburg soil forms, where the Vertic/Melanic A horizon grades directly into a Hard Rock material (Milkwood/Mayo) or a Gleyed horizon which indicates signs of prolonged saturation. These soils can also be moderately deep where the Vertic/Melanic grades into a pedocutanic horizon, underlain by gleyed material. These soils are generally restricted to intensive grazing and wildlife.

The portions to the east are characterised by Darnall/Bonheim soil forms which are also of melanic (dark clayey) character underlined by pedocutanic horizons as well as lithic/hard rock material. Although these soils resemble the Milkwood/Mayo soils these soils have adequate root depth for most crops and can be cultivated and produce good yield if intensive management practices are implemented.

The remaining portion to the south is comprised of Glencoe soil forms which are characterised by Orthic A horizon, underlain by yellow brown apedal B horizon over hard plinthic material. These are considered arable soils with wetness limitation due to the occurrence of semi-impermeable plinthic material which impedes vertical movement and promotes lateral flows.

The spatial distribution of all identified soil forms within the study area is presented in soil map in **Figure 7-2** below.

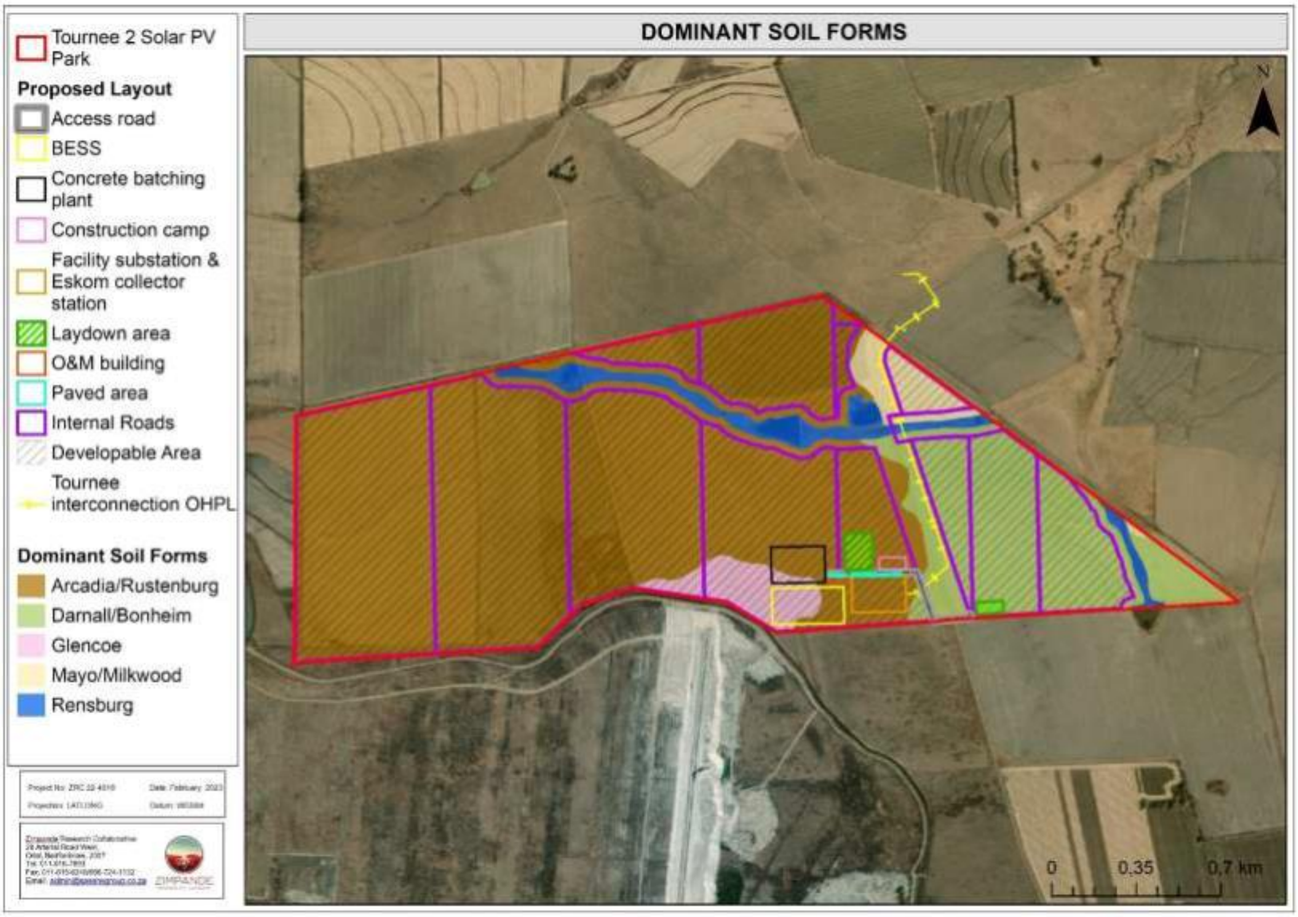


Figure 7-2 - Dominant soil forms associated with the Tournée 2 Solar PV Facility

Source: ZRC, 2023

7.1.1.2 Land Capability Classification

For this assessment, land capability was inferred in consideration of observed limitations to land use due to physical soil properties and prevailing climatic conditions. Climate Capability (measured on a scale of 1 to 8) was therefore considered in the agricultural potential classification. The study area falls into Climate Capability Class 4 due a moderately restricted growing season due to low temperatures and severe frost. Good yield potential for a moderate range of adapted.

The identified soils were classified into land capability and land potential classes using the Camp et. al, and Guy and Smith Classification system (Camp et al., 1987; Guy and Smith, 1998), as presented on **Figure 7-3**; while **Figure 7-4** illustrates the Land Potential associated with the study area when incorporating other factors such as climate, slope and soil conditions together. **Table 7-1** below presents the dominant soil forms and their respective land capability, agricultural potential as well as areal extent expressed as hectares as well as percentages.

Table 7-1 – Land capability and land potential associated with the soils occurring within the study area

Soil Form	Land Capability	Land Potential	Area (ha)	Percentage (%)
Darmall/Bonheim	Arable (Class IV)	Moderate Potential (L4)	70.4	21.3
Glencoe				
Rensburg	Watercourse (Class V)	Watercourse (L4)	13.5	4.1
Arcadia	Grazing (Class VI)	Restricted Potential (L5)	246.3	74.6
Mayo/Milkwood				
Total Enclosed			**330.2**	**100**

Source: ZRC, 2023

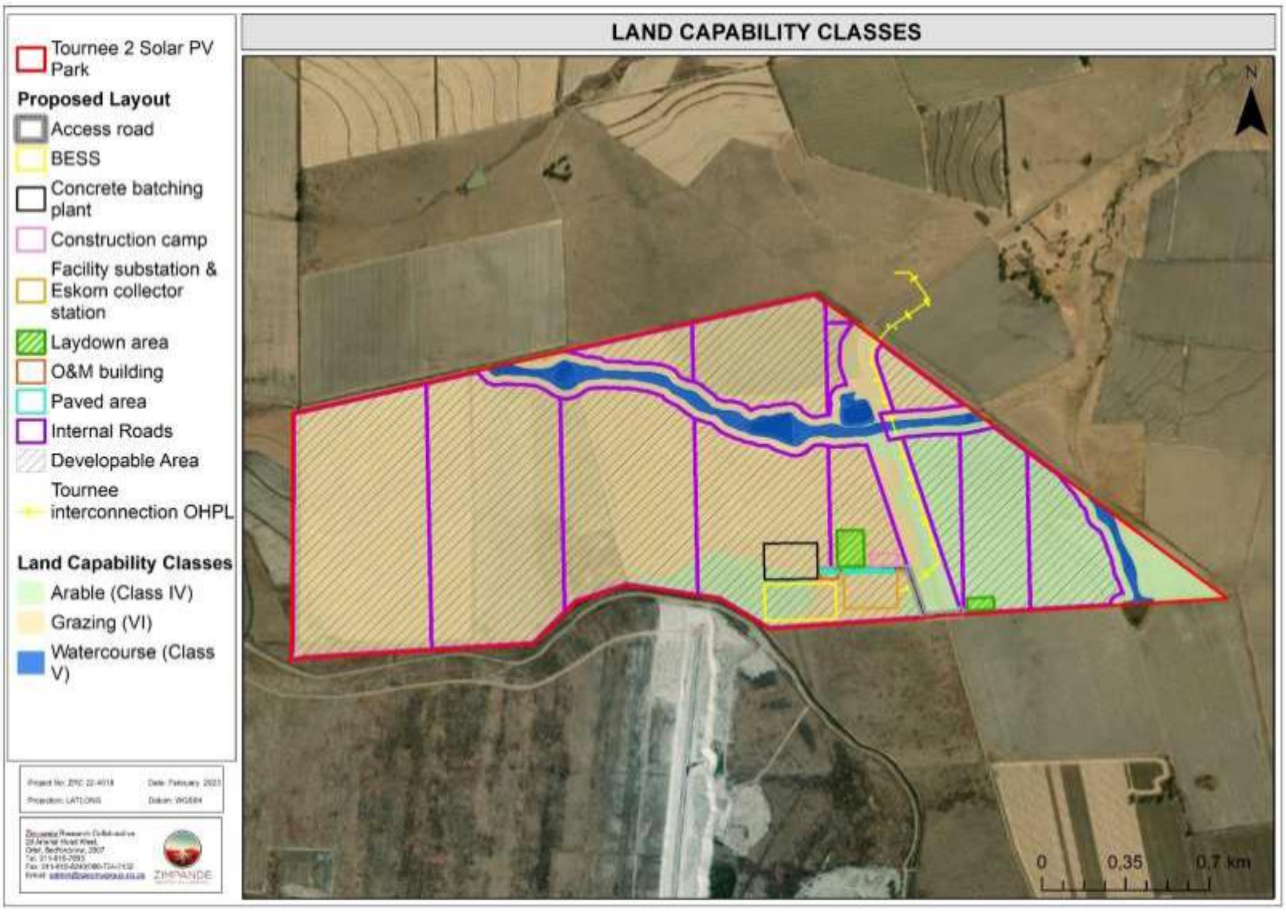


Figure 7-3 – Land Capability of the soil forms associated with the Tournée 2 Solar PV Facility

Source: ZRC, 2023

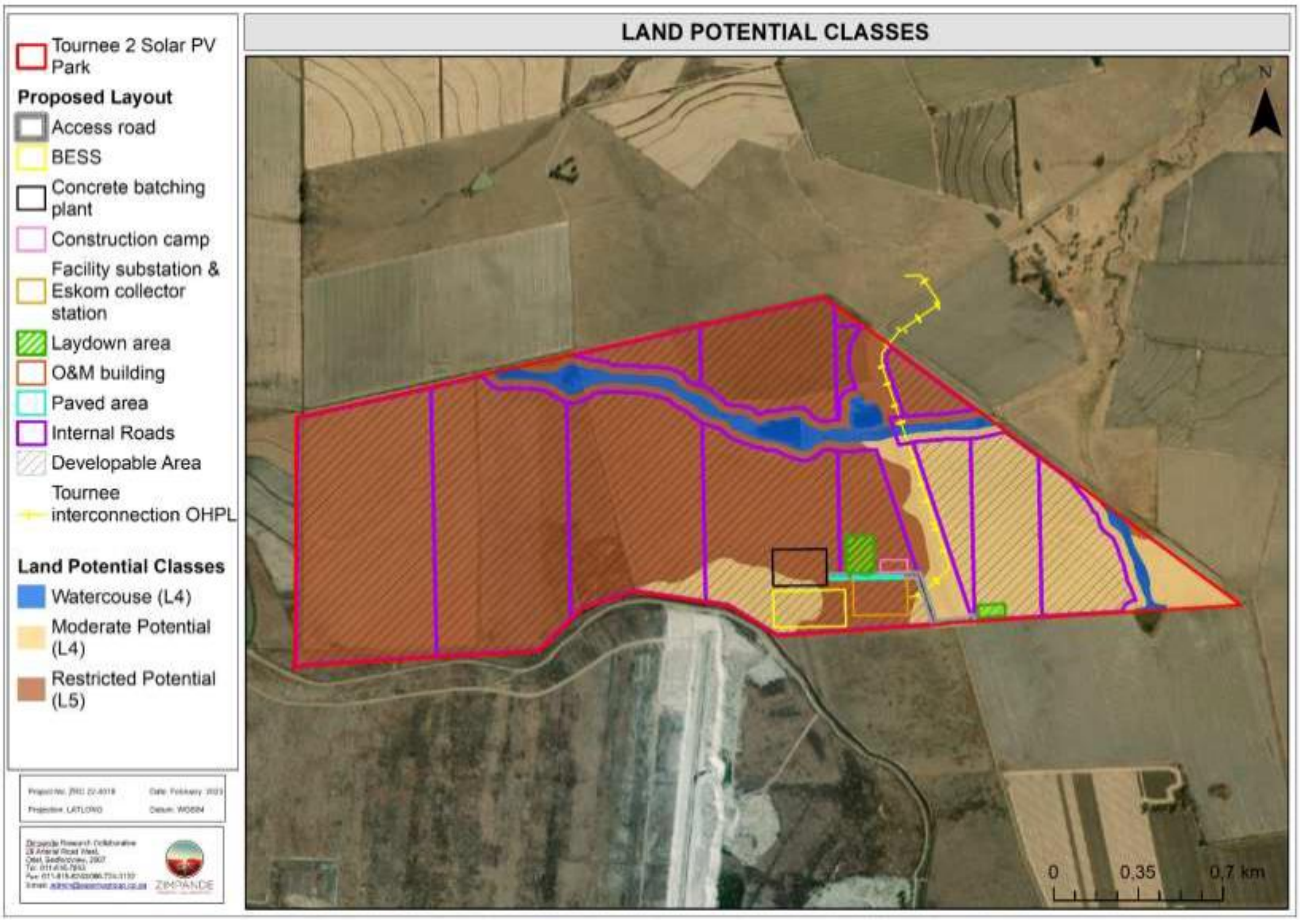


Figure 7-4 – Land potential associated with the Tournée 2 Solar PV Facility

Source: ZRC, 2023

7.1.2 TOPOGRAPHY

The proposed Solar PV plant is located approximately 27.7km north-east of Standerton in the Mpumalanga Province. The site can be accessed via the R38 and R39. The site lies within the C11H quaternary catchment as shown in **Figure 7-5.** The highest rainfall and temperature occur during the month of December. The site is relatively flat with an elevation ranging between 1612mabsl and 1651mabsl and the overall slope gradient is less than 3%.

Figure 7-5 – Quaternary catchment and surface water across the site

7.1.3 GEOLOGICAL CONTEXT

The following is extracted from the Desktop Geotechnical Impact Assessment by WSP ***(Appendix H.12***

The site lies in the north-eastern part of the Karoo basin where the lower Karoo Supergroup strata are exposed (**Figure 7-6** and **Figure 7-7**). Along the rivers and streams much younger reworked sands and alluvium overly the older strata.

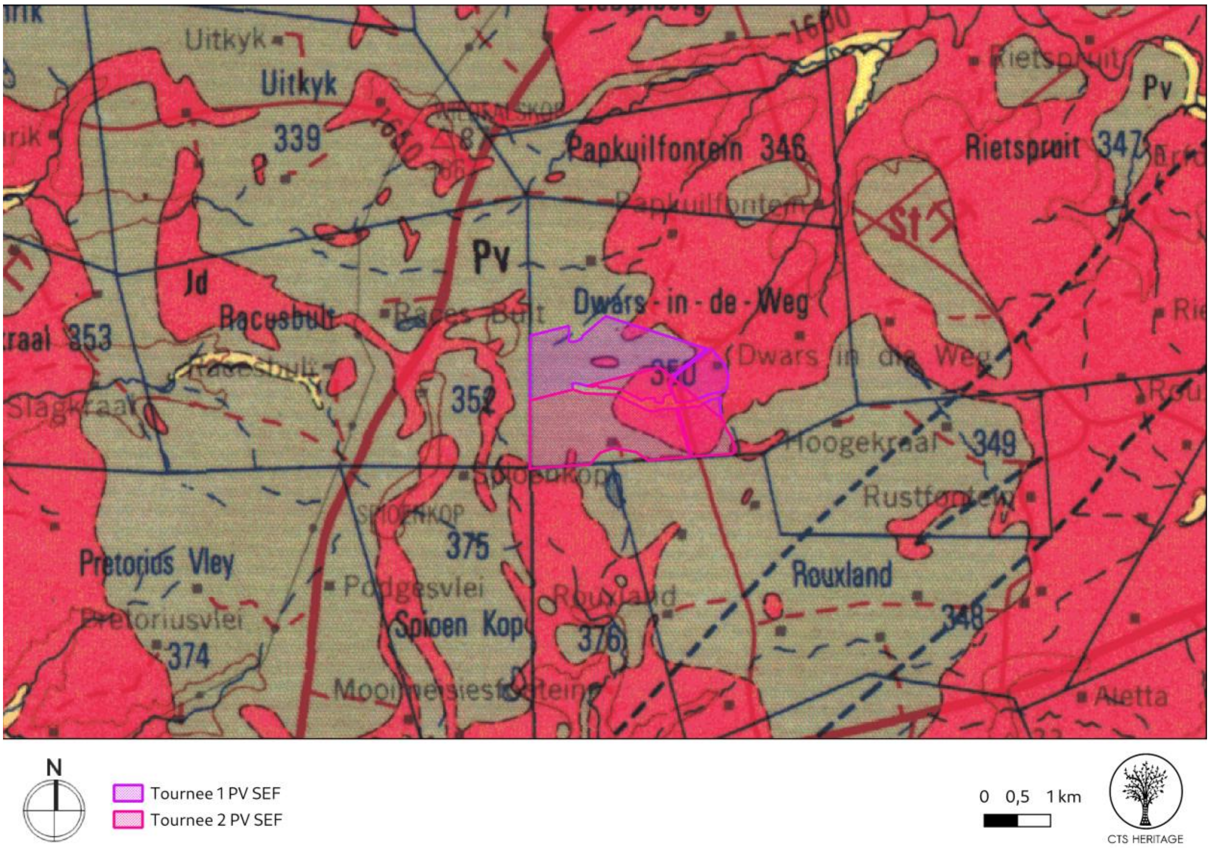


Figure 7-6 - Geological map of the area around Farm Dwars-in-de-Weg 350 for the Tournée PV SEFs

Source: Map enlarged from the Geological Survey 1: 250 000 map 2628 East Rand

Table 7-2 - Explanation of symbols for the geological map and approximate ages

Symbol	Group / Formation	Lithology	Approximate Age
Qc	Quaternary	Alluvium, sand, calcrete	Neogene, ca 2.5 Ma to present
Jd	Jurassic dykes	Dolerite dykes, intrusive	Jurassic, Ca 183 Ma
Pv	Vryheid Fm, Ecca Group, Karoo SG	Shales, mudstone, sandstone, coal seams	Early Permian Ca 290-270 Ma

Source: Johnson et al., 2006; Partridge et al., 2006

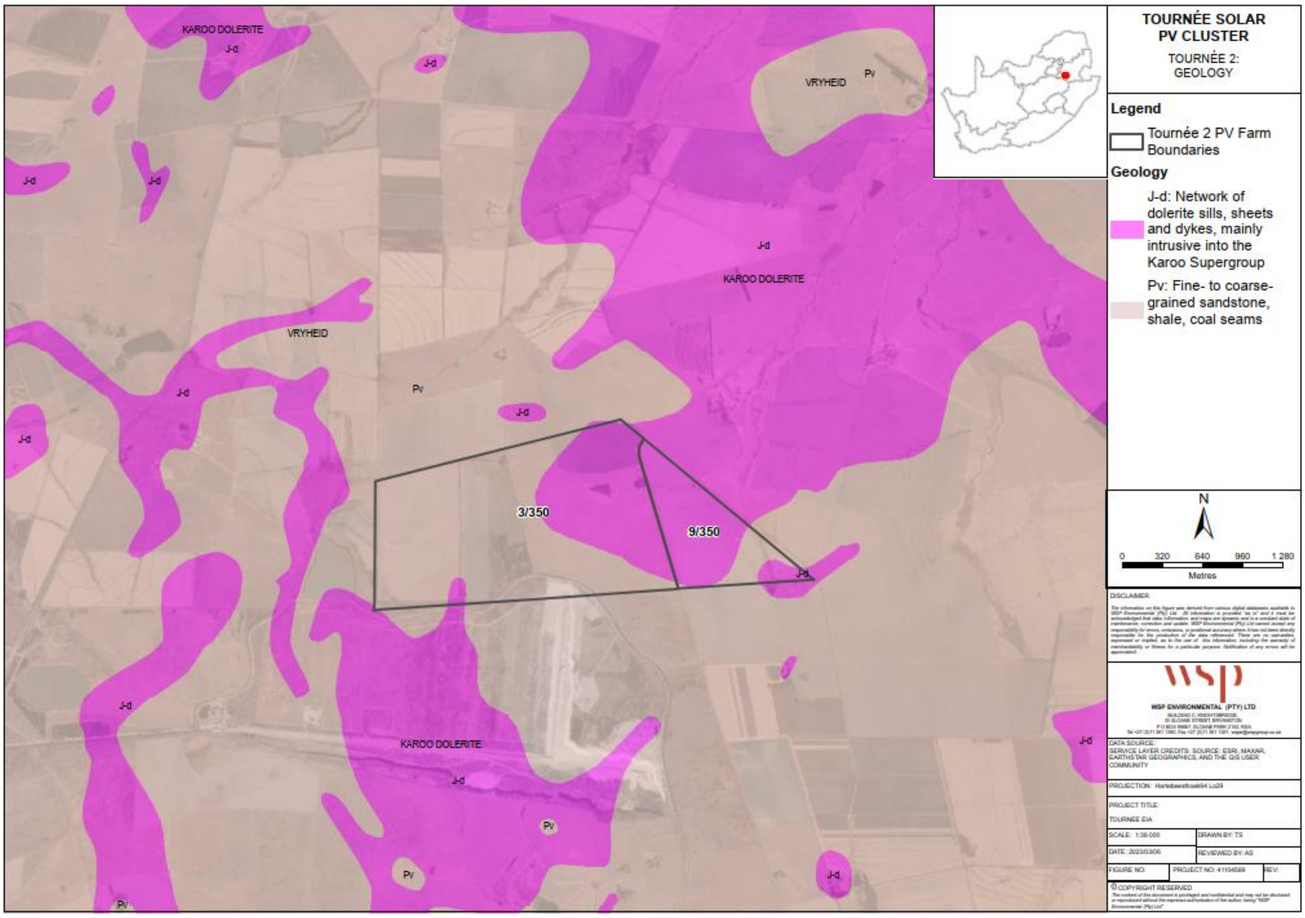


Figure 7-7 - Geological map of Tournée 2 Solar PV Facility

The Karoo Supergroup rocks cover a very large proportion of South Africa and extend from the northeast (east of Pretoria) to the southwest and across to almost the KwaZulu Natal south coast. It is bounded along the southern margin by the Cape Fold Belt and along the northern margin by the much older Transvaal Supergroup rocks. Representing some 120 million years (300 – 183Ma), the Karoo Supergroup rocks have preserved a diversity of fossil plants, insects, vertebrates and invertebrates.

During the Carboniferous Period South Africa was part of the huge continental landmass known as Gondwanaland and it was positioned over the South Pole. As a result, there were several ice sheets that formed and melted, and covered most of South Africa (Visser, 1986, 1989; Isbell et al., 2012). Gradual melting of the ice as the continental mass moved northwards and the earth warmed, formed fine-grained sediments in the large inland sea. These are the oldest rocks in the system and are exposed around the outer part of the ancient Karoo Basin, and are known as the Dwyka Group. They comprise tillites, diamictites, mudstones, siltstones and sandstones that were deposited as the basin filled. This group has been divided into two formations with Elandsvlei Formation occurring throughout the basin and the upper Mbizane Formation occurring only in the Free State and KwaZulu Natal (Johnson et al., 2006).

Overlying the Dwyka Group rocks are rocks of the Ecca Group that are Early Permian in age. There are eleven formations recognised in this group but they do not all extend throughout the Karoo Basin. In Mpumalanga, the Free State and KwaZulu Natal, from the base upwards are the

Pietermaritzburg Formation, Vryheid Formation and the Volksrust Formation. All of these sediments have varying proportions of sandstones, mudstones, shales and siltstones and represent shallow to deep water settings, deltas, rivers, streams and overbank depositional environments.

Large exposures of Jurassic dolerite dykes occur throughout the area. These intruded through the Karoo sediments around 183 million years ago at about the same time as the Drakensberg basaltic eruption.

7.1.4 SURFACE DRAINAGE

Flooding affects flat lying areas, areas confined to drained channels and flood plains. The Tournée 2 PV site is located on a relatively flat area and ponding of water is a possibility, during wet periods, especially in areas where shallow rock or clay is present in the profile. Water management is recommended across all flat areas to facilitate water run-off and to alleviate the possibility of standing water at the foundation positions.

7.1.5 EROSION

The slope on site, as well as the soil structure will influence the amount of erosion. The low site gradient makes the probability of erosion unlikely. The site is covered in grassland, tall grass and crops, the presence of which reduces the risk of erosion. Erosion, however, may occur following the disturbance of the natural vegetation during construction of the facility. Issues relating to erosion must be mitigated, by revegetation after construction.

7.1.6 SLOPE STABILITY

Development on the site is unlikely to cause any slope instability as no significant cut slopes will be developed. Where excavations are required, up to a depth of 3m, excavations should be excavated at a batter of 1:1 in soil where no water or seepage is evident and to 1:2, or flatter, where water is encountered. Rock can be excavated at a batter of 1:0.5 or vertically in the temporary case up to a depth of 3m.

7.1.7 SOLAR PANEL AND ASSOCIATED INFRASTUCTURE FOUNDATIONS

The solar panels and the associated infrastructure will exert a static load on the founding material and competent material is required for founding to ensure sufficient bearing capacity and strength. Where these structures are underlain by dolerite rock and Vryheid sandstone, rock may be present at a relatively shallow depth and founding on rock may be possible. Where the structures are underlain by weathered dolerite, the residual profile may be more thickly developed with rock expected at a depth of, generally, more than 3m.

Test pits should be excavated at the foundation positions during the detailed geotechnical investigation prior to construction to determine the depth to rock, the composition and consistency of the material within the soil profile and the strength characteristics thereof.

Some of the proposed associated structures may straddle different rock types and, hence, soil profiles. It should be noted that structures that span different profiles can be subject to differential movement such as differential settlement. If a structure spans different profiles the easiest remedial action is to move the structure.

7.2 BIOLOGICAL ENVIRONMENT

7.2.1 AQUATIC BIODIVERSITY

The following is extracted from the Freshwater Assessment compiled by Scientific Aquatic Services (Pty) Ltd (SAS) and included as ***Appendix H.4.***

The Tournée 2 Solar PV Facility and investigation areas fall within the Upstream Catchment Management (FEPA CODE 4) area. Upstream Management Areas (4) are sub-quaternary catchments in which human activities need to be managed to prevent the degradation of downstream river FEPAs and Fish Support Areas. Upstream Management Areas do not include management areas for wetland FEPAs, which need to be determined at a finer scale.

According to the NFEPA (2011) database, six (6) seep wetlands, a depression wetland, and two (2)wetland flats are indicated within the proposed Tournée 2 Solar PV Facility and associated investigation area. The seep wetlands east of the proposed Tournée 2 Solar PV Facility and the depression wetland are indicated to be in a moderately modified (WETCON C) ecological condition. The remaining seeps and the 2 flat wetlands are indicated to be in a heavily to critically modified (WETCON Z1-Z3) ecological condition. Z1 wetlands overlap with an artificial waterbody, Z2 wetlands are majority artificial, and Z3 wetlands have <25% natural land cover.

According to the NFEPA (2011) database, no rivers are indicated to be associated with the proposed Tournée 2 Solar PV Facility. An unnamed tributary of the Vaal River is indicated within the investigation area. The tributary is indicated to be not intact (River Condition Class Z).

The proposed Tournée 2 Solar PV Facility and investigation areas fall within the Mesic Highveld Grassland Group 3 wetland vegetation type (Wetveg). This vegetation type is considered to be least threatened (LT) according to Mbona et al. (2015).

According to the NBA database (2018), two (2) seep wetlands, one (1) Channelled Valley Bottom (CVB) wetland, and one (1) depression wetland are indicated to be within the proposed Tournée 2 Solar PV Facility and the associated investigation area. The seep wetlands are indicated to be in a moderately modified (Wetland Condition Class C) ecological condition. The CVB wetland is indicated to be in a largely to critically modified (WETCON D/E/F) ecological condition. Lastly, the depression wetland is indicated to be in a natural to near natural (WETCON A/B) ecological condition. The artificial wetlands database indicates the presence of six (6) dams within the proposed Tournée 2 Solar PV Facility and associated investigation area, three (3) of which occur within the CVB and seep wetlands. No rivers are indicated within the proposed Tournée 2 Solar PV Facility, however, an Unnamed Tributary of the Vaal River is indicated to be within the investigation area. The tributary is indicated to be in a largely to critically modified ecological condition (RIVERCON Class D/F).

According to the MPHW (2014) database, a large seep wetland, and a channelled valley bottom wetland are indicated to be within the proposed Tournée 2 Solar PV Park. These are also indicated in the investigation area, along with several dams. The seep wetland is indicated by the database to be in a moderately modified ecological condition (WETCON C) and the channelled valley bottom to be in a natural/near natural ecological condition (WETCON A/B).

7.2.1.1 Freshwater Ecosystem Characterisation

The site assessment confirmed the presence of a Channelled Valley Bottom (CVB) wetland and depression wetland associated with the proposed Tournée 2 Solar PV Facility and associated investigation area.

The identified CVB wetland within the proposed Tournée 2 Solar PV Facility and investigation areas was classified according to the Classification System (Ollis et al., 2013) as an Inland System. The wetland falls within the Highveld Aquatic Ecoregion and within the Mesic Highveld Grassland Group 3 wetland vegetation (wetveg) group considered Least Threatened according to Mbona et al. (2014). At Levels 3 (Landscape Unit) and 4 (HGM Type) of the Classification System, the system was classified as per the summary in **Table 7-3**, below.

Table 7-3 - Characterisation at Levels 3 and 4 of the Classification System (Ollis et al., 2013) of the freshwater ecosystems associated with the study and investigation areas

Freshwater Ecosystems	Level 3: Landscape unit	Level 4: HGM Type
CVB wetland located within the eastern/southern portions of the proposed Tournée 2 Solar PV Facility and investigation areas.	Plain: an extensive area of low relief characterised by relatively level, gently undulating or uniformly sloping land.	CVB: a valley-bottom wetland with a river channel running through it.
Depression wetland located in the northern portion of the investigation area.		Depression: a landform with closed elevation contours that increases in depth from the perimeter to a central area of greatest depth, and within which water typically accumulates.

The delineated freshwater ecosystems in relation to the proposed Tournée 2 Solar PV Facility and investigation areas are conceptually depicted in **Figure 7-8** below.

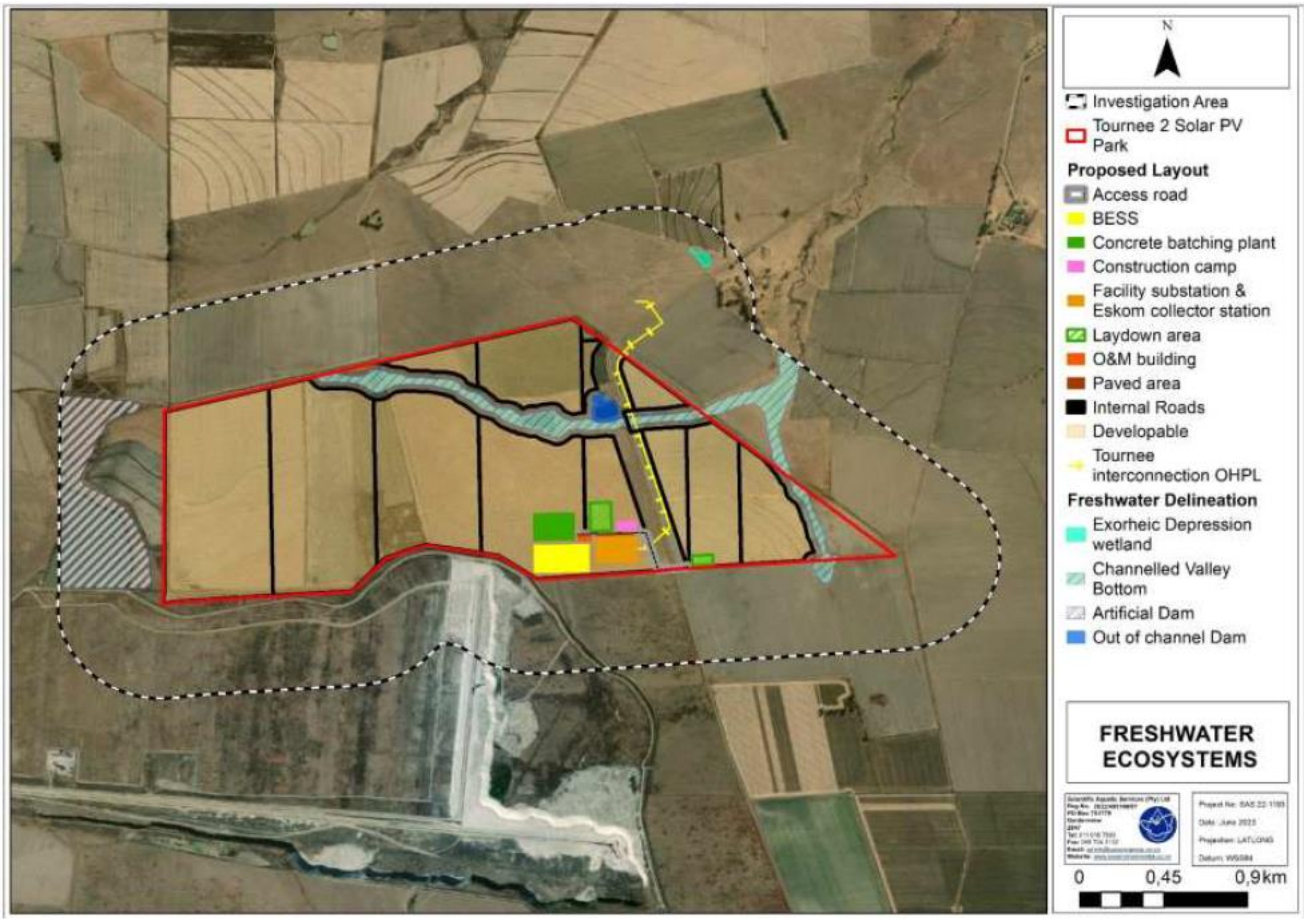


Figure 7-8 - Location of the freshwater ecosystems associated with the proposed Tournée 2 Solar PV Facility and investigation area

Source: SAS, 2023

7.2.1.2 Freshwater Ecosystem Delineation

CVB wetlands

The CVB wetlands have a moderate to very low ecoservice provision, with the primary ecoservice provisioning attributed to provisioning services such as food for livestock and cultivated foods. The low importance of biodiversity maintenance is attributed to the fact that the wetlands are likely to provide a suitable habitat for faunal and floral species (albeit less sensitive) in an area dominated by agricultural activities. The ecological support the wetlands provided are however, deemed important according to the MBSP (2019) database.

The CVB wetlands were assessed to be of moderate Ecological Importance and Sensitivity (EIS) on a landscape scale. The moderate EIS is largely attributed to the fact that the CVB wetlands have been identified by the NBA database (2019) and classified as ESAs (MBSP, 2019). However, the NBA database indicates that the wetlands are in a moderately modified to critically modified ecological condition. As such, although the inherent rating for the wetlands are moderate, the effective EIS is likely to be lower.

The CVB wetlands were assessed to be in a largely modified ecological condition. The primary impacts to the hydrology and geomorphology of the wetlands include infringement of and catchment wide agricultural activities, farm dams and informal road crossings. These activities have resulted in increased runoff due to hardened surfaces and alterations to the natural flow path and flood peaks of the wetlands. The vegetation community of the wetlands have also been altered and is dominated by graminoids, sedges and a few herbaceous species. Agricultural activities and related disturbances have resulted in the encroachment of Alien and Invasive Plants (AIP) and problem weeds within the wetlands.

Based on the PES and EIS of the CVB wetlands, the RMO is to maintain the ecostatus of the wetland systems at a BAS and REC of D (Largely modified). As a result, should any future activities be planned within the delineated boundary of the wetland systems and their catchment, the wetlands and their catchments must be managed to mitigate impacts (in-line with the mitigation hierarchy) to ensure that at a minimum the RMO is achieved.

The hydraulic regime and geomorphological processes of the CVB wetlands have been altered from the natural conditions. Anthropogenic activities such as agricultural activities, road crossings, farm dams and associated hardened surfaces have altered the natural flow path, flood peaks and sediment balance of the wetlands. The road crossings in the eastern/southern CVB wetlands have also influenced the hydraulic connectivity of the wetland and thus negatively affects the hydraulic regime of the wetland.

Although the CVB wetlands are in a largely modified ecological condition, the wetlands still provide a habitat for biota with the dominant vegetation cover comprised of graminoid, sedge and herbaceous species such as *Cyperus congestus, C. esculentus, C. rotundus, Kyllinga erecta var. erecta, Pannicum dilatatum* and *Typha capensis*. Numerous Alien and Invasive Species (AIPs) and problem weeds were also noted within the wetlands which included, but are not limited to, *Conyza bonariensis* (hairy fleabane), *Tagetes minuta* (southern corn marigold), *Bidens pilosa* (black jack), *Oenothera rosea* (evening primrose), *Verbena bonariensis* (purple top vervain) and a few *Salix babylonica* (weeping willow) individuals. Overall, the CVB wetlands are considered likely to provide roosting, breeding and feeding habitat for avifauna, small mammals, amphibians, reptiles and invertebrate, albeit less sensitive species.

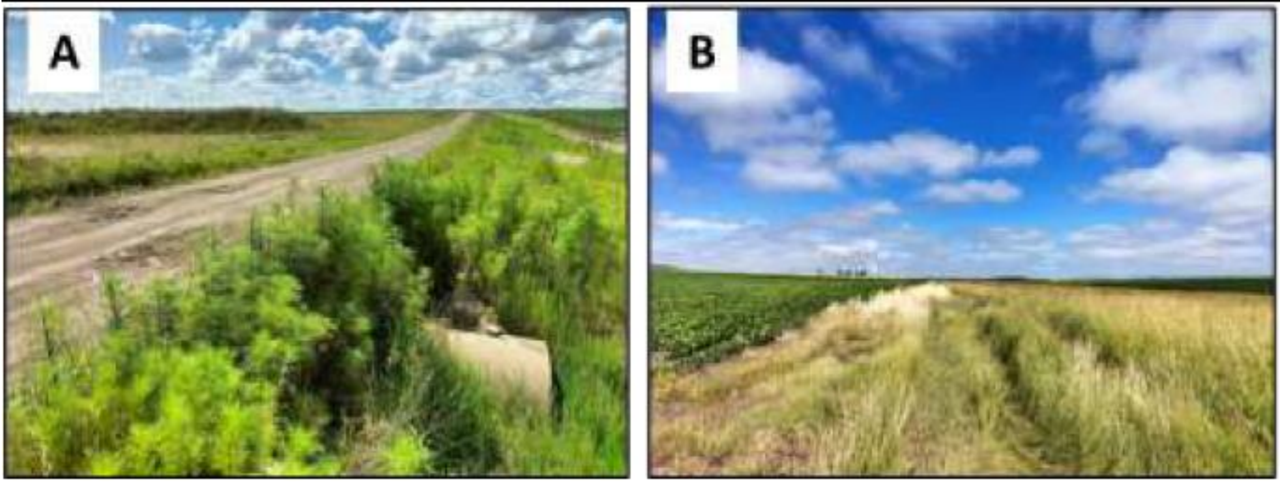


Figure 7-9 – Photographic representation of the impacts identified within the eastern/southern CVB wetland. (A) an informal road bisects the CVB wetland. (B) Agricultural activities such as cultivation and associated clearing of areas within the delineated extent of the wetland. (C) AIP encroachment as a result of disturbance. (D) Agricultural dam which has been built within the active channel of the wetland

Source: SAS, 2023

7.2.2 TERRESTRIAL BIODIVERSITY

*The following is extracted from the Biodiversity Assessment compiled by Scientific Terrestrial Services (Pty) Ltd (STS) and included as **Appendix H.5.***

7.2.2.1 Vegetation

The Tournée 2 Solar PV Facility is situated within the Grassland Biome and within the Mesic Highveld Grassland Bioregion. The Tournée 2 Solar PV Facility is largely transformed, yet some large sections thereof are identified as being within the remaining extent of the Soweto Highveld Grassland (**Figure 7-10**). This vegetation type is considered Vulnerable (VU) and Not Protected.

Ecosystem types are categorised as “not protected”, “poorly protected”, “moderately protected” and “well protected” based on the proportion of each ecosystem type that occurs within a protected area recognised in the NEMPAA and compared with the biodiversity target for that ecosystem.

The area is categorised by gently to moderately undulating landscape on the Highveld plateau supporting short to medium-high, dense, tufted grassland dominated almost entirely by *Themeda triandra* and accompanied by a variety of other grasses such as *Elionurus muticus, Eragrostis racemosa, Heteropogon contortus* and *Tristachya leucothrix*. In places not disturbed, only scattered small wetlands, narrow stream alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover.

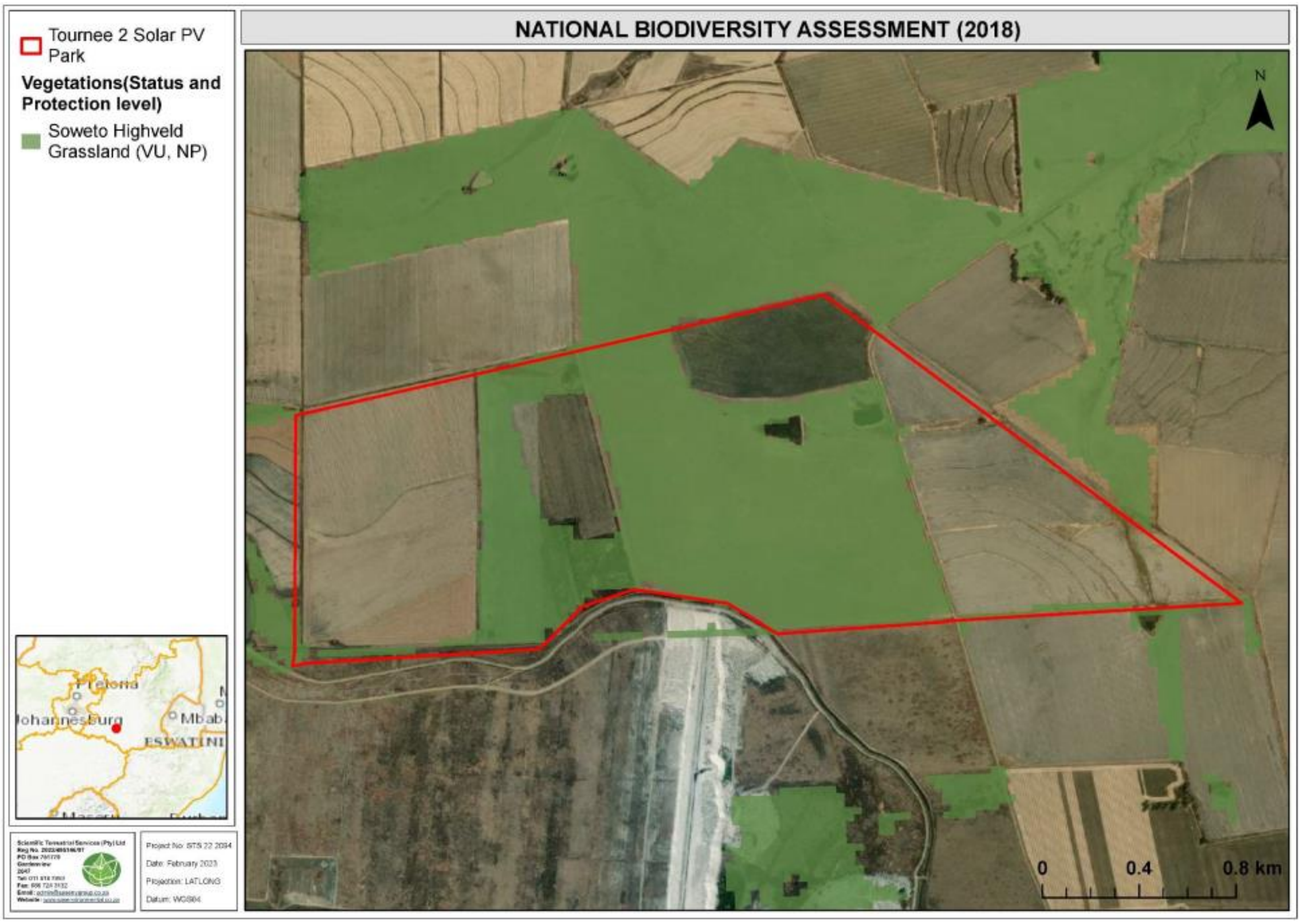


Figure 7-10 – The remaining extent of the vegetation type associated with the Tournée 2 Solar PV Facility according to the National Biodiversity Assessment

Source: STS, 2023

7.2.2.2 Critical Biodiversity Areas

A moderate extent of the Tournée 2 Solar PV Facility is represented by Other Natural Areas (approximately 179.4 ha). These areas are generally located within sections of the Tournée 2 Solar PV Facility that are not cultivated. These are Natural areas which are not identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs), but which provide a range of ecosystem services from their ecological infrastructure.

A very small portion of the proposed Tournée 2 Solar PV Facility is identified as Optimal CBA (approximately 0.33 ha), located in the lower western corner of the proposed Tournée 2 Solar PV Facility. These are areas required to meet targets and with irreplaceability values of more than 80%; Critical linkages or pinch-points in the landscape that must remain natural; and often include Critically Endangered (CR) ecosystems, or hosts species of conservation concern. During the site assessment, the area associated with the CBA was not confirmed to be representative for the targets set for a CBA as these areas were transformed by current cultivation areas. The NPAES (2018) database did not identify any priority focus areas within the Tournée 2 Solar PV Facility, however, is located adjacent to the Tournée 2 Solar PV Facility (on the north western boundary). This however this does not intersect with the distribution of the Tournée 2 Solar PV Facility itself and therefore the proposed development will not impact any NPAES focus areas. The IBA (2015) database did not identify the any IBA within the proposed of the Tournée 2 Solar PV Facility.

The CBA Optimal Areas (**Figure 7-11**) (previously called 'important and necessary' in the Mpumalanga Biodiversity Conservation Plan (MBCP) are the areas optimally located to meet both the various biodiversity targets and other criteria defined in the analysis. Although these areas are not 'irreplaceable' they are the most efficient land configuration to meet all biodiversity targets and design criteria.

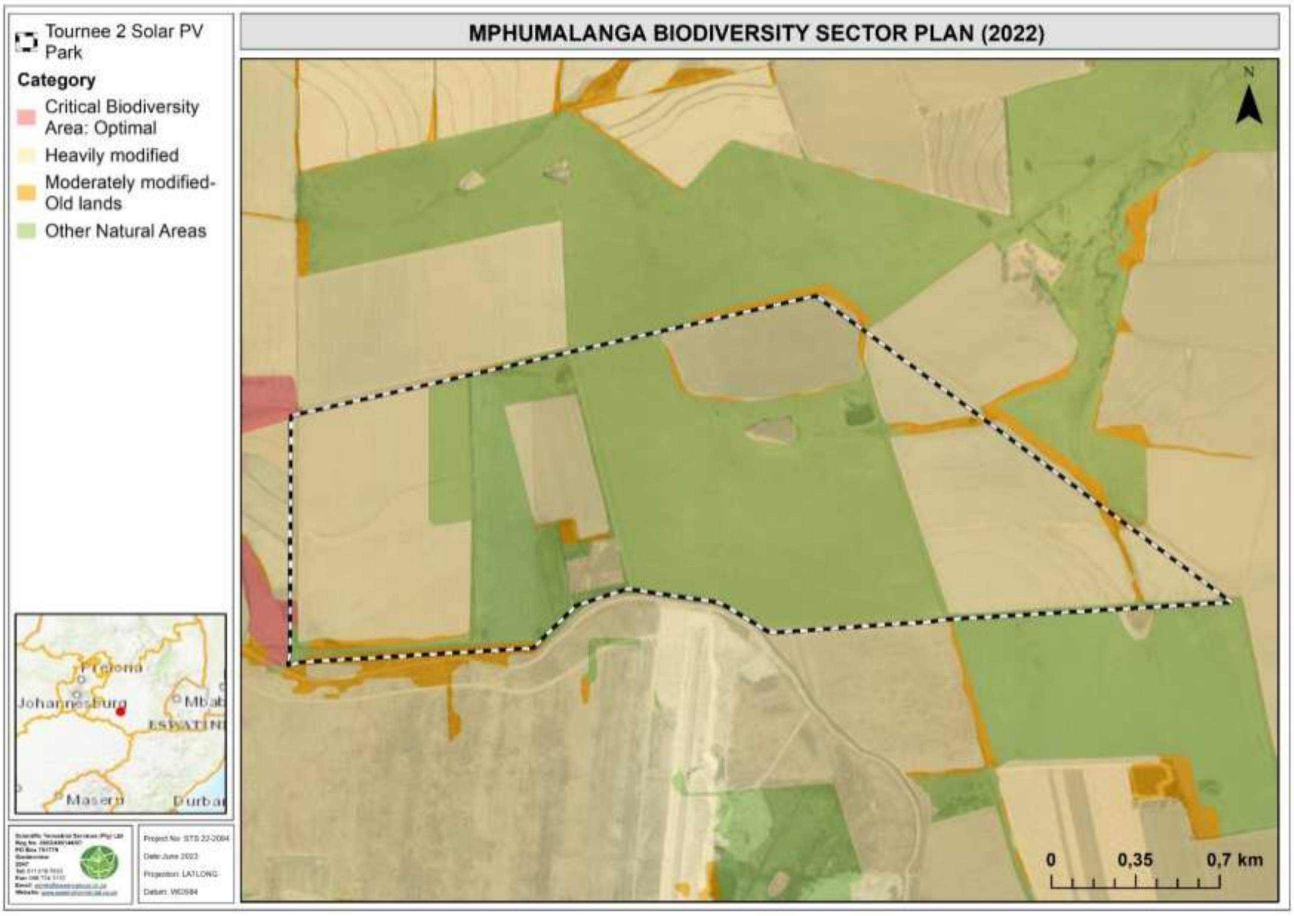


Figure 7-11 - The Tournée 2 Solar PV Facility in relation to the Mpumalanga Biodiversity Sector Plan

Source: STS, 2023

Figure 7-12 - The NPAES database depicting Priority Focus areas within the Tournée 2 Solar PV Facility (NPAES, 2018).

Source: STS, 2023

7.2.3 PLANT SPECIES

The following is extracted from the Floral Impact Assessment compiled by STS and included as ***Appendix H.14***

During the site assessment, three habitat units were identified as shown in **Figure 7-13** and discussed below.

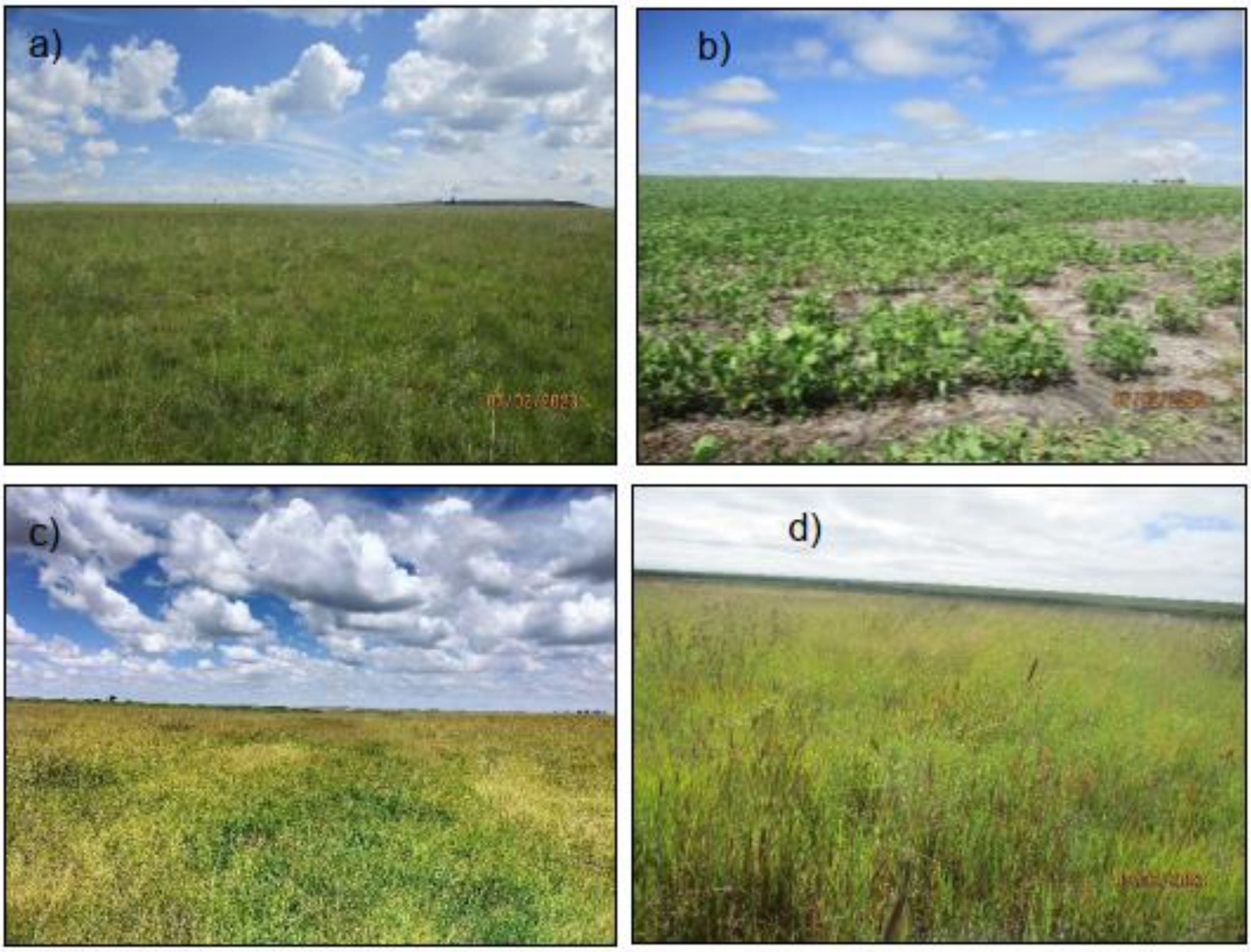


Figure 7-13 – Representative photographs of the vegetation habitat units within the proposed Tournée 2 Solar PV Facility layout

Source: STS, 2023

7.2.3.1 Grassland Habitat (Intermediate Sensitivity)

This grassland vegetation is widespread within the proposed extent of the Tournée 2 Solar PV Facility and is interspersed by cultivated lands and Freshwater Ecosystems. The dominant land-use associated with these remaining sections of grasslands is grazing. The vegetation mostly consists of short-tall, open-closed grasslands (Edwards, 1983), and is still regarded as indigenous vegetation (as per NEMA definition). This habitat unit has a high diversity of graminoid species, however, is dominated by *Eragrostis tef* with high abundance of *Calamagrostis epigejos var. capensis, Digitaria eriantha, Helictotrichon turgidulum* and *Setaria sphacelate var. sphacelate.* The Grassland Habitat has a high diversity and abundance of several Alien Invasive Plant (AIPs) species, especially *Cirsum vulgare, Cosmos bippinatus* and *Verbena bonariensis* being widespread within the Grassland habitat. The Grassland Habitat is no longer considered to be a representative of the reference vegetation type (i.e., Soweto Highveld Grassland) in terms of species composition. Since Mucina and Rutherford (2006) described the Soweto Highveld Grasslands as being dominated almost entirely by *Themeda triandra*, accompanied by a variety of other grasses such as *Elionurus muticus, Eragrostis racemosa, Heteropogon contortus* and *Tristachya leucothrix*, this was not the case within these Grasslands. While the habitat integrity is diminished, the Grassland Habitat is still considered to be in fair ecological condition (i.e., areas that are moderately modified, semi-natural. An ecological condition class in which ecological function is maintained even though composition and structure have been compromised).

This habitat unit has a high diversity of graminoid species, however, is dominated by *Eragrostis tef* (an alien grass species) with high abundances of *Eragrostis chloromelas and Sporobolus fimbriatus.* The Grassland Habitat has a high diversity and abundance of AIPs, especially *Cirsium vulgare* and *Cosmos bipinnatus*. The management of certain AIPs (e.g., NEMBA category 1a, 1b and 2) is compulsory as stated in NEMBA section 73 (2). The habitat integrity is compromised, and the Grassland Habitat is present in an altered state since the grassland habitat has been modified by long term overutilisation by grazing. The Grassland habitat has furthermore experienced historic modification in the form of cultivation; however, the Grassland Habitat has recovered well (i.e., high species diversity) since the cultivation ceased >10 years prior. Therefore, the Grassland Habitat is still considered to be in fair ecological condition (i.e., areas that are moderately modified, semi-natural, and associated with an ecological condition class in which ecological function is maintained even though composition and structure have been compromised).

The Grassland Habitat shows indicators associated with that of a healthy mesic grassland ecosystem including; (i) a relatively high abundance of geophyte species (ii) a moderate diversity of flowering plants (other than grasses) and (iii) the presence of intact, healthy wetlands systems (SANBI, 2013).The vegetation structure of the Grassland Habitat is considered to be representative of the reference vegetation type (i.e., Soweto Highveld Grassland) however it is no longer considered to be a representative of the reference vegetation type in terms of species composition. The species composition of the Grassland Habitat has been modified where several of the species that are typically dominant within the reference state only occur in low abundances due to species such as *Eragrostis tef* now dominating in this habitat. This shift in species composition is likely due to the overarching agricultural land use in the area, which is further exacerbated by altered ecological drivers within the landscape (discussed below) and fragmentation of the habitat unit from larger, more intact grasslands (and hence, source pools).

Fire is an important ecosystem driver within the Mesic Highveld Grasslands (including the reference vegetation type; Soweto Highveld Grasslands); the occurrence of natural fires during the summer months help to maintain the structure of the grasslands and limit the presence and abundance of trees (SANBI, 2013). Furthermore, Mesic Highveld Grasslands are well adapted to grazing pressures when managed at low to moderate stocking rates with adequate rest periods for the veld to recover (SANBI, 2013). These ecological drivers (fire and herbivory) are not entirely absent within this habitat unit, while fire is not excluded from the Grassland Habitat the fire regime has been altered form the natural cycles. Furthermore, while grazing is still present within the Grassland Habitat the overutilization and localized nature of grazing does not reflect acceptable levels to sustain a healthy and functional Mesic Highveld Grassland communities (which can be seen in the abundance and diversity of AIPs).

The Grassland Habitat is still regarded as indigenous vegetation (as per NEMA definition). While these Grasslands have not been irreversible modified (e.g., cultivated) in the past the Grassland Habitat is not considered to be Primary grasslands as land-use modification (i.e., long-term utilization for grazing) has resulted in changes in species composition and an overall lowered habitat integrity.

7.2.3.2 Species Overview

The Grasslands Habitat had an overall high species diversity (i.e., native species). Refer to the below list for an indication of the dominant species recorded within the habitat:

- Forb species: The forb component was well represented and included *Asclepias stellifera, Cholophytum cooperi, Cyanotis speciosa, Gladiolus elliotii, Habenaria epipactidea, Helichrysum nudifolium and Hypoxis rigidula.* Additional forbs associated with this habitat unit included various AIPs, namely *Datura stramonium, Hypochaeris radicata and Verbena bonariensis;*
- Succulent species: None recorded at the time of assessment;
- Graminoid species: A high diversity of graminoid species were associated with this habitat unit, the dominant species included *Eragrostis tef and Eragrostis plana*, other species that was also well represented included species such as *Cymbopogon pospischilii, Hyparrhenia hirta, Setaria sphacelata var. sphacelata and Sporobolus fimbriatus*;
- Woody species: none recorded within this habitat.

7.2.3.3 Species of Conservation Concern

One floral SCC (i.e., RDL or TOPS listed species) in terms of Section 56(1) of the NEMBA, was recorded during the site assessment within the Grassland Habitat namely:

- Kniphofia typhoides (Near Threatened [NT]; Probability of Occurrence [POC] = confirmed).

No protected tree species as per the NFA, were identified during the site assessment for the Tournée 2 Solar PV Facility footprint area.

The Grassland Habitat unit did have several provincially protected species (in terms of the MNCA Schedule 11 - protected species) confirmed on site (and some species which is considered to have high POC), including the following:

- *Gladioulus elliotii* (LC; POC= confirmed);
- *Gladiolus crassifolius* (LC; POC= confirmed);
- *Habenaria falcicornis* subsp. caffra (LC; POC= confirmed).
- *Eucomis autumnalis* (LC; POC= high);
- *Boophone disticha* (LC; POC= high); and
- *Habenaria epipactidea* (LC; POC= high). Other provincially protected species that have a high POC within the Grassland Habitat include:
- All species of Aloes (except those not occurring in Mpumalanga);
- All species of *Crinum.*

7.2.3.4 Transformed Habitat (Low Sensitivity)

Four relatively large portions of the Tournée 2 Solar PV Facility are cultivated with *Zea mays* (i.e., corn) and *Glycine max* (i.e., soybean). These areas have been significantly transformed and are no longer considered to be indigenous vegetation (as per NEMA definition). The boundaries of the cultivated areas are associated with a high abundance of AIPs, including *Ipomoea purpurea, Datura stramonium, Crisum vulgare* and *Cosmos bippinatus*. This habitat unit as such is not representative of the reference vegetation type and is not considered to be of ecological and conservation importance from a floral perspective. The habitat integrity is severely diminished and the Transformed habitat is in poor ecological condition (i.e., areas that are severely or irreversibly modified. An ecological condition class in which ecological function has been compromised in addition to structure and composition).

The Transformed Habitat includes areas cultivated with Glycine max. These areas have been significantly transformed and are no longer considered to be indigenous vegetation (as per NEMA definition). The boundaries of the cultivated areas are associated with a high abundance of AIPs, including *Ipomoea purpurea, Datura stramonium, Cirsium vulgare and Cosmos bipinnatus* (see photograph [c] above). This habitat unit had the native species richness of all the terrestrial habitat units and was mostly associated with AIPs.

Ecosystem drivers such as fire and grazing are absent within these areas and therefore this habitat is no longer considered to be ecologically functional. The Transformed Habitat is no longer considered to contribute to ecological processes (e.g., habitat connectivity) due to the largely modified nature of this habitat unit. The Transformed Habitat unit is not representative of the reference vegetation type, as these areas mostly consist of monospecific crop stands and is not considered to be of ecological and conservation importance from a floral perspective.

The habitat integrity is severely diminished, and the Transformed Habitat is in poor ecological condition (i.e., areas that are severely or irreversibly modified and associated with an ecological condition class in which ecological function has been compromised in addition to structure and composition). No significant biodiversity features were confirmed for this habitat unit.

7.2.3.5 Species Overview

An overview of the species composition of this habitat unit is presented below:

- Woody species: none recording in the area
- Forb species: The forb component was well represented and included *Bidens pilosa (AIP), Conyza bonariensis (AIP), Hypoxis rigidula, Senecio inornatus and Tagetes minuta (AIP)*;
- Succulent species: None recorded at the time of assessment;
- Graminoid species: The Transformed Habitat had a low species richness, where the graminoids were mostly represented by *Brachiaria serrata, Digitaria eriantha, Setaria sphacelata var. sphacelata, Sporobolus pyramidalis and Cyperus congestus.*

7.2.3.6 Species of Conservation Concern

No floral SCC from the TOPS or RDL list were found within the Transformed Habitat and no suitable habitat for such species is present within this habitat unit. No National Forest Act (NFA) protected trees were encountered within the Transformed Habitat unit and no suitable habitat for such species are present within this habitat unit. No Provincially protected species are expected to occur within this habitat unit as it is completely transformed and no indigenous vegetation (as per the NEMA definition) is present. The POC for the trigger species provided by the Screening Tool is low within the Transformed Habitat unit.

7.2.3.7 Freshwater Ecosystem:

The Freshwater Habitat meets the definition of a watercourse in terms of the definition contained within the NWA, furthermore the presence of provincially protected floral species present within the Freshwater Habitat indicates that these systems are important from a floral biodiversity point of view.

The Freshwater Ecosystem had a high species richness and was associated with a high abundance and diversity of native graminoid species; most abundant of which were *Calamagrostis epigejos var. capensis, Setaria sphacelate var. sphacelata, Kyllinga erecta var. erecta and Cyperus rotundus*. Several AIPs were noted within the Freshwater Ecosystem habitat which included, but are not limited to, *Conyza bonariensis, Tagetes minuta, Bidens pilosa, Oenothera rosea, Verbena* *bonariensis.* Within the Freshwater Ecosystems, the spread of AIPs is inevitable due to the occurrence of grazers within these systems, and the fact that watercourses act as dispersal channels for the downstream movement of seeds and other propagules. The movement of herbivores increases the potential for AIPs to spread within this habitat and the surrounding natural vegetation communities, therefore the management of AIPs within freshwater ecosystems should be prioritised as these systems often create dispersal pathways for AIPs. As mentioned within the Grassland Habitat, certain AIPs must be regulated under NEMBA, especially AIPs within freshwater ecosystems. The overall habitat integrity of the Freshwater Ecosystem was considered to be moderately intact, and the habitat was considered to be in a good ecological condition (i.e., areas that are natural or near natural and are associated with an ecological condition class in which composition, structure and function are still intact or largely intact).

The Freshwater Ecosystem is considered to be an important component of the reference vegetation type (i.e., Soweto Highveld Grassland) since the vegetation description provided by Mucina and Rutherford (2006) include the presence of scattered small wetlands, narrow streams and alluvia pans. Furthermore, the Grassland Ecosystem Guidelines (SANBI, 2013) indicate that healthy Mesic Highveld Grasslands are associated with intact, healthy wetlands and river ecosystems, and therefore the presence of intact freshwater features further contributes to the ecological integrity and functioning of the larger Tournée 2 Solar PV Facility. Although the Freshwater Ecosystems are in a modified ecological condition, the wetlands still provide habitat for biota with the dominant vegetation cover comprised of graminoid, sedge and herbaceous species such as *Cyperus congestus, C. esculentus, C. rotundus, Kyllinga erecta var. erecta and Paspalum dilatatum*. The freshwater report (SAS 22 – 1193, 2023) states that the hydraulic regime and geomorphological processes (e.g., natural flow path, flood peaks and sediment balance) of the wetlands have been altered from the natural conditions, however the Freshwater Ecosystem is still considered to be important in providing suitable habitat for some threatened and provincially protected species and contribute to the larger landscape connectivity and ecosystem functioning.

The vegetation is considered indigenous vegetation (definition provided by NEMA), since it has not undergone significant clearance of vegetation within the past 10 years.

7.2.3.8 Species Overview

The Freshwater Ecosystem is associated with a high species diversity, best represented by the grass and forb component, with the woody species being largely absent.

An overview of the species composition of this unit is presented below:

- Woody species: this species was absent in the area
- Forb Species: The forb component was well represented and *included Berkheya setifera, Lobelia flaccida subsp. flaccida, Monopsis decipiens and Ranunculus multifidus*, to name a few;
- Succulent species: Only *Aloe ecklonis* was recorded in this habitat unit.
- Graminoid species: A high species richness was observed within the graminoid species within this habitat unit, especially several sedges, namely *Cyperus congestus, Cyperus esculentus, Cyperus rotundus, Isolepis fluitans var. fluitans and Kyllinga erecta var. erecta*. Grasses associated with this habitat unit included *Agrostis lachnantha, Brachiaria serrata, Calamagrostis epigejos var. capensis, Leersia hexandra and Helictotrichon turgidulum* to name a few.

7.2.3.9 Species of Conservation Concern

No Floral SCC (i.e., RDL or TOPS listed species) were recorded during the site assessment, however suitable habitat for two threatened species is considered to be present within this habitat unit namely;

- *Kniphofia typhoides* (NT; POC= high); and
- Sensitive species 691 (VU; POC= medium).

Furthermore, no protected tree species as per the NFA, were identified during the site assessment for the Tournée 2 Solar PV Facility footprint area and the POC for any to occur within the Freshwater Ecosystem is considered to be low.

However, the Freshwater Ecosystem Habitat did have several provincially protected species in terms of the MNCA Schedule 11 protected species list confirmed on site including the following:

- *Aloe ecklonis (LC; POC = confirmed);*
- *Eucomis autumnalis (LC; POC= high);*
- *Gladioulus elliotii (LC; POC= high);*
- *Gladiolus crassifolius (LC; POC= high);*
- *Habenaria epipactidea (LC; POC= high); and*
- *Habenaria falcicornis subsp. caffra (LC; POC= high).*

Other provincially protected species that have a high POC within the Freshwater Ecosystem include:

- All species of Crinum.

7.2.3.10 Alien Invasive Plant species

South Africa has released several articles of legislation that are applicable to the control of alien species. Currently, invasive species are controlled by the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) – Alien and Invasive Species Regulations, 2020, in Government Gazette 43735 dated 25 September 2020. AIPs defined in terms of NEMBA are assigned a category and listed within the NEMBA List of Alien and Invasive Species (2020) in accordance with Section 70(1)(a) of the NEMBA:

- Category 1a species are those targeted for urgent national eradication;
- Category 1b species must be controlled as part of a national management programme, and cannot be traded or otherwise allowed to spread;
- Category 2 species are the same as category 1b species, except that permits can be issued for their usage (e.g., invasive tree species can still be used in commercial forestry, providing a permit is issued that specifies where they may be grown and that permit holders "Unless otherwise specified in the Notice, any species listed as a Category 2 Listed Invasive Species that occurs outside the specified area contemplated in sub-regulation (1), must, for purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to Regulation 3");
- Category 3 are listed invasive species that can be kept without permits, although they may not be traded or further propagated, and must be considered a Category 1b species if they occur in riparian zones.

A total of 19 AIPs (listed and non-listed) were found within the Tournée 2 Solar PV Facility. Of the 19 species encountered on site, seven species are listed under NEMBA Category 1b, one species is listed under the NEMBA Category 3, and the remaining eleven species are not listed under NEMBA; however, these species are considered problem plants that often establish in disturbed sites or previously cultivated areas, including species such as *Bidens pilosa, Gomphrena celosioides and Tagetes minuta*. These species can often become problematic and pose a threat to biodiversity as these species compete with indigenous native floral species and often replace native floral species.

Due to the extent of AIPs within the Tournée 2 Solar PV Facility, especially those falling in the Category 1b and which occur within the Freshwater Ecosystem, it is highly recommended that an Alien and Invasive Species Control and Management Plan be set up and implemented (by the proponent) to ensure further loss of indigenous floral communities do not occur, and that the freshwater ecosystems are not placed under additional pressure due to the presence of AIPs. Refer to **Figure 7-14** below for more information on the AIPs recorded on site.

Scientific name / Common name	Origin	NEMBA Category	Grassland	Freshwater ecosystems	Transformed
WOODY SPECIES					
Eucalyptus camaldulensis/ **River red gum**	South-eastern Australia	1b	x	x	
Salix babylonica / **Weeping Willow**	Northern China	Not Listed		x	
HERBACEOUS SPECIES					
Amaranthus hybridus/ **Smooth pigweed**	Eastern North America	Not Listed		x	
Bidens pilosa / **Blackjack**	South America	Not Listed	x	x	x
Cirsium vulgare / **Spear thistle**	Europe	1b	x	x	x
Conyza bonariensis / **Hairy fleabane**	South America	Not Listed	x	x	x
Cuscuta campestris / **Common dodder**	Tropical and subtropical Africa, as well as in southern Europe, Asia and Australia	1b			x
Datura stramonium / **Common thorn apple**	North America	1b	x	x	x
Gomphrena celosioides / **Bachelor's Button**	South America	Not Listed		x	x
Hibiscus trionium / **Flower-of-an-hour**	Europe	Not Listed	x	x	
Hypochaeris radicata / **Hairy cat's ear**	Native to Morocco	Not Listed	x	x	
Ipomoea purpurea / **Common morning glory**	Tropical America.	1b	x		
Oenothera rosea / **Evening primrose**	Central America (Mexico)	Not Listed	x	x	x
Tagetes minuta / **Khaki-weed**	Southern half of South America	Not Listed	x	x	x
Verbena bonariensis / **Purple top**	Tropical South America	1b	x	x	x
Xanthium strumarium / **Common cocklebur**	South America.	1b	x		
GRAMINOID SPECIES					
Paspalum dilatatum / **Dallisgrass**	South America. Brazil, Argentina, Bolivia, Chile, Guyana, Paraguay, and Uruguay	Not Listed		x	x
Cenchrus longisetus / **Feathertop**	Native to north-eastern Africa (i.e., Eritrea, Ethiopia and Somalia) and the Arabian Peninsula (i.e., Yemen)	3			x
Eragrsotis tef / **Teff**	Northern Ethiopia	Not Listed	x	x	

Figure 7-14 - Dominant alien floral species identified during the field assessment with their invasive status as per NEMBA: Alien and Invasive Species Lists, GN R1003 of 2020

7.2.4 ANIMAL SPECIES

*The following is extracted from the Faunal Impact Assessment compiled by STS and included as **Appendix H.15***

The Tournée 2 Solar PV Facility consists largely of agricultural fields and grassland areas utilised for grazing cattle. Natural patches of vegetation are scattered within the Tournée 2 Solar PV

Park and are small in extent and fragmented. The following habitat units have been described for the Tournée 2 Solar PV Facility as per the **Section 7.2.3** above:

Grassland Habitat: The grassland vegetation is widespread within the proposed extent of the Tournée 2 Solar PV Facility and is located amongst cultivated lands and Freshwater Ecosystems. The dominant land-use associated with these remaining sections of Grassland Habitat is grazing by livestock such as cattle.

Freshwater ecosystems: Distributed through the north-western and eastern portions of the Tournée 2 Solar PV Facility. This habitat provided important habitat for faunal species dependant on surface water and areas of increased moisture, whilst the increased vegetation growth provided important cover and food resources for herbivorous species.

Transformed Habitat: Portions of the Tournée 2 Solar PV Facility which are characterised by habitat that has undergone significant transformation through clearance of vegetation (roads and houses) or cultivation. The agricultural fields provide limited habitat for fauna as the vegetation is largely homogenous and does not support an increased diversity of fauna.

During the site assessment between 6th of February and the 9th of February 2023, a moderate abundance of faunal species (in comparison to expected species presence) from different classes were observed within the Tournée 2 Solar PV Facility. One mammal Species of Conservation Concern (SCC) was confirmed within the Tournée 2 Solar PV Facility, as well as suitable habitat for several other potential SCC known to occur in the greater area. The below sections provide a brief breakdown of the faunal classes represented in the Tournée 2 Solar PV Facility.

7.2.4.1 Mammal habitat and diversity

Tournée 2 Solar PV Facility is situated the following Quarter Degree Square (QDS) 2629CD and Animal Demography Units (ADU) Virtual Museum (VM) indicates that there are 7 (QDS: 2629CD) recorded mammal species, whilst iNaturalist indicates no records for the area. The lack of data for this area is more likely linked to the fact that these private lands are largely under sampled, and not considered a direct indication of mammal diversity and abundance. During the site assessment, it was noted that the majority of mammal species activity (direct and indirect species observations) was centralised in around the Grassland and Freshwater ecosystem habitats. These habitats, whilst impacted by the adjacent farming practices, have been largely excluded from any cultivation / agricultural activities (ploughing) and are used primarily for grazing of cattle. This has allowed mammal species which are more adept and adapted to these agricultural areas, to continue inhabiting the Tournée 2 Solar PV Facility, albeit at lower abundances.

The Freshwater Ecosystem habitats provide important niche habitat for water dependant mammal species, serve as an important source of surface water as well as important movement corridors for mammal species in the region. It is however noted these Freshwater Ecosystem habitats did appear to have increased levels of nitrates, likely as a result of runoff from the surrounding Transformed habitat in where fertiliser was being sowed to promote grass regrowth for fodder production. Mammal species activity / signs thereof were limited in the proposed Tournée 2 Solar PV Facility footprint area. This is likely attributable to the lack of suitable preferred habitat and the current land use activities in these areas. During the field assessment mammal species appeared to make use of the Grasslands and Freshwater ecosystem habitats, where they would likely be subjected to lower levels of anthropogenic activities and impacts.

Figure 7-15 – a.) Spoor of Sylvicapra grimmia (Grey Duiker); b.) Quil of Hystrix africaeaustralis (Porcupine) and c.) Group of Antidorcas marsupialis (Springbuck) and Damaliscus pygargus phillipsi (Blesbok) grazing together.

Source: STS, 2023

7.2.4.2 Mammal SCC

- ***Crocidura maquassiensis* (Makwassie Musk Shrew),** *C. maquassiensis* is found in rocky, mountain habitats. It may tolerate a wider range of habitats; individuals have been recorded in mixed bracken and grassland as well as urban environments. Grassland habitat is considered of marginal suitability (IUCN, 2023). The proposed Tournée 2 Solar PV Facility layout is unlikely to pose a threat to this species nor impact on suitable habitat. **RSA Status=VU, POC=Medium**
- ***Ourebia ourebi ourebi (Oribi)*,** Oribi inhabit savanna woodlands, floodplains and other open grasslands, from around sea level to about 2,000m asl, reaching their highest density on floodplains and moist tropical grasslands, especially in association with large grazers. This species may occur within the larger Tournée 2 Solar PV Facility, however hunting by humans and dogs will likely be a notable limiting factor. This species is unlikely to occur within the proposed layout footprint due to suboptimal habitat. **RSA Status=EN, POC=Low**
- ***Aonyx capensis* (Cape Clawless Otter),** African clawless otters are primarily aquatic and reside near perennial and episodic springs or rivers. These otters prefer shallow water with thick reed beds, which are home to several favourable prey such as crab and fish. On land, African clawless otters take shelter in underground burrows, under rocks, roots, or dense vegetation. Tracks of this species were recorded in the far south-eastern section of the Tournée 2 Solar PV Facility. This core habitat will not be impacted by the proposed development and connectivity of this habitat in the landscape will be maintained. **RSA Status=NT, POC=Confirmed**
- ***Atelerix frontalis* (Southern African Hedgehog),** Hedgehogs can often be found within savannah and grassland vegetation types (Skinner & Chimimba 2005). They require ample ground cover, for cover, nesting and insect food sources (Skinner & Chimimba 2005). One of the key grassland vegetation types for this species, which was observed in the Tournée 2 Solar PV Facility, however the grassland habitat may also be utilised by this species. The Tournée 2 Solar

PV Facility provides suitable habitat and food resources for this species. The proposed Tournée 2 Solar PV Facility footprint is however unlikely to impact this species as the layout is located in agricultural field. This species is more likely to occur closer to the wetland systems which will not be impacted by the proposed development and connectivity of this habitat in the landscape will be maintained. **RSA Status=NT, POC=medium**

- ***Leptailurus serval*** **(Serval),** Servals are mostly found in and around marshland, well-watered savannah and long-grass environments, and are particularly associated with reed-beds and other riparian vegetation types (Thiel 2015). Key vegetation types are wetlands, grasslands (with a preference for long, rank grass), and indigenous vegetation that can provide cover and allow dispersal. This core habitat will not be impacted by the proposed development and connectivity of this habitat in the landscape will be maintained. **RSA Status=NT, POC=low**

7.2.4.3 Herpetofauna (Reptiles and Amphibians) Habitat and diversity

During the site assessment, no reptile SCC were observed whilst a low abundance of common reptile species were recorded. Reptiles are inherently difficult to observe during assessments of short duration, more especially in grassland habitats. The relative low reptile activity was also likely attributable to the weather patterns experienced during the site assessment, with cloud cover and rain resulting in many reptile species opting to decrease their daily activity patterns and seek shelter than be exposed to the elements. Although there is suitable habitat available and reptile species distribution ranges overlap with the site, background studies and data collected indicates that there is likely a low potential for reptile SCC to occur within the Tournée 2 Solar PV Facility.

Amphibian populations are likely to be focused within the freshwater ecosystem especially areas with permanent water. *Pyxicephalus adspersus* (Giant African Bullfrog, NT) is likely to be present within the Freshwater Ecosystem and Grassland habitat unit. Their habitat includes a wide variety of environments including savannahs, grasslands and freshwater habitat. When not breeding, it can travel up to 4 km from water, foraging for insects. Their breeding habitat, in the form of shallow, stagnant temporary waters in wetlands and pans, are present in or close to the study area. Adults may be buried beneath the soil in the dry season.

Tournée 2 Solar PV Facility is situated the following Quarter Degree Square (QDS) 2629CD and Animal Demography Units (ADU) Virtual Museum (VM) indicates that there are no herpetofauna species recorded in QDS 2629CD, whilst iNaturalist indicates one amphibian species for the area. Whilst it is likely that this degree of herpetofauna diversity is underrepresented, it is notably that there are no records of SCC or RDL species for the QDS's. During the site assessment, a single common amphibian species was observed, namely Amietia delalandii (Common River Frog). The Freshwater Ecosystem, considered ideal habitat for amphibians, were notably devoid of amphibian activity, with no signs of tadpoles or frogs jumping from the bankside vegetation into the water. Only the larger dam in the north of the Tournée 2 Solar PV Facility appeared to host several common river frog individuals, whilst this species was not observed elsewhere.

Although not observed, it is likely that the Tournée 2 Solar PV Facility will host several common amphibian species, as there is suitable habitat and food resources available within the Freshwater Ecosystem habitat.

Reptiles are equally hard to detect during assessments of limited duration, however, areas of known reptile refuge (rock/rubble piles) where searched, but none were found during the field assessment, an observation of Psammophylax rhombeatus (Rhombic Skaapsteker) just north Tournée 2 Solar

PV Facility. Skinks and lizards are readily able to prey upon the abundance of insect species, whilst larger predatory snakes will readily prey upon small mammals, reptiles and amphibians within the Tournée 2 Solar PV Facility.

Amphibian and reptile species will likely make use of the Freshwater Ecosystem as corridors for movement, however they will likely also traverse through the grasslands beyond the Tournée 2 Solar PV Facility boundaries. Suitable habitat can readily be found beyond the Tournée 2 Solar PV Facility boundaries, as such, but the Tournée 2 Solar PV Facility is unlikely to host unique or remnant amphibian or reptile populations. The proposed footprint is unlikely to pose a significant risk or threat to the current herpetofaunal assemblages.

Figure 7-16 – a.) Freshwater habitat that will be used by amphibian species; b.) Hystrix africaeaustralis (Cape Porcupine) burrow that will be used by reptile species for refuge.

Source: STS, 2023

7.2.4.4 HERPETOFAUNA SCC

- ***Pyxicephalus adspersus* (Giant Bullfrog),** Inhabits a variety of vegetation types in the Grassland, Savanna, Nama Karoo, and Thicket biomes. It typically breeds in seasonal, shallow, grassy pans in flat, open areas but also utilizes non-permanent vleis and shallow water on the margins of waterholes and dams. Although they sometimes inhabit clay soils, they prefer sandy substrates. Whilst there appear to be no records of this species for the study or surrounding areas, the wetlands and degraded grasslands have the potential to host this species and provide suitable breeding and aestivation sites. The current layout is unlikely to impact on this species, as the wetland systems, considered important for breeding, are located outside of the footprint areas. Aestivation areas, likely the Degraded Grassland habitat as it is not actively cultivated or fertilised, are also excluded from the proposed layout. **RSA Status=VU, POC=Medium**

7.2.4.5 Invertebrate Habitat and Diversity

Insects:

The area is not known to host niche or specialist insect species, however this may be a result of historic land-use activities including crop spraying which may have led to the loss of such species from the region prior to more detailed sampling taking place. During the site assessment, a limited abundance and diversity of insects were observed, with the highest abundances, as expected, being around the Freshwater Ecosystem areas. Insects are usually the most abundant macro-organisms within landscapes and often perform services vitally important for ecosystem functioning. A high abundance and diversity of insects is generally accepted as being needed to help maintain healthy landscapes and ecosystems.

Arachnids:

One spider was observed, while no scorpions during the field assessment. In addition to the limited observations of arachnids. Although not observed during the site assessment, it is likely that the Tournée 2 Solar PV Facility will host several common spider species of the *Genus Oxyopes* (Grass Lynx Spiders), *Genus Thanatus and Genus Hogna* (Wolf Spiders). Scorpions are notably hard to detect as they are predominantly nocturnal, seeking refuge in burrows and under rocks / fallen logs during the day. The Tournée 2 Solar PV Facility may provide habitat to common scorpion species such as *Uroplectes triangulifer* (Highveld Lesser-Thicktail Scorpion).

The Tournée 2 Solar PV Facility invertebrate diversity was low during the site assessment and dominated by the following orders: *Lepidoptera, Coleoptera* and *Orthoptera*. This can be due to agricultural activities in the area as insecticide is used to control pests on agricultural fields and will negatively affect invertebrates in the area.

Figure 7-17 a.) Gryllus bimaculatus (Common Garden Cricket); b.) Astylus atromaculatus (Spotted Maize Beatle) and c.) Trithemis arteriosa (Brown-veined White). Source: STS, 2023

7.2.4.6 Invertebrate SCC

- ***Lepidochrysops procera* (Potchefstroom Blue)**, This species is best known from rocky areas in grassland (and grassy areas in savanna), where it is supported by its larval host plant, *Ocimum obovatum*. The early life stages of this species are unrecorded, but the presence of the host ant (probably a *Camponotus* species) will be an additional requisite. No activities are planned for areas of preferred habitat as such, this species is not considered to be at risk from the proposed activities. **RSA Status=Rare, POC=Low**

7.2.5 AVIFAUNA

*The following is extracted from the Avifauna Assessment compiled by Volant Environmental (Pty) Ltd and included as **Appendix H.6.***

7.2.5.1 Description of Ecoregion

The proposed Project Area of Influence (PAOI) falls across the Grassland Bioregion with Soweto Highveld Grassland vegetation present across the entire proposed development site (SANBI 2018, **Figure 7-19**). The extent of the Grassland Biome is relatively well defined on the basis of the specific known vegetation structure when seen in combination with the amount of rainfall in the summer and the average minimum temperatures in the winter. This biome occurs mainly on the high central plateau (Highveld), as well as the inland areas of the eastern seaboard and the established mountainous areas of KwaZulu-Natal and Eastern Cape. The biome is primarily characterised as flat to rolling, but also includes mountainous regions and escarpments. The effect of this biome being at a higher altitude result in larger temperature differences at different times of the year.

The climate in winter months specifically, can be cold and dry with the occurrence and relative high frequency of frost (**Figure 7-18**). The presence of high amounts of moisture allows for grassland regions to be divided into two classes. Moist grassland primarily consists of sour grasses, leached and dystrophic soils and high canopy cover, high plant production and high fire frequency. Dry grasslands are seen as sweet, palatable grasses, where the soils are less leached and are eutrophic and canopy cover, plant production and fire frequency are lower than in moist grasslands. Grasslands are structurally simple and strongly dominated by grasses (*Poaceae*). It is noted that the moisture index effects canopy cover and decreases with lower mean annual rainfall but is influenced by the amount and type of grazing and by the presence of fire. This in turn allows for woody species to occur but are limited to specialised niches/habitats within the grassland biome. Soweto Highveld Grassland specifically is characterised by a moderately undulating landscape on the Highveld plateau. It primarily supports short to medium-high, dense, grassland that is almost entirely dominated *Themeda triandra*. In places that are not disturbed, scattered small wetlands, pans (**Figure 7-19**) and occasional ridges or rocky outcrops are found that interrupt the continuous grassland cover. These ecoregion characteristics were used when assessing avifaunal habitat as well as species assemblages that could be present on the PAOI.

The warmest month (with the highest average high temperature) is February (28.95°C) while the coldest month (with the lowest average low temperature) is June (8.8°C). The area receives an average of 177 mm of rain during January, which is the wettest month of the year based on averages.

Figure 7-18 – Examples of winter vegetation found on the Project Area of Influence

Source: Volant, 2023

Figure 7-19 – Examples of summer vegetation found on the Project Area of Influence

Source: Volant, 2023

The extent of the Grassland Biome is relatively well defined on the basis of the specific known vegetation structure when seen in combination with the amount of rainfall in the summer and the average minimum temperatures in the winter. This biome occurs mainly on the high central plateau (Highveld), as well as the inland areas of the eastern seaboard and the established mountainous areas of KwaZulu-Natal and Eastern Cape. The biome is primarily characterised as flat to rolling, but also includes mountainous regions and escarpments. The effect of this biome being at a higher altitude results in larger temperature differences at different times of the year.

The climate in winter months specifically, can be cold and dry with the occurrence and relative high frequency of frost. The presence of high amounts of moisture allows for grassland regions to be divided into two classes. Moist grassland primarily consists of sour grasses, leached and dystrophic soils and high canopy cover, high plant production and high fire frequency. Dry grasslands are seen as sweet, palatable grasses, where the soils are less leached and are eutrophic and canopy cover, plant production and fire frequency are lower than in moist grasslands. Grasslands are structurally simple and strongly dominated by grasses (*Poaceae*).

It is noted that the moisture index affects canopy cover and decreases with lower mean annual rainfall but is influenced by the amount and type of grazing and by the presence of fire. This in turn allows for woody species to occur but are limited to specialised niches/habitats within the grassland biome. Income Sandy Grassland vegetation is known by very flat areas with generally shallow, poorly drained, sandy soils. These soils are known for supporting low, tussock-dominated sourveld forming a mosaic with wooded grasslands and on well-drained sites with the trees.

The warmest month (with the highest average high temperature) is February (29.1ºC) while the coldest month (with the lowest average low temperature) is July (17.75ºC). The area receives an average of 190.31mm of rain during January, which is the wettest month of the year based on averages.

7.2.5.2 Protected Areas

A search was conducted to identify any protected areas present within 100 km of the proposed SEF project area using the South African Protected Area Data (SAPAD 2022 Q1). The identified public/privately owned protected areas are listed the table below (**Table 7-4**). The reserves consist of privately as well as publicly owned land, used for wildlife conservation as well as specific livestock farming.

Table 7-4 - The identified public/privately owned protected areas identified close to proposed SEF

Name	Location from SEF Site
Moreson Nature Reserve	98 Km Southwest
Shozaloza Safaris	100 Km Southwest
Lorensa Game Farm	90 Km Southwest
Vaaldam Nature Reserve	90 Km West
S.J. Van Der Merwe Private Nature Reserve	90 Km West
Daisy Private Nature Reserve	100 Km Northwest
Voortrekker Private Nature Reserve	99 Km Northwest
Nicolaas Private Nature Reserve	99 Km Northwest
Devon Protected Environment	96 Km Northwest
John Cairns Private Nature Reserve	97 Km North
Witbank Nature Reserve	98 Km North
Heyns Private Nature Reserve	98 Km North
Burnside Private Nature Reserve	99 Km North

Name	Location from SEF Site
Chrissiesmeer Protected Environment	90 Km Northeast
Rietvlei Private Nature Reserve	59 Km Northeast
Ahlers Private Nature Reserve	73 Km Northeast
Langcarel Private Nature Reserve (in de-proclamation process)	65 Km East
Jericho Dam Nature Reserve	100 Km East
Majuba Nature Reserve	43 Km Southeast
Afrikan Farms Protected Environment	47 Km Southeast
Mabola Protected Environment	97 Km Southeast
Tafelkop Nature Reserve	97 Km Southeast
Mkhothane Protected Environment	73 Km Southeast
Lotterkrantz Private Nature Reserve	47 Km South
Sneeuberg Protected Environment	85 Km South
Rosedale Private Nature Reserve	98 Km South

7.2.5.3 Potential Species Present on the PAOI

Based on a list of bird species drawn from the SABAP 2 pentads that both cover and surround the PAOI, a total of 201 potential species have been identified to occur on or around the PAOI via desktop analysis. The desktop study identified 30 Priority Species (**Table 7-5**). From this list of potential priority species, eight species have an Overall Priority Score of 290 or higher, placing them in the top 30 priority species as ranked by Birdlife South Africa. These key species include Southern Bald Ibis, Blue Crane, Secretarybird, African Marsh Harrier, Lanner Falcon, African Fish Eagle, Greater Flamingo and, Lesser Flamingo. Only one of these key priority species have been confirmed to occur on the PAOI, with a single observation of Secretarybird in January 2023.

Based on the habitat present, eleven of the 30 listed priority species are very unlikely to utilize the PAOI with any regularity, whilst a further nine species are likely to occur on the PAOI, based on habitat suitability, but were however not located during the survey period. These include Blue Crane, African Marsh Harrier, Lanner Falcon, African Fish Eagle, White Stork, Lesser Kestrel, Montagu's Harrier, Greater Kestrel, and Spotted Eagle Owl.

Table 7-5 - Priority species that could potentially occur on the Project Area of Influence. Priority species recorded on site or within 10 km of site, marked with 'x' and highlighted red

	Common Name	Scientific Name	Recorded (x)	Likely (x)	Score
1	Southern Bald Ibis	*Geronticus calvus*			330
2	Blue Crane	*Grus paradisea*		x	320
3	Secretarybird	*Sagittarius serpentarius*	x		320
4	African Marsh Harrier	*Circus ranivorus*		x	300
5	Lanner Falcon	*Falco biarmicus*		x	300
6	African Fish Eagle	*Haliaeetus vocifer*		x	290
7	Lesser Flamingo	*Phoenicopterus minor*			290
8	Greater Flamingo	*Phoenicopterus ruber*			290
9	Blue Korhaan	*Eupodotis caerulescens*	x		270
10	Pallid Harrier	*Circus macrourus*			260
11	Jackal Buzzard	*Buteo rufofuscus*	x		270
12	Caspian Tern				240
13	Peregrine Falcon	*Falco peregrinus*			240
14	Osprey	*Pandion haliaetus*			230
15	White Stork	*Ciconia ciconia*		x	220
16	Lesser Kestrel	*Falco naumanni*		x	214
17	Montagu's Harrier	*Circus pygargus*		x	210
18	Common Buzzard	*Buteo buteo*	x		210
19	Amur Falcon	*Falco amurensis*	x		210
20	Black-winged Pratincole	*Glareola nordmanii*			202
21	Marsh Owl	*Asio capensis*	x		190
22	Grey-winged Francolin	*Scleroptila africanus*	x		190
23	Long-crested Eagle	*Lophaetus occipitalis*			190
24	African Harrier-Hawk	*Polyboroides typus*	x		190
25	Northern Black Korhaan	*Afrotis afraoides*			180

	Common Name	Scientific Name	Recorded (x)	Likely (x)	Score
26	Black-winged Kite	*Elanus caeruleus*	x		174
27	Greater Kestrel	*Falco rupicoloides*		x	174
28	Red-footed Falcon	*Falco vespertinus*			174
29	Spotted Eagle Owl	*Bubo africanus*		x	170
30	Black Sparrowhawk	*Accipiter melanoleucus*	x		170
TOTALS			10	9	

7.2.5.4 Important Bird and Biodiversity Areas (IBAs)

Important Bird and Biodiversity Areas (IBAs) are defined by Birdlife International, as sites of global significance for bird conservation, identified nationally through multi-stakeholder processes using globally standardized, quantitative, and scientifically agreed criteria. These areas are seen as the most important sites for conservation and must be considered during avifaunal impact assessments.

The closest IBA (17 Km East) from the PAOI is known as Amersfoort–Bethal–Carolina District IBA. This specific IBA stretches throughout Mpumalanga province and covers an area of 343 320 ha (**Figure 7-20**). The IBA is classified as an unprotected site which correlates to no official protection under the National Environmental Management: Protected Areas Act (2003). However, the conservation response is not completely absent from unprotected IBAs with input from civil society groups, a degree of monitoring, research and conservation action still taking place at sites of biological significance.

Species found within this IBA that are of conservational concern is the globally threatened Botha's Lark, with 10% of the global population suspected to be present within this area. Other globally threatened species are Blue Crane, Southern Bald Ibis, Black Harrier, Blue Korhaan, Black-winged Pratincole, Secretarybird, Martial Eagle and Denham's Bustard. Regionally threatened species are African Grass Owl, White-bellied Korhaan and Lanner Falcon. Restricted-range and biome-restricted species are the previously mentioned Botha's Lark, and Buff-streaked Chat.

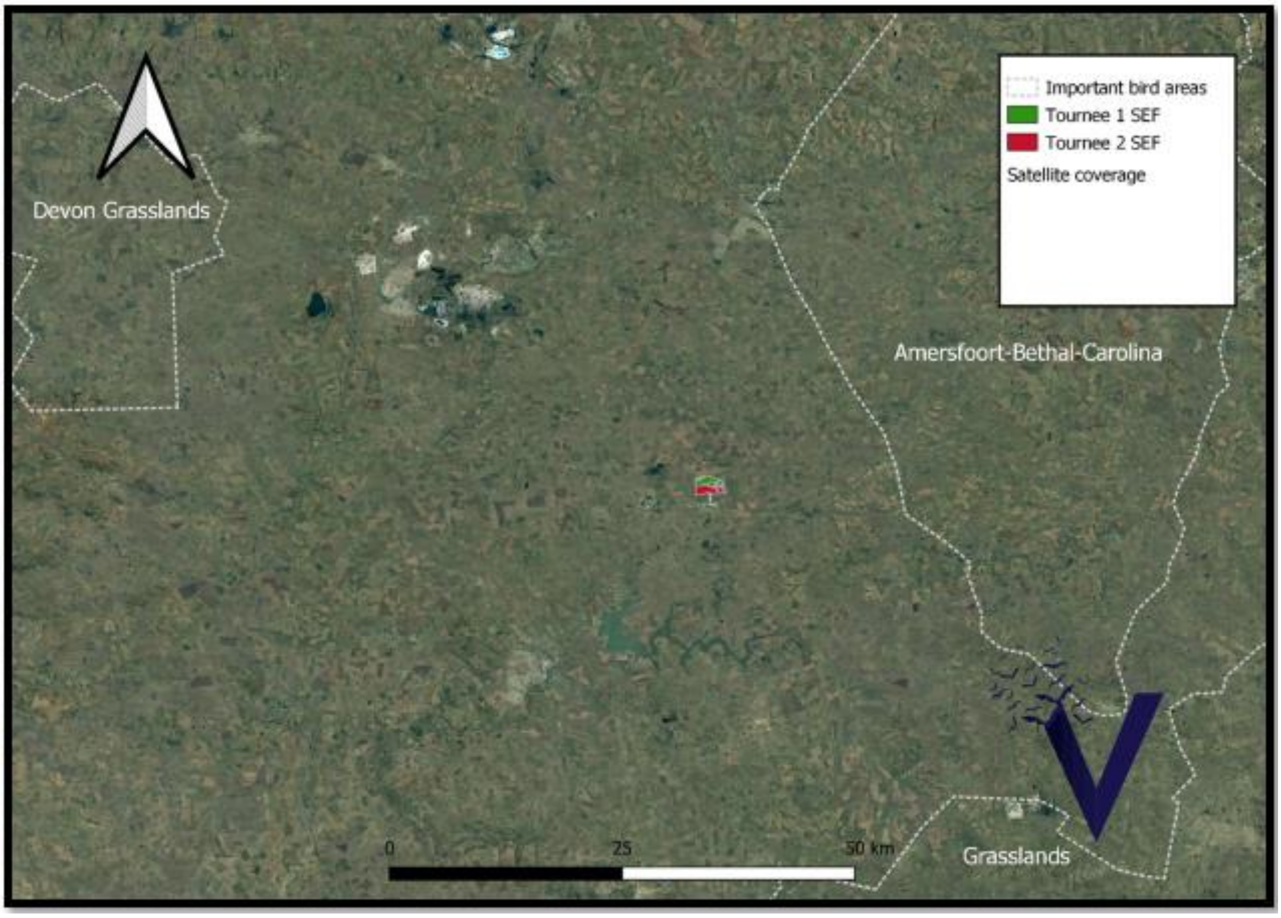


Figure 7-20 – Position of Important Bird Areas (IBAs) in relation to the Tournée 1 and Tournée 2 Solar PV facilities

Source: Volant, 2023

7.2.5.5 Observed Species

All species that were seen or heard on an adhoc basis, or during both walked transect and driven coverage were recorded. A total of 90 unique species of avifauna were identified on the PAOI and the surrounding area. Of this list, priority species observed within the PAOI included Secretarybird, Blue Korhaan, Jackal Buzzard, Common Buzzard, Amur Falcon, Marsh Owl, Grey-winged Francolin, African Harrier Hawk, Black-winged Kite, and, Black Sparrowhawk.

Locality data for all priority species sightings on the PAOI have been mapped and ranked according to their priority scores (**Figure 7-21**).

- Low risk (green), priority score of 170 – 209.
- Medium risk (yellow) priority score of 210 – 289.
- High risk (red), priority score of 290 – 405.

These sightings include fly-overs from raptors and other priority species that may not be impacted significantly by the development of the SEF.

Data obtained from the walked transects across the Tournée SEF Cluster, indicated a moderate to low diversity with 50 species recorded across transects in January (**Figure 7-22**), 51 species in April

(**Figure 7-23**), and 32 species recorded in July (**Figure 7-24**). As excepted, the winter surveys produced lower species counts, and many migrants had returned to the northern hemisphere, and grassland birds were not as vocal outside of the breeding season. The ten most abundant birds recorded in each seasonal survey included few priority species, with the risk for Marsh Owls being mitigated by buffering the wetlands and drainage lines, whilst Black-winged Kite adapt to developed land and will likely remain in the area during and post construction.

Figure 7-21 – Location of priority species across the Tournée SEF

Source: Volant, 2023

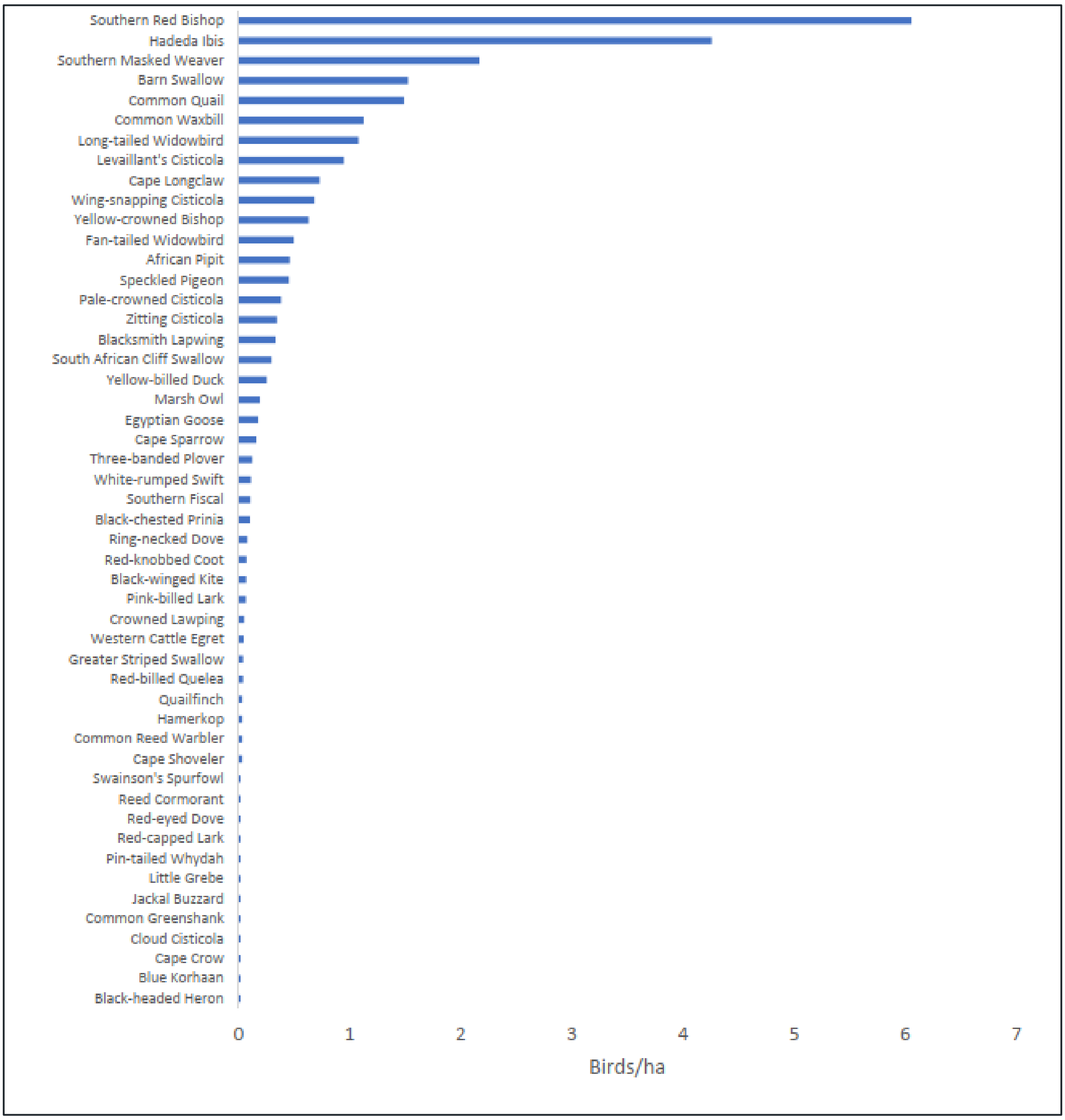


Figure 7-22 – Abundance of bird species recorded on walked transects during January

Source: Volant, 2023

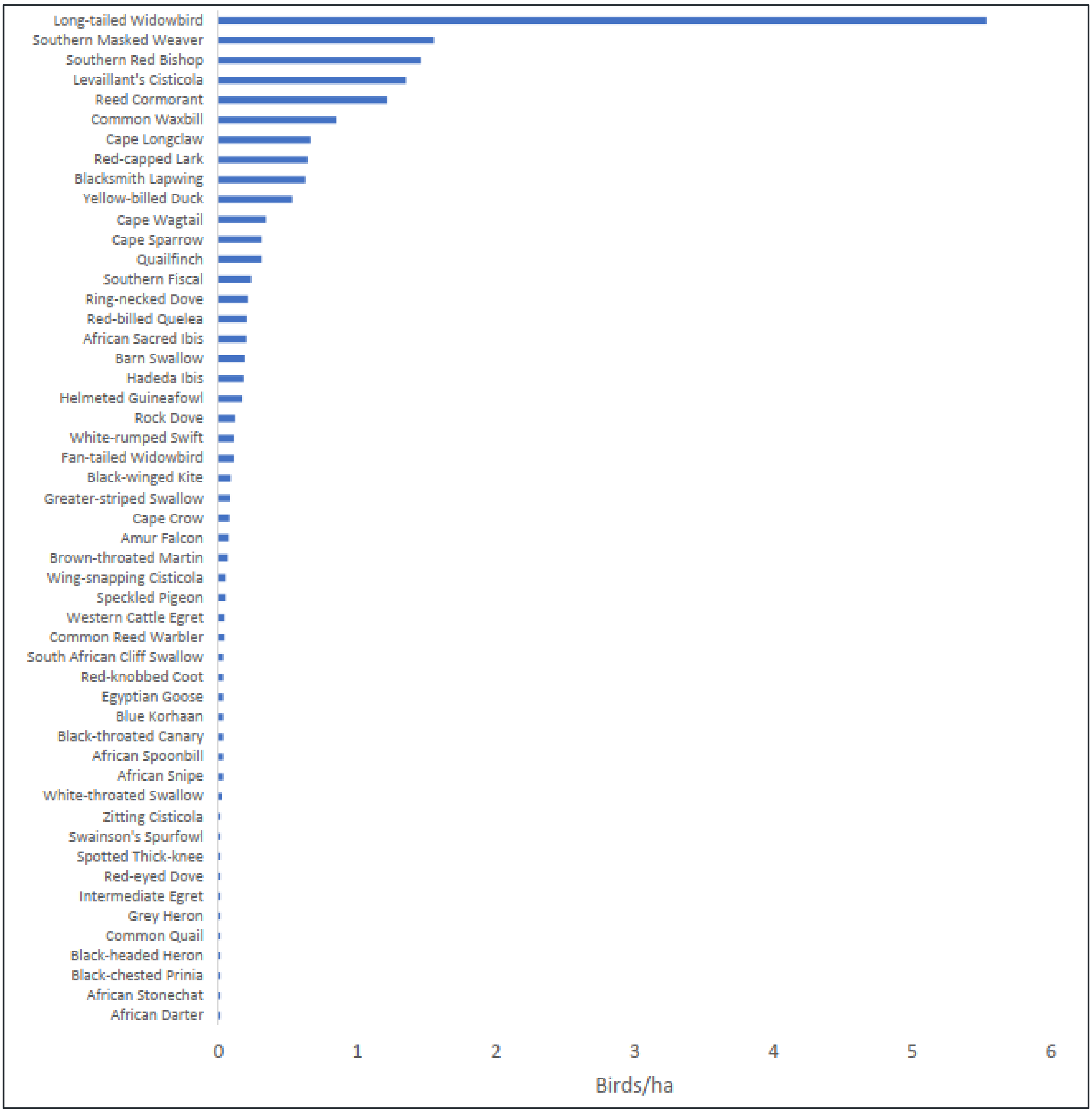


Figure 7-23 – Abundance of bird species recorded on walked transects during April

Source: Volant, 2023

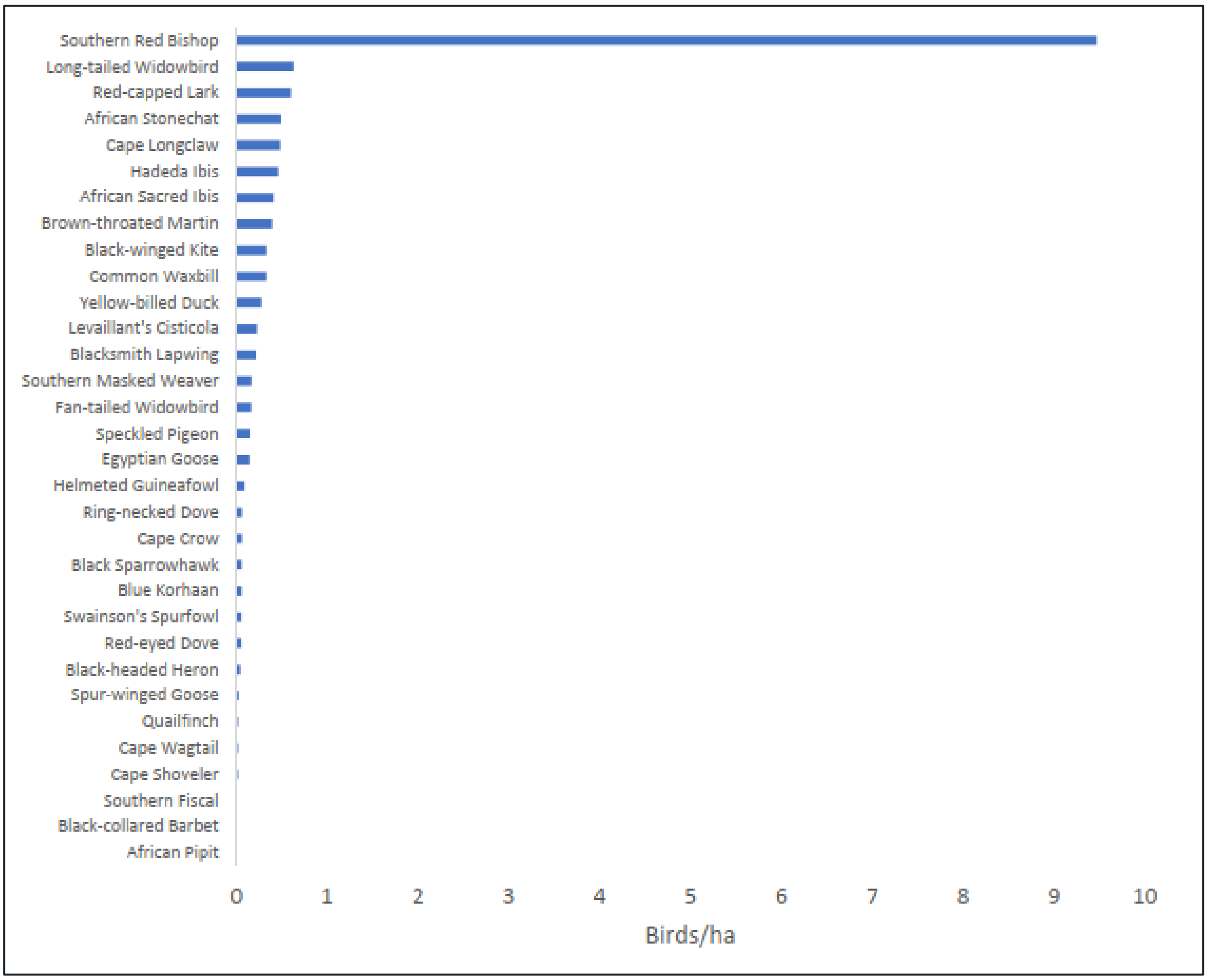


Figure 7-24 – Abundance of bird species recorded on walked transects during July

Source: Volant, 2023

7.2.5.6 Sensitive Bird Areas

Large farm dams, wetlands, and any of their drainage lines were walked to survey for Priority Species and ascertain whether they could serve as breeding or roosting sites for Priority Species. No nests or active roost sites were located in these sensitive areas during either of the two survey periods. However, due to the presence of numerous priority species which would utilize these habitats, a 100-meter solar-panel free buffer has been included around the wetlands, and waterbodies (**Figure 7-25**).

Figure 7-25 – Sensitive bird areas located on the Project Area of Influence

Source: Volant, 2023

7.2.6 BATS

*The following is extracted from the Bats Assessment compiled by Volant Environmental (Pty) Ltd and included as **Appendix H.7.***

7.2.6.1 Potential species present in the area

The desktop study revealed that seven could potentially be found in the area. A *single L. capensis* was captured less than 30 km south form site, but no other species have museum records within 60 km from the PAOI (ARC 2020).

7.2.6.2 Passive monitoring

Only one species of bat, *L. capensis*, was recorded during passive monitoring, and in relatively low numbers. *Laephotis capensis* is not endemic to South Africa and not listed as Least Concern based on the IUCN red data lists. These bats roost under the bark of trees and in the roofs of houses and as such there could potentially be roosts available for this species.

Normally one expects bat activity to peak early in the evening as bats are more active during these times, however, bat activity at the Tournée 1 and Tournée 2 SEFs peaked during the middle of the evening at 23:00. This is a strong indication that there are no bat roosts or colonies present close to the PAOI, as there would have been a peak in activity much earlier. Bat activity also ends early at

2:00, indicating that there are no bats in the area returning to roosts. It must, however, be stated that an accurate estimate of bat activity cannot be obtained during three nights of monitoring and that more data is required.

7.2.6.3 Roost inspections

All potential roosts were inspected for signs of bats, including large trees and a cluster of buildings (**Figure 7-26**). Although the buildings appear to provide suitable roosting locations (**Figure 7-27**), we were unable to detect any signs of bats, nor record any calls. These buildings are all located in the north-eastern section of the PAOI and includes a homestead and several storage facilities. Considering the close proximity of these buildings to the bat detector placed on the PAOI, and the low number of calls recorded, it is highly unlikely that these buildings are utilised by bats. Several patches of exotic trees were also found on the PAOI, but we did not detect any bats or active roosts in any of these trees (**Figure 7-28**).

No caves were found within the boundaries of the PAOI, and there are no known caves present within 20 km of any sites. The landowner was asked about caves on their properties, but he was not aware of any.

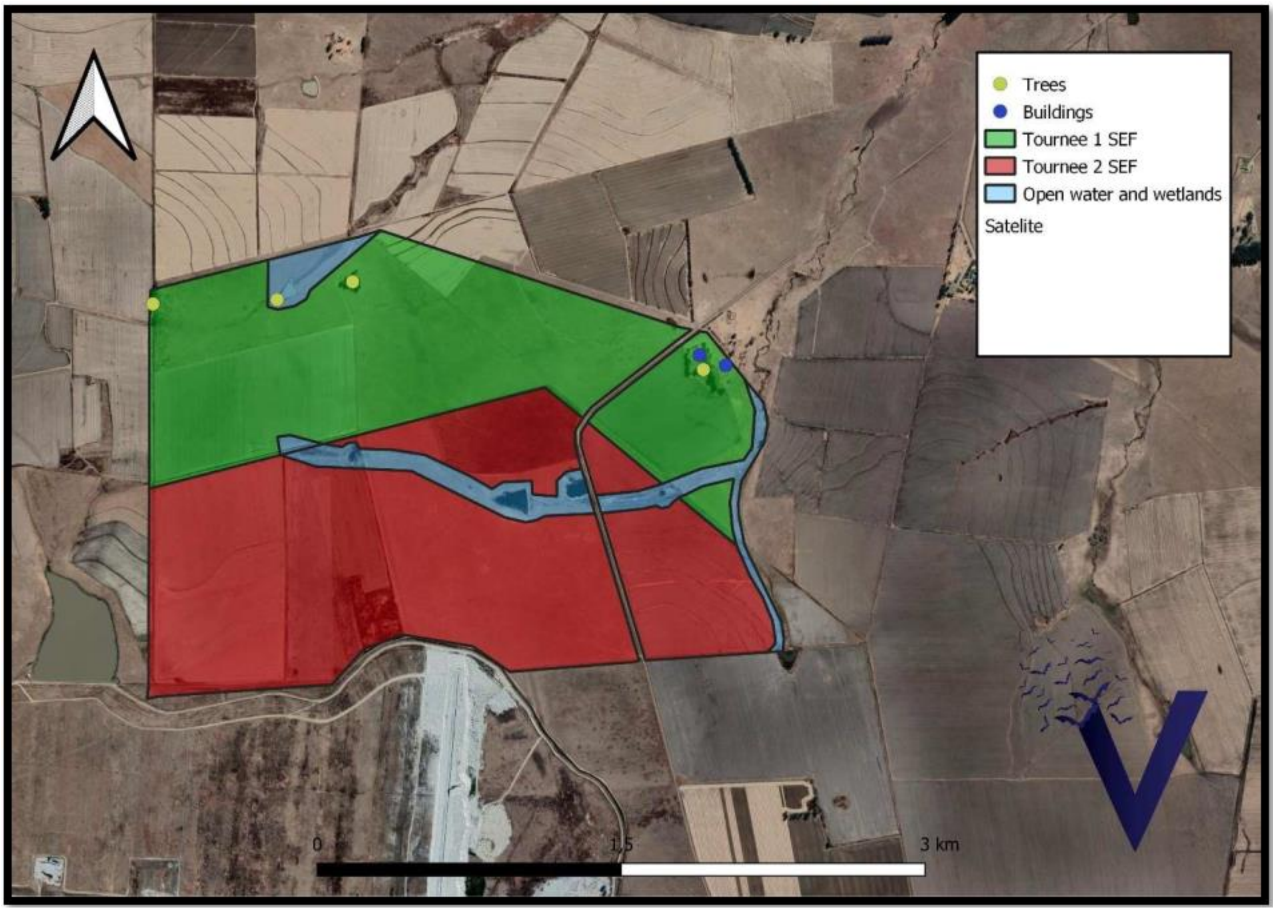


Figure 7-26 – Potential roosts found on the Project area of Influence

Source: Volant, 2023

Figure 7-27 – Buildings that could act as potential bat roosts on the Project area of Influence

Source: Volant, 2023

Figure 7-28 – Patches of exotic trees that could act as roosting locations for bats

Source: Volant, 2023

7.2.6.4 Bat sensitive zones

Several potential bat sensitive areas, including water sources and potential foraging areas, are outlined below. Based the Guidelines of Bat and Wind Energy Facilities a 200 m buffer should implemented around sites that are considered to be of Medium Sensitivity to bats such as water sources (MacEwan et al. 2022). However, these buffers are do not apply to SEFs.

Water sources and foraging areas

Bats are heavily reliant on sources of open water and will visit at least one such source during the course of a night. Several sources of open water were found on the PAOI that are connected with sections of wetlands (**Figure 7-29** and **Figure 7-30**). The sections of wetland between the water sources are predicted to host numerous insects and would qualify as good foraging areas for bats.

However, most these wetlands and sources of open water have already been buffered and as such it expected that there will be minimal impact on bats due to the construction of the proposed Facility.

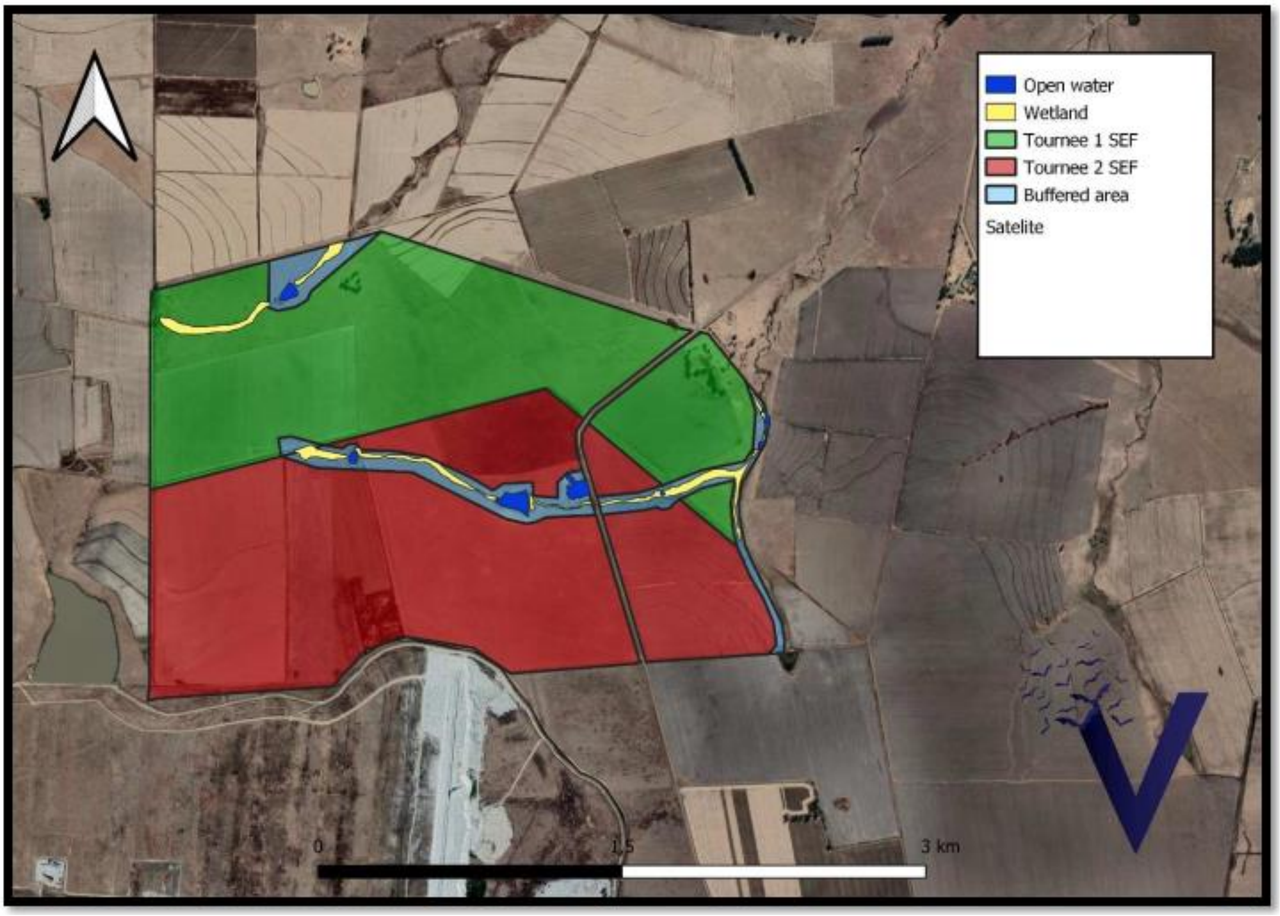


Figure 7-29 – Locations of water sources on the Project Area of Influence

Source: Volant, 2023

Figure 7-30 – Examples of open water on the Project Area of Influence with seepage from one of the dams into the wetland seen in the bottom right

Source: Volant, 2023

7.3 SOCIAL AND ECONOMIC ENVIRONMENT

7.3.1 ARCHAEOLOGICAL AND CULTURAL HERITAGE

*The following is extracted from the Heritage Impact Assessment and Archaeological Specialist Study both compiled by CTS Heritage and included in Appendix 1 of the Heritage Impact Assessment (**Appendix H.8**).*

7.3.1.1 Cultural Landscape

Van Vollenhoven (2015) described the broader assessment area in his assessment completed for a de-stoning plant located near to this proposed development area. Van Vollenhoven (2015) describes the environment as “disturbed by recent human activities, mainly agriculture. This consists of maize fields. Other disturbance visible is mining infrastructure…, a railway track… and power lines... Signs of old fields were also present which could be seen in the pioneer plant species consisting of weeds and grass. Almost half of the surveyed area consists of natural grassland. The vegetation cover varies between short and long grass... The topography of the area forms part of the rolling hills of the surrounding landscape.”

Van Vollenhoven (2015) notes that “At the beginning of the 19th century the Phuthing, a South Sotho group, stayed in the vicinity of modern day Bethal. During the Difaquane they fled to the south (Bergh 1999: 10-11; 109). In 1829 the traveller Robert Scoon passed through an area to the north of Bethal (Bergh 1999: 13). The first white farmers only settled here during the late 1850’s. By the 1890’s this area was inhabited by many white farmers (Bergh 1999:18-20). The town of Standerton was established in 1879 although it already was a district in 1878. Bethal was established in 1880 and it became an independent district in 1898 (Bergh 1999: 20-21). During the Anglo-Transvaal War (1880-1881) the British garrison in Standerton was beleaguered by the Boer forces (Bergh 1999: 46). The Highveld areas also saw much action consisting of various skirmishes between Boer and Brit during the Anglo-Boer War (1899-1902). It includes skirmishes on the farms Oshoek (4 December 1901), Trigaardsfontein (10 December 1901), Witbank (11 January 1902) and Nelspan (26 January 1902) (Bergh 1999: 51, 54)... At Standerton there was both a concentration camp for white and for black people (Bergh 1999: 54).”

Matenga (2022) notes that the neighbouring “Tutuka Power Station was commissioned in 1985. The Power Station and other associated built elements are therefore less than 60 years old, hence below the threshold of recognition in terms of the Heritage Act as industrial heritage of significance. The six cooling towers and two chimneys are iconic structures dominating the landscape and skyline. They represent coal power generating technology of the period from the late 19th century through to the late 20th century.” The proposed facility is relatively small in both its vertical and horizontal dimensions when compared to the Tutuka Power Station. It is dwarfed by the power plant, and as such its impact on the existing landscape is not likely to be significant. However, cognisance must be taken of this unique cultural landscape, consisting of farm werfs in the proposed layout.

7.3.1.2 Archaeology

None of the area proposed for development has been previously assessed in any heritage impact assessment process, however Van Schalkwyk surveyed Farm Spioenkop 376IS in 2002 (SAHRIS NID 5700). Van Schalkwyk (2002) notes that “Although sporadic finds of Stone Age tools have been reported in the larger geographical area, all of these are surface finds, with no known stratified site close by. Some Iron Age sites are also known to exit in the larger area, but none are found close to the study area. Similarly, although some Anglo-Boer War II battlefields occur in the area, and some old farmsteads can be identified on some of the farms, none of these occur in the study area.” Van Schalkwyk (2002) identified no heritage resources of significance in his assessment.

Heritage Impact Assessments have been completed nearby for projects in Secunda and these can be used to infer the archaeological sensitivity in the development area. Van Vollenhoven (2015) notes that the geographical area around the towns of Standerton and Bethal is not known to conserve Stone Age archaeology. He notes that “No such sites are indicated on maps contained in a historical atlas of this area (Bergh 1999: 4-5). However, this may only be since no research has actually been done in this area. The closest known Stone Age occurrences are a Late Stone Age site at the town of Ermelo and rock art sites far to the west of Standerton (Bergh 1999: 4-5).” Van Vollenhoven (2015) noted no natural shelters during the survey; however, the good vegetation in the surrounding area and the rivers indicate that ample grazing and water may have been available, making it a prime spot for hunting in the past. Therefore, one may assume that Stone Age people probably would have moved through the area. Late Iron Age sites are found in a large area around the towns of Bethal and Standerton and number at least 585 such sites.

In the heritage assessment of a powerline upgrade at the nearby Syferfontein Mine, Nel & Karodia (2013), noted that “a heritage assessment was conducted in 2000 by the National Cultural History Museum and included in the Syferfontein Mine EMP in 2010. During the survey, a few Stone Age artefacts were identified. These artefacts were not considered to have any primary context and therefore were interpreted to have low significance value. No Early Iron Age sites were identified. The Late Iron Age sites found here conform to those identified in the literature for the Southern Highveld area (former southern Transvaal, northern Orange Free State) as Type V sites. As the soil is mostly turf, Iron Age settlement usually took place on the various dolerite outcrops. The added benefit of choosing these locations was that it was located at the source of building material used in constructing the settlements. One such site shows interesting features as the living units were actually excavated to obtain enough building material for the surrounding walls. A few of the farmsteads dating to early part of this century were identified as possibly having historical-architectural significance. A number of abandoned homesteads are located in the areas that were investigated. These seem to belong to farm labourers and were all abandoned within the last few years. They are therefore not viewed to be of cultural or historical significance. However, some graves are located in the vicinity of the homesteads and it is possible that more graves will be located nearby”.

CTS Heritage recently completed a field assessment for a proposed facility located approximately 20km away for this development area. This field assessment determined that the area proposed for development has medium to high local historical significance. The broader cultural landscape consists of old farmhouses, kraals, circular stone structures, and the remnants of old water pumps, feeding and watering troughs. Even though the area is rich in history, no significant archaeological heritage resources were identified during the field assessment. No Stone Age or Iron Age heritage resources were identified during the survey. The few heritage resources that were identified consist of the ruins of older farm structures and kraals. However, the field assessment identified six burial grounds or graves.

None of the sites identified in the assessment referenced are located within or near the development area, however the text provides a good assessment of resources that may be present in this study area. It is therefore possible that the proposed development will impact negatively on archaeological resources associated with the Late Iron Age, burial grounds and graves as well as stone age archaeological resources.

7.3.1.3 Identification of Resources

Three observations were made during the field assessment (**Table 7-6**), two of which reflect significant heritage resources. All are described further below. Most areas within the proposed development footprint have been disturbed through cultivation. The dense vegetation and waterlogged areas affected the surface visibility throughout the site. A farmhouse (still in use) is located on portion 6/350. This structure does not appear to have any historical or cultural significance.

The recorded demolished farmhouse likely dates from the late-1960s/1970s (WP 001). According to the farmer, it was demolished by Eskom, probably to discourage illegal occupation. However, no significant cultural material was found by or near the structure. It is, therefore, considered not to have historical or cultural significance. This observation is therefore considered to be Not Conservation-Worthy.

A total of 8 visible stone cairn graves were observed (WP 002). Further, several loose stones were noted approximately 40 m southeast of the confirmed graves (WP 003). Therefore, there is a slight probability that additional (unmarked) graves could be located in this area. However, these stones may also belong to the prominent grave cairns – they could have been displaced due to heavy rainfalls or farming-related activities.

All graves are of high significance, and a minimum of a 50m buffer should be maintained around the extent of the graves. Graves are readily found within the South African rural landscape, and it should be expected that more graves may be in the area of the earmarked development layout. A modern beer bottle was found adjacent to one of the graves.

Table 7-6 – Observations noted during the field assessment

Point ID	Description	Density	Coordinates		Grading	Mitigation
001	Remains of a broken-down farmhouse, c.1960's/70's. No Historical period cultural material and/or features were recorded here. According to the farmer, the structure was demolished by Eskom.	NA	26°45'45.34"S	29°24'50.08"E	NCW	NA
002	Fieldstone cairns located next to the border fence (opposite cultivated lands). Eight visible graves. Some headstones visible but no inscriptions	NA	26°45'13.05"S	29°25'21.84"E	IIIA	Buffer recommended
003	Additional unmarked graves may exist at WP 003. However, the loose stones may be related to the graves at WP 002. Heavy rainfalls and/or farming activities may have displaced the identified cairns.	NA	26°45'13.80"S	29°25'23.15"E	IIIA	Buffer recommended

Source: CTS Heritage, 2023

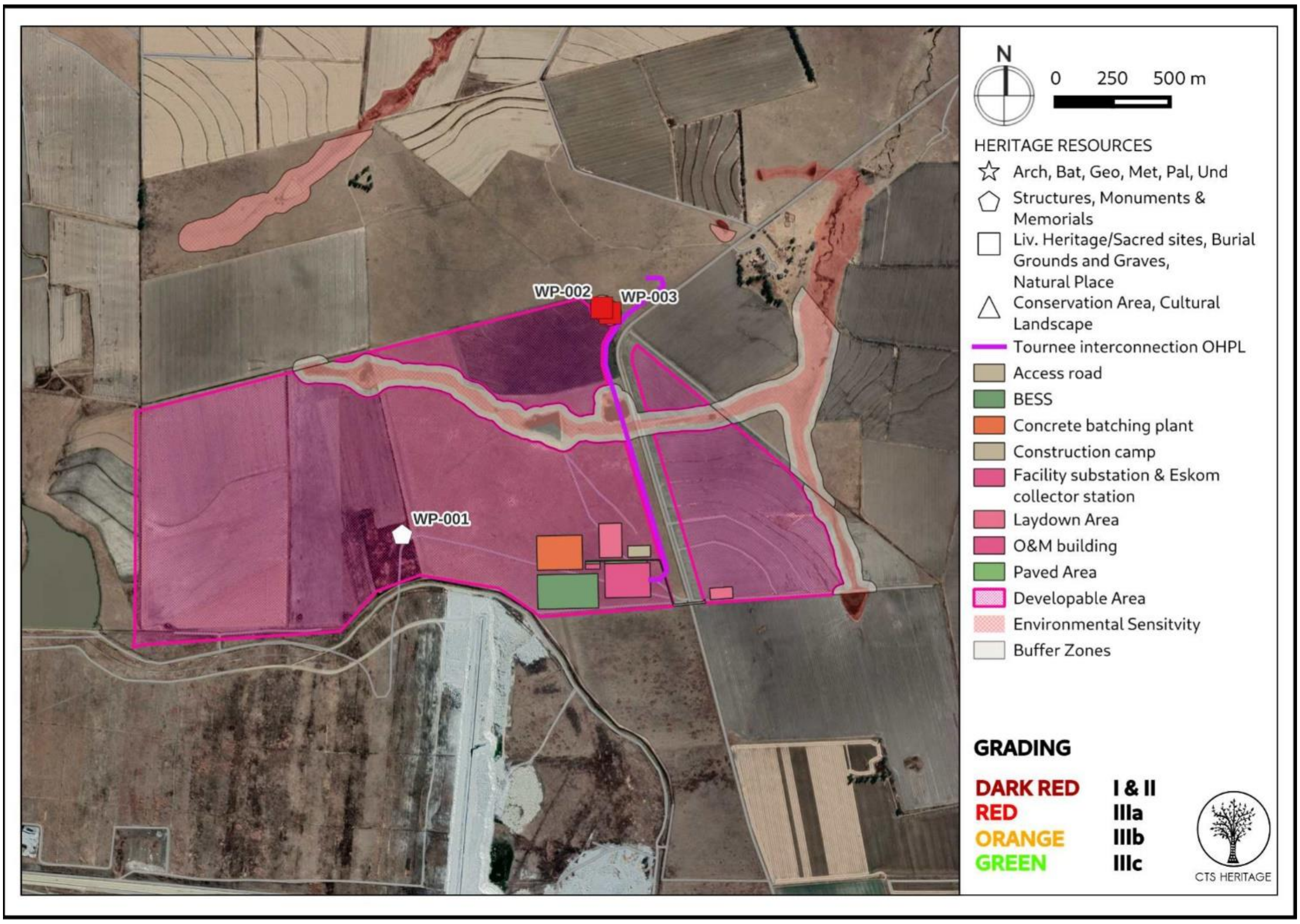


Figure 7-31 – All heritage resources within proximity to the development area

Source: CTS Heritage, 2023

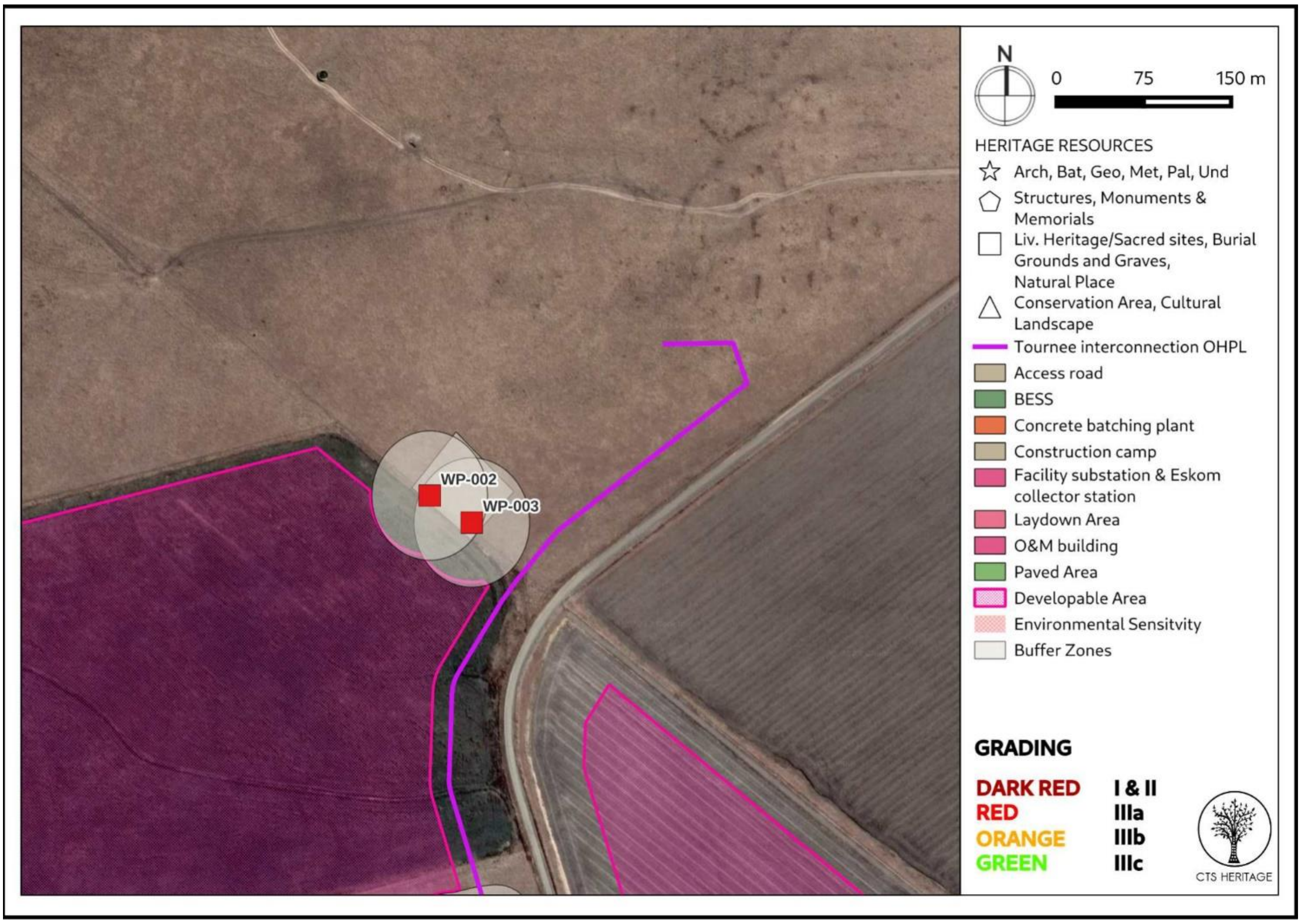


Figure 7-32 – Map of heritage resources identified within the PV development area

Source: CTS Heritage, 2023

7.3.2 PALAEONTOLOGY

*The following is extracted from the Palaeontological Impact Assessment by Prof Marion Bamford and included in Appendix 2 of the Heritage Impact Assessment (**Appendix H.8**).*

The Vryheid Formation lies on the uneven topography of pre-Karoo or Dwyka Group rocks in the northern and north-western margins, but lies directly on the Pietermaritzburg Formation in the central and eastern part. The lithofacies show a number of upward-coarsening cycles, some very thick, and they are essentially deltaic in origin. There are also delta-front deposits, evidence of delta switching, and fluvial deposits with associated meandering rivers, braided streams, back swamps or interfluves and abandoned channels (Cadle et al., 1993; Cairncross, 1990; 2001; Johnson et al., 2006). Coal seams originated where peat swamps developed on broad abandoned alluvial plains, and less commonly in the backswamps or interfluves. Most of the economically important coal seams occur in the fluvial successions (ibid). In the east (Mpumalanga and northern KwaZulu Natal), the Vryheid formation can be subdivided into a lower fluvial-dominated deltaic interval, a middle fluvial interval, and an upper fluvial-dominated deltaic interval again (Taverner-Smith et al., 1988).

The Vryheid Formation preserves the distinctive Gondwanan flora, the Glossopteris flora. As the climate warmed up and the huge continent drifted polewards the land was rapidly colonised by luxuriant vegetation, in some parts. Peats formed in waterlogged environments and over time were buried, preserved and altered by heat and pressure to eventually form the coal seams typical of this formation and abundant in Mpumalanga and KwaZulu Natal coalfields. Coals themselves do not preserve the original plant structures, but plant impressions or compressions can be preserved in the lenses between the coals or in fine grained sediments. The flora is composed of the dominant Glossopteris plants (leaves, seeds, reproductive structures, roots and wood). Other plants are lycopods, sphenophytes, ferns, cordaitaleans and other early gymnosperms. Vertebrates are not found with the fossil plants because they require adifferent set of conditions for preservations. Plants require rapid burial in a reducing and anoxic environment, while bones can be preserved in oxidizing environments (Cowan, 1995).

The Jurassic dolerite does not preserve fossils because it is an intrusive volcanic rock. The very young Quaternary sands along the stream are also very unlikely to preserve fossils as they have been moved by the river floods and fossils would have been destroyed, if present in the first place.

The proposed project area is situated south of Bethal, north of Standerton and west of Morgenson, adjacent to the R38. The land has been cultivated and/or grazed for decades and so is highly disturbed from clearing of the land of rocks for cultivation and ploughing. There are no rocky outcrops within the cultivated land. With a gently rolling topography covered with either secondary grassland or exposed soils after ploughing, the visibility was generally good. Streams were not surveyed for fossils because they are seldom permitted to be developed, but more importantly, water and water-logged areas are not good for the preservation of fossils.

The palaeontologists tracked their route in the vehicle but walked into the veld to observe and take photographs. For both Tournée 1 Solar Facility and Tournée 2 Solar Facility (**Figure 7-33**) the same topography, open grasslands and lack of rocky outcrops were observed. NO FOSSILS of any kind were seen on the ground surface and are unlikely to be found in the overlying soils.

Figure 7-33 – Site photographs for the Tournée 2 Solar Facility

A– D – general view of the farmland showing no rocky outcrops and only a few trees in the far distance.

Source: Bamford, 2023

7.3.3 TRAFFIC

The following is extracted from the Transport Impact Assessment by iWink Consulting (Pty) Ltd and included as ***Appendix H.9.***

7.3.3.1 Surrounding road network

The construction vehicles for the proposed Tournée 2 PV Solar Energy Facility will take access either via the R38 or via the R39 towards the site as described under **Section 7.3.3.3**.

According to the road classification of the surrounding road network as per the Road Infrastructure Strategic Framework for South Africa and COTO's TRH26 South African Road Classification and Access Management Manual, the R38 and R39 can be classified as Class 2 rural major arterials, which typically carries inter-regional traffic between:

- Smaller cities and medium to large towns;
- Smaller border posts;
- Class 1 and Class 2 arterials; and
- Smaller centres when travel distances are very long (i.e., longer than 200 km).

7.3.3.2 Port of Entry

It is envisaged that the components to be imported to South Africa, will arrive either via the Port of Richards Bay or the Port of Durban, as these two ports are the closest to the site.

Port of Richards Bay

The Port of Richards Bay is situated on the coast of KwaZulu-Natal and is a deep-sea water port boasting 13 berths. The terminal handles dry bulk ores, minerals and break-bulk consignments with a draft that easily accommodates Cape size and Panamax vessels. The Port is operated by Transnet National Ports Authority. The Port of Richards Bay is located approximately 490 kms from the proposed Tournée 2 PV Solar site (**Figure 7-34**).

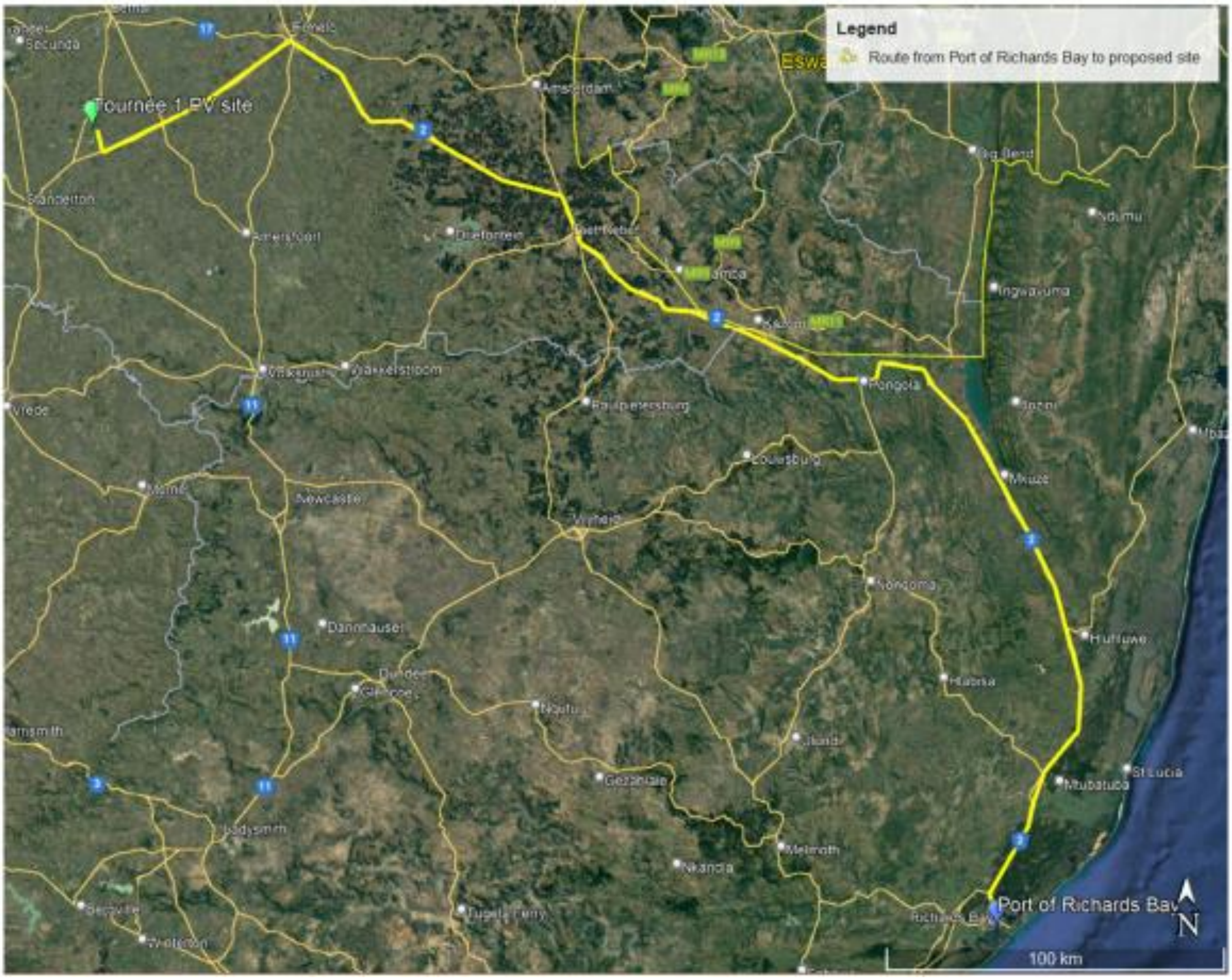


Figure 7-34 – Route from Port of Richards Bay to proposed site

Source: iWink Consulting, 2023

The Port of Durban

The Durban container terminal is one of the largest container terminals in the African continent and operates as two terminals Pier 1 and Pier 2. It is ideally located to serve as a hub for containerized cargo from the Indian Ocean Islands, Middle East, Far East and Australia. Various capacity creation projects are currently underway, including deepening of berths and operational optimization. The terminal currently handles 65% of South Africa's container volumes. (Transnet Port Terminals, n.d).

The Port of Durban is located approximately 510 kms via the N3 from the proposed project site (**Figure 7-35**).

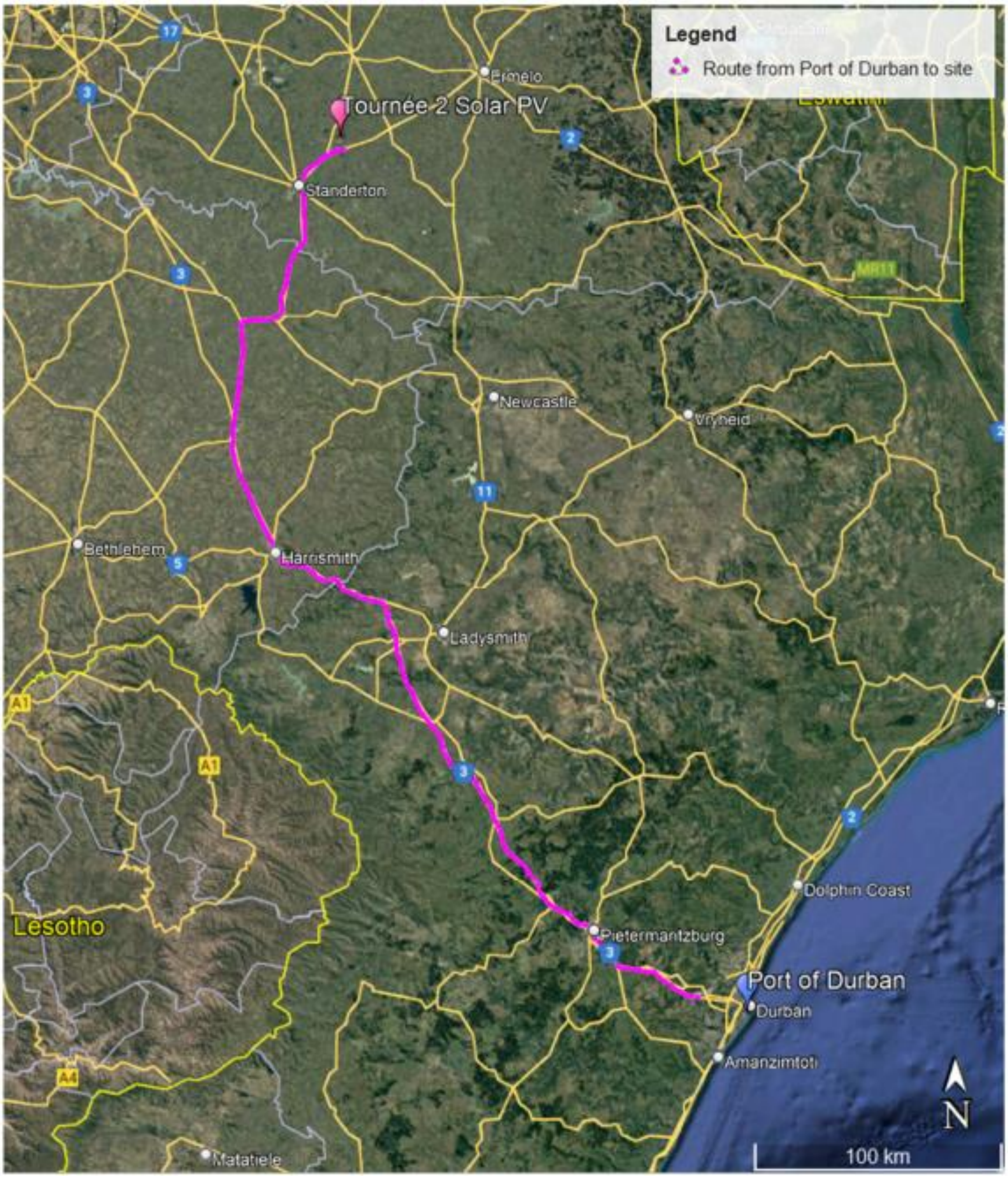


Figure 7-35 – Route from Port of Durban to proposed site

Source: iWink Consulting, 2023

7.3.3.3 Proposed Accesses

Two access points and roads are recommended towards the site – one via the R39 and one via the R38 (Figure **7-36**). Both access roads follow established routes and are partially surfaced and partially gravel surfaced. The accesses have been assessed in line with access spacing requirements, required sight lines and road safety considerations.

The route via Access Point 2 will be slightly longer from the ports of entry and possible manufacturing centres but this access point can function as a secondary access for the proposed development.

Figure 7-36 – Aerial view of proposed access points and roads to proposed site

Source: iWink Consulting, 2023

Access Point 1

The proposed access route from access point 1 is shown in **Figure 7-37**. This access point is well suited from a sight distances point of view.

Figure 7-37 – Existing surfaced access road at Access point 1 towards the proposed site

Source: iWink Consulting, 2023

Access Point 2

The access road from Access point 2 towards the site is shown in **Figure 7-38** and is unsurfaced gravel road. Sight distances are good in both directions at Access point 2. This access route will follow the gravel road and takes a right-turn towards the site. The last section of the access road towards the site will require upgrading due to being partially overgrown and not meeting the minimum road width required for large haulage vehicles.

Figure 7-38 – Distance between Access points 1 and 2

Source: iWink Consulting, 2023

General

The access roads leading from the external roads (R38 and R39) towards the site need to be maintained if damaged by haulage vehicles.

7.3.3.4 Internal Roads

The geometric design and layout for the internal roads from the recommended access points need to be established at detailed design stage. Existing structures and services, such as drainage structures, signage and pipelines will need to be evaluated if impacting on the roads. It needs to be ensured that the gravel sections remain in good condition and will need to be maintained during the additional loading of the construction phase and then reinstated after construction is completed.

The geometric design constraints encountered due to the terrain should be taken into consideration by the geometric designer. Preferably, the internal roads need to be designed with smooth, relatively flat gradients (recommended to be no more than 8%) to allow a larger transport load vehicle to ascend to the respective laydown areas.

Transportation of Materials, Plant and People to the proposed site

It is assumed that the materials, plant, and workers will be sourced from the surrounding towns as far as reasonably possible, such as from Thuthukani.

Public Transport and Non-Motorised Transport

In terms of the National Land Transport Act (NLTA) (Act No.5 of 2009), the assessment of available public transport services is included in this report. The following comments are relevant in respect to the public transport availability for the proposed developments.

It is expected that minibus taxis frequent the R38 and R39, which are located approximately 8 kms and 5 kms from the site. However, the developer of a large-scale project, such as many renewable energy projects, will provide shuttle buses or similar for workers during the construction phase.

7.3.3.5 Transportation requirements

It is anticipated that the following vehicles will access the site during construction:

- Conventional trucks within the freight limitations to transport building material to the site;
- 40ft container trucks transporting solar modules, frames, and the inverter, which are within freight limitations;
- Flatbed trucks transporting the solar modules and frames, which are within the freight limitations;
- Light Differential Vehicle (LDV) type vehicles transporting workers from surrounding areas to site;
- Drilling machines and other required construction machinery being transported by conventional trucks or via self-drive to site; and
- The transformers will be transported as abnormal loads.

7.3.4 VISUAL

*The following is extracted from the Visual Impact Assessment compiled by Scientific Aquatic Services (Pty) Ltd and included as **Appendix H.10.***

7.3.4.1 General views

General views of the landscape associated with the Tournée 2 Solar PV Facility and surrounds with respect to the terrain, vegetation cover (grasses and cultivated fields) and overall character are indicated in **Figure 7-39** and **Figure 7-40**.

Figure 7-39 – General view of the Tournée 2 Solar PV Facility, indicating the cultivated fields

Source: SAS, 2023

Figure 7-40 – General view of the Tournée 2 Solar PV Facility, indicating the ash dam

Source: SAS, 2023

Figure 7-41 – General view of the Tournée 2 Solar PV Facility, indicating the grassland vegetation

Source: SAS, 2023

7.3.4.2 Land Use and Visual Receptors

The Tournée 2 Solar PV Facility is situated in cultivated fields interspersed with open grassland utilised for grazing, and freshwater ecosystems. Due to the dominant land use of the area being agricultural practices, the majority of sensitive receptors located within the visual assessment zone comprised of farmsteads. Since the Tutuka Power Station and the associated ash dump form part of the skyline (i.e. dominant in the landscape) the farmers are used to industrial infrastructure in the landscape, hence the farmsteads are considered moderately sensitive receptors.

According to SAPAD (2022), SACAD (2022) and NPAES (2019) the Tournée 2 Solar PV Facility is not located within a 10 km radius of any protected or conservation areas.

Since the Tournée 2 Solar PV Facility is situated within a relatively remote area, the only roads present within a 5 km radius are farm roads, which are utilised infrequently and predominantly by the farmers and workers and the R38 (2 km west) and R39 (4.4 km south) roadways (**Figure 7-42**). Due to their momentary views and experience of the receiving environment motorists are classified as low sensitive receptors, however glint and glare from any shiny surface may momentarily distract a motorist from the road. Even though SEAs (2019) do not take into account farm roads, it is recommended that some form of buffer be placed on the road traversing the Tournée 2 Solar PV Facility, to ensure the safety of the road users. As such, a 30 m buffer, as a minimum, around the road is recommended, where no solar panels should be placed.

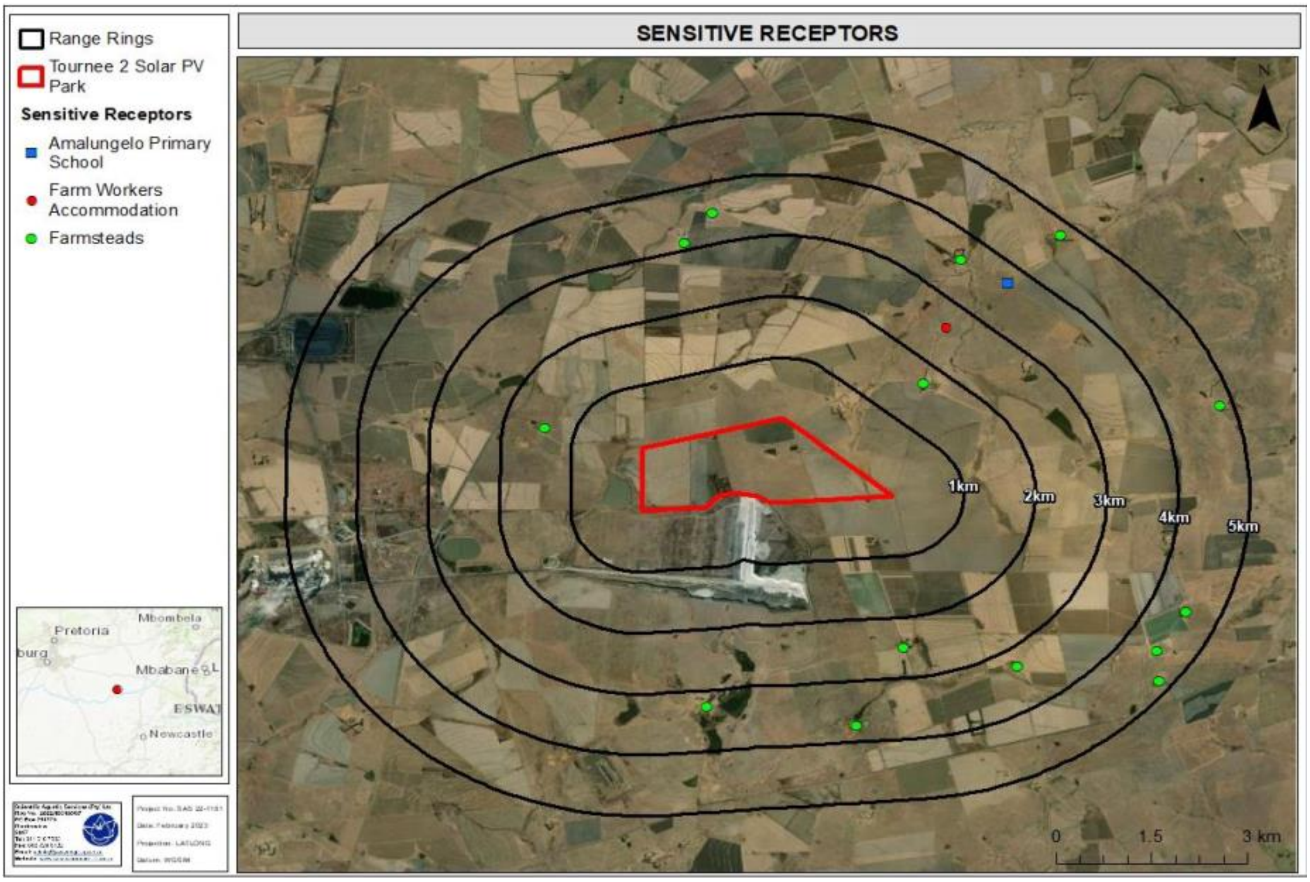


Figure 7-42 – Map indicating the location of potential sensitive receptors within 5km of the Tournée 2 Solar PV Facility

Source: SAS, 2023

7.3.4.3 Landscape Character and Quality

The Tournée 2 Solar PV Facility is located in a rural area forming the landscape character of the Highveld plateau with a colour palette of mostly green with periodic shades of brown (when fields are harvested). The Highveld plateau is relatively widespread, indicating that the landscape character is relatively common. The landscape is considered homogenous in terms of vegetation and colour palette, and the undulating terrain is fairly common in the larger Mpumalanga Province, and with the Tutuka Power Station forming part of the skyline, the scenic quality of the area is considered moderately low.

7.3.4.4 Topography

The local topography of the Tournée 2 Solar PV Facility is relatively flat to gently sloping. With the local topography of the Tournée 2 Solar PV Facility being relatively flat, it is unlikely to assist in absorbing and/ or screening the Tournée 2 Solar PV Facility. The ash dump will however assist in absorbing the Tournée 2 Solar PV Facility. The field assessment did however indicate as distance increases the visibility of Tournée 2 Solar PV Facility decreases, as such the undulating terrain does have an effect on the visibility of the Tournée 2 Solar PV Facility. Please refer to **Figure 7-43** and **Figure 7-44** for the elevation and slope models of the area.

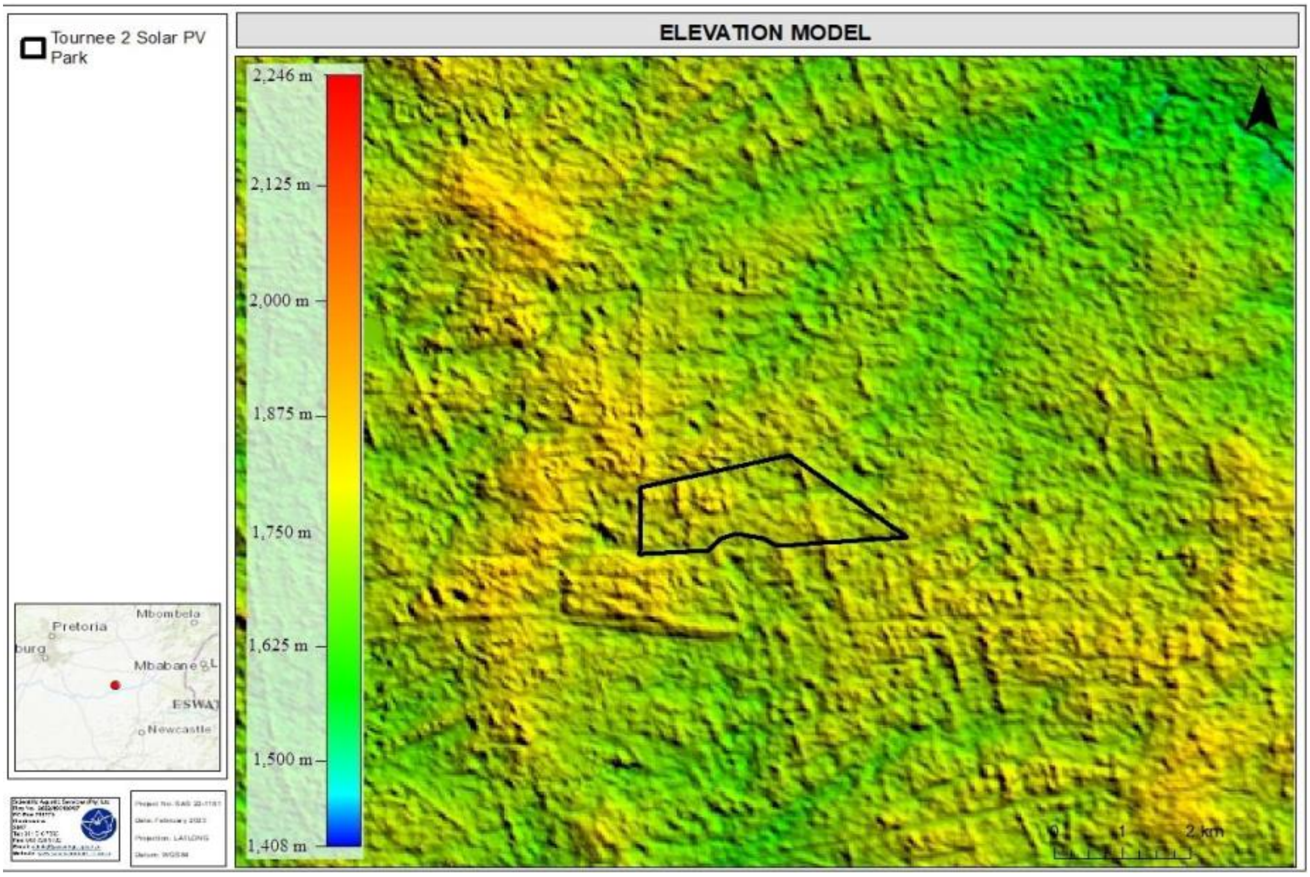


Figure 7-43 – False colour elevation rendering depicting the topographical character of the Tournée 2 Solar PV Facility

Source: SAS, 2023

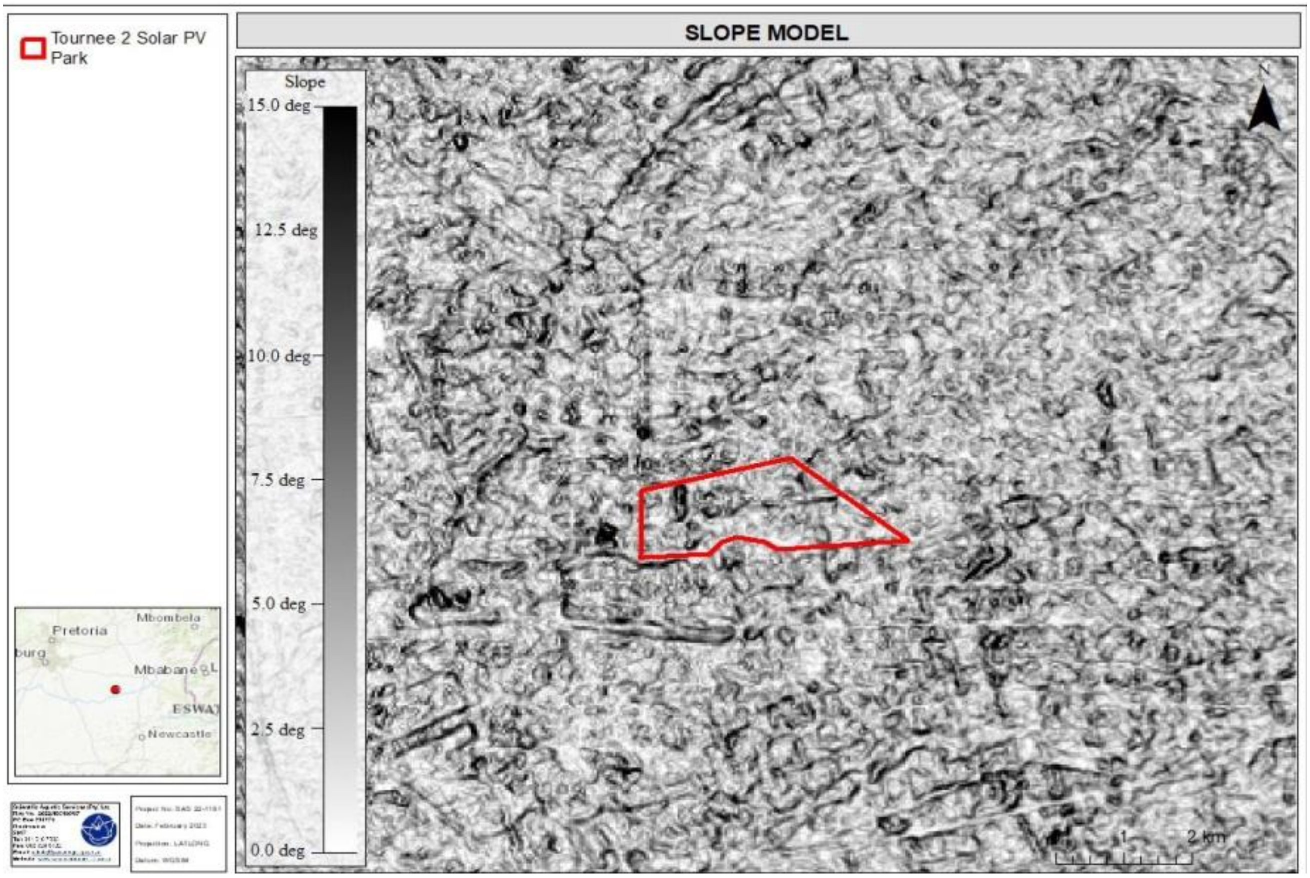


Figure 7-44 – Monochromatic map indicating the general relief associated with the Tournée 2 Solar PV Facility

Source: SAS, 2023

7.3.4.5 Sense of Place

Sense of place is the unique value that is allocated to a specific place or area through the cognitive experience of the user or viewer. It is created by the land use, character and quality of a landscape, as well as by the tangible and intangible value assigned thereto. The sense of place associated with the Tournée 2 Solar PV Facility is related to the landscape character type, defined as rural, relatively flat to gently sloping with limited anthropogenic movement.

The sense of place is however not unique to the Tournée 2 Solar PV Facility as it extends to the larger region. During the construction phase of the Tournée 2 Solar PV Facility, the sense of place will however be affected, shifting the mood to busy and disturbed with construction vehicles and potential need for some earth moving equipment, however, once the panels are operational there will be limited additional vehicular movement in and out of the area, thus returning the area to a calm and tranquil landscape.

7.3.4.6 Night-Time Lighting

The Tournée 2 Solar PV Facility is located in a rural area where the only sources of lighting are the farmsteads and Thutuka Power Station. The lighting environment of the region is therefore considered rural (Zone E2 [Low District Brightness]). Development of the Tournée 2 Solar PV Facility may potentially be a source of light pollution during the construction and operational phases, due to security lighting on the perimeter fence and at the buildings (substation, BESS and O&M Buildings) and temporary construction camps. Overall, the impact significance of potential night-time lighting is expected to be moderately low and will be limited to a local area, as the Tournée 2 Solar PV Facility is not a development that requires a significant amount of lighting. This corresponds with Bortle's Scale – indicating that Tournée 2 Solar PV Facility falls within a Class 4 area (rural/suburban transition) where the light pollution is low and distant large objects are distinct. As such the introduction of lighting sources in an area with low light pollution results in the Tournée 2 Solar PV Facility to somewhat contribute to the effects of sky glow and artificial lighting in the region. It should however be noted that the undulating topography will reduce the range of visibility of the proposed lighting from the Tournée 2 Solar PV Facility.

7.3.5 GLINT AND GLARE CONSIDERATION

PV panels are designed to generate electricity by absorbing the rays of the sun and are therefore constructed of dark-coloured materials and are covered by anti-reflective coatings. Indications are that as little as 2% of the incoming sunlight is reflected from the surface of modern PV panels especially where the incidence angle (angle of incoming light) is smaller i.e. the panel is facing the sun directly (LOGIS, 2021). This is particularly true for tracker arrays that are designed to track the sun and keep the incidence angle as low as possible (LOGIS, 2021).

Glint and glare occur when the sun reflects off surfaces with specular (mirror-like) properties, which include glass windows, water bodies and potentially some solar energy generation technologies (e.g. CSP heliostats and parabolic troughs). Glint is generally of shorter duration and can be described as "a momentary flash of bright light", whilst glare is the reflection of bright light for a longer duration. Glint and glare may impair the visibility of observers and cause annoyance, discomfort, or loss in visual performance.

Literature review indicates glint and glare is only likely experienced when the observer is at a higher elevation than the proposed solar PV panels and depends on the degree to which is the panels are tilted. For example, the glint and glare from tracking panels with back tracking towards ground-based receptors are most common when the panels are flat in the morning/evening (LOGIS, 2021). This is when the larger incidence angle (angle of incoming light) yields more reflected light.

The visual impact associated with glint and glare relates to the potential it has to negatively affect sensitive receptors in relative close proximity to the source, or aviation safety risk for pilots (especially where the source interferes with the approach angle to the runway). There are several farmsteads located within a 5 km radius, however only two farmsteads and one farm worker's accommodation are located within a 2 km radius. Based on elevation data, the farmstead located 1,3 km west of the Tournée 1 Solar PV Park is located at a slightly higher elevation, indicating that the farmers might be at risk of experiencing possible glint and glare.

The field assessment and digital satellite imagery further indicates that there are cultivated fields situated between the farmstead and Tournée 1 Solar PV Park, which acts as visual screens, at least for most of the year, resulting in a lowered quantum of risk for experiencing glint and glare. The elevation data further indicates the farmstead located 1,7 km north north-east and the farm workers' accommodation located 2.5 km north north-east of the Tournée 1 Solar PV Park is situated at a slightly lower elevation, as such the farmer and farm workers would not experience a reflection due to the 0° tilt (lying flat) of the panels in the mornings.

The observers would theoretically be looking at the base (underside) or edge of the panels. Based on elevation data, the gravel road traversing the Tournée 2 Solar PV Facility is at a slightly higher elevation than the proposed PV arrays located to the east and at a lower elevation than the proposed PV arrays located to the west, as such the farmers traveling along the gravel road is likely to experience less reflection of the PV arrays located west than those located east of the gravel road.

7.3.6 AVIATION CONSIDERATION

The Federal Aviation Administration (FAA) of the United States of America have researched glare as a hazard for aviation pilots on final approach and may prescribe specific glint and glare studies for solar energy facilities in close proximity to aerodromes (airports, airfields, military airbases, etc.). It is generally possible to mitigate the potential glint and glare impacts through the design and careful placement of the infrastructure. According to the DWS Screening Tool's Civil Aviation Theme, the western portion of Tournée 2 Solar PV Facility is situated within 8 km of a civil aviation aerodrome and the remainder of the site is located between 8 and 15 km of another civil aviation aerodrome. The airstrip of the Tutuka Power Station Airfield – FATT is located approximately 6,3 km west of the Tournée 2 Solar PV Facility. Airstrips with the runway situated on an east to west axis and located at an angle of less than 30 degrees to the north and 20 degrees to the south in the southern hemisphere from a proposed PVSEF are invariably at a higher risk of experiencing glint and glare, due to the airstrip being orientated at an angle that would lead to reflection toward the runway. The abovementioned airstrip axis is orientated at a north north-east to south south-west direction, which puts the airstrip at a significantly lower risk to glint and glare impacts when landing and on take-off from features in the landscape.

The Tournée 2 Solar PV Facility is located at an angle between 60˚ and 65˚ to the runway axis, depending on the position within the Tournée 2 Solar PV Facility**. Figure 7-45** below provides an illustration of the bearings from the airstrip to the Tournée 2 Solar PV Facility. Line 1 is the direction of the airstrip which is at a bearing of 18.28˚, the angle of incidence of line 2 is at a bearing of 81.08˚, indicating that the airstrip is at a 62.8˚ from the Tournée 2 Solar PV Facility. Line 3 is at bearing of 80.02˚, indicating that the airstrip is at an angle of 61.74˚ from the Tournée 2 Solar PV Facility. From the above, the risk of glint and glare on the Tutuka Power Station Airfield – FATT is reduced considerably. Should there be risk of glint and glare, it will be most significant in the mornings and in winter months when the sun rises further to the north. Should glint and glare be experienced, this could be mitigated with a simple go-around of the aircraft and landing in the opposite direction which should be possible in the early morning when winds are generally at a lower speed and direction of landing is not a significant factor. Solar PV systems can safely coexist in area where aerodromes are located, provided that mitigation measures are undertaken, such as utilising anti-reflection coating on the PV modules, texturing the PV module surface and/ or varying the alignment of the PV array (Sreenath *et al*., 2020). Should additional mitigatory measures be deemed necessary solar panels with this technology can be utilised.

The intensity of the light reflected from the solar panels decrease with increasing distance and is directly proportional to the size of the PV array, which in this case is a relatively big 150 MW installation.

Figure 7-45 – Map illustrating the angle of incidence between the Tutuka Power Station Airfield – FATT and Tournée 2 Solar PV Facility, for illustrative purposes.

7.3.7 SOCIAL

*The following is extracted from the Social Assessment Report compiled by Tony Barbour Environmental Consulting and included as **Appendix H.11.***

7.3.7.1 Administrative Context

The study area is located within the Lekwa Local Municipality (LLM) within the Mpumalanga Province. The LLM is one of the seven Local Municipalities that make up the Gert Sibande District Municipality (GSDM) (**Figure 7-46**). The town of Standerton is the administrative seat of the LLM.

Figure 7-46 – Location of Lekwa Municipality within the Gert Sibande District Municipality

Source: Tony Barbour, 2023

7.3.7.2 Demographic Overview

Population

The population of the LLM in 2016 was 123 418 (Community Household Survey 2016). Of this total, 33.4% were under the age of 18, 61.1% were between 18 and 64, and the remaining 5.6% were 65 and older. The figures or the percentage of the population falling within the economically active economic age category of 18-64 were higher than the figures for the GSDM and Mpumalanga (57.7% and 56.6% respectively). This is likely to be due to the employment opportunities associated with the mining and manufacturing activities in the LLM. The population of Ward 12 (Census 2011) was 8 405, of which 36.2% were under the age of 18, 59.6% were in the active economic category (18-64) and 4.2% were older than 64.

The dependency ratio is the ratio of non-economically active dependents (usually people younger than 15 or older than 64) to the working age population group (15-64). The higher the dependency ratio the larger the percentage of the population dependent on the economically active age group. This in turn translates to reduced revenue for local authorities to meet the growing demand for services. The traditional approach is based people younger than 15 or older than 64. The information provided provides information for the age group under 18. The total number of people falling within this age group will therefore be higher than the 0-15 age group. However, most people between the age of 15 and 17 are not economically active (i.e., they are likely to be at school).

Using information on people under the age of 18 is therefore likely to represent a more accurate reflection of the dependency ratio. Based on these figures, the dependency ratios for the LLM, the GSDM and Mpumalanga in 2016 were 63.8%, 73.5% and 77% respectively. The lower dependency ratios in the LLM reflect the employment and economic opportunities in mining and power sector. The dependency ratio for Ward 12 (2011) was 67.8%.

In terms of race groups, Black Africans made up 85.5% of the population on the LLM, followed by Whites, 13% and Indian or Asian (1.2%) (**Table 7-7**). The main first language spoken in the LLM was isizulu, 56.6%, followed by Sesotho (22.7%) and Afrikaans (12.9%).

In Ward 12 Black Africans made up 90.2% of the population, followed by Whites, 9.6% and Indian or Asian (0.1%). The main first language spoken was isizulu, 70.1%, followed by Afrikaans (9.7%) and Sesotho (7.3%).

Table 7-7 - Population group LLM

Column	LLM		GSDM		Mpumalanga	
Black African	89.2%	110,072	91.6%	1,040,425	93.6%	4,057,760
Coloured	1.8%	2,234	0.8%	9,429	0.8%	32,859
Indian or Asian	0.8%	993	0.7%	8,126	0.5%	19,786
White	8.2%	10,119	6.8%	77,429	5.2%	225,558

Source: Wazimap: 2016 Household Community Survey

Households and house types

The total number of households in the LLM in 2016 was 37 335, which ~ 10% of the total number of households in the GSDM. Of these 63.1% were formal houses, 19.1% were shacks, and 10% were flats in backyards. The figures for the GSDM were 67.2%, 13.4%, 6.7% and 8.3% respectively. While the majority of dwellings in the LLM are formal structures there are a high percentage of informal structures which reflects the migration of jobseekers to the area and the pressure this in turn places on housing. The figures for Ward 12 were 60% (formal house) and 16.9% (shack).

In terms of ownership, 58.7% of the dwellings in the LLM were owned and fully paid off, while 5.6% were in the process of being paid off. 12.2% were occupied rent free and 15.2% of the dwellings were rented from private individuals. A relatively large percentage of the properties in the LM (64.4%) were owned and or in the process of being paid off. This reflects a relatively stable and established community.

In terms of household heads, approximately 36.8% of the households in the LLM and 39.1% of the households in the GSDM were headed by women. These figures similar to the provincial figure of 39.71%. The high percentage of households headed by women in the LLM reflects the likelihood that the men have left the area in search of employment opportunities in Gauteng. This is despite the well-developed mining and energy sector in the LLM. Women headed households tend to be more vulnerable. The figure for Ward 12 was 21.4%, which is considerably lower that the LLM and GSDM.

Household income

Based on the data from the 2011 Census, 10.8% of the population of the LLM had no formal income, 3.9% earned less than R 4 800, 5.9% earned between R 5 000 and R 10 000 per annum, 17.8% between R 10 000 and R 20 000 per annum and 22.3% between R 20 000 and 40 000 per annum (2016). The figures for Ward 12 were 6.7%, 2.7%, 3.4%, 17.3% and 26.5% respectively.

The poverty gap indicator produced by the World Bank Development Research Group measures poverty using information from household per capita income/consumption. This indicator illustrates the average shortfall of the total population from the poverty line. This measurement is used to reflect the intensity of poverty, which is based on living on less than R3 200 per month for an average sized household (~ 40 000 per annum). Based on this measure, in the region of 60.7% of the households in the LLM and 65.2% in the GSDM live close to or below the poverty line. The figure for Ward 12 was 56.6%.

The low-income levels in the LLM and GSDM reflect the limited formal employment opportunities outside the urban areas. This is also reflected in the high unemployment rates. The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the LLM. This in turn impacts on the ability of the LM to maintain and provide services.

Household income levels are likely to have been impacted by the COVID-19 pandemic. The number of households in the LLM and GSDM that live close to or below the poverty line is likely to have increased over the last 18 months. This, coupled with the high dependency ratio, is a major cause of concern for the area.

Employment

The official unemployment rate in the LM in 2016 was 15.5%, while 44.4% were employed, and 36.7% were regarded as not economically active (**Table 7-8**). However, the COVID-19 pandemic is likely to have resulted in an increase in unemployment rates in the LLM. Recent figures released by Stats South Africa also indicate that South Africa's unemployment rate is in the region of 36%, the highest formal unemployment rate in the world.

Table 7-8 - Employment LM

Column	LLM		GSDM		Mpumalanga	
Discouraged work-seeker	3.4%	2,600	5.3%	35,518	5.8%	150,844
Employed	44.4%	34,118	38.9%	259,129	37.5%	969,771
Other not economically active	36.7%	28,171	39.4%	262,387	39.4%	1,020,806
Unemployed	15.5%	11,895	16.5%	109,658	17.3%	448,126
Unspecified	0%	0	0%	0	0%	0

Source: Wazimap: 2016 Household Community Survey

Education

In terms of education levels, the percentage of the population over 20 years of age in the LLM with no schooling was 9.3% in 2016, compared to 10.8% and 11.3% for the GSDM and Mpumalanga Province respectively (**Table 7-9**). The percentage of the population over the age of 20 with matric in the LLM (2016) was 30.6%, compared to 34.3% and 36.1% for the GSDM and Mpumalanga. The education levels in the LLM are therefore lower than the GSDM and Provincial figures. The figures for Ward 12 (2011) were 22.7% (no education) and 21.4% (matric). The education levels in Ward 12 are therefore lower than the LLM, GSDM and province.

Table 7-9 - Population by highest educational level LM

Column	LLM		GSDM		Mpumalanga	
None	9.3%	7,495	10.8%	74,575	11.3%	289,024
Other	0.2%	122	0.4%	2,692	0.5%	13,008
Some primary	11.1%	8,914	10.3%	71,150	9.2%	235,202
Primary	4.7%	3,817	3.7%	25,654	3.6%	93,209
Some secondary	37%	29,835	32.7%	225,668	31.6%	807,658
Grade 12 (Matric)	30.6%	24,653	34.3%	236,452	36.1%	923,581
Undergrad	2.1%	1,725	2.6%	18,141	2.6%	65,572
Post-grad	1.9%	1,555	2.6%	17,873	2.6%	67,379
N/A	3%	2,434	2.5%	17,310	2.5%	64,704

Source: Wazimap: 2016 Household Community Survey

7.3.7.3 Municipal Services

Electricity

Based on 2016 survey, 92.1% of households in the LLM had access to electricity, compared to 90.4% for the GSDM and 93.2% for Mpumalanga. In terms of connections, 84.3% has in-house prepaid meters, while 6.2% had traditional meters (**Table 7-10**).

Table 7-10 - Population by electricity access

Column	LLM		GSDM		Mpumalanga	
In-house prepaid meter	84.3%	103,987	76.1%	863,819	81.4%	3,531,211
No access to electricity	7.9%	9,742	9.6%	108,857	6.8%	294,078
In-house conventional meter	6.2%	7,601	12.8%	145,050	9.6%	416,614
Other source (not paying for)	1.1%	1,350	0.3%	3,412	0.8%	35,088
Other	0.6%	738	1.3%	14,272	1.4%	58,972

Source: Wazimap: 2016 Household Community Survey

Access to water

Based on the 2016 survey information, 88.6% of households in the LLM were supplied by a regional or local service provider. This compares to 88.4% and 86.85% for the GSDM and Mpumalanga respectively. Of this total 46.3% had piped water inside the house and 42.3% in the yard (**Table 7-**

11). The relatively high percentage that relied on piped water in their yards reflects the relatively high percentage of shacks (19.1%) in the LLM.

Table 7-11 - Population by water source

Column	LLM		GSDM		Mpumalanga	
Piped water inside house	46.3%	57,127	33.6%	381,982	27.9%	1,210,646
Piped water inside yard	42.3%	52,240	49.2%	558,314	45.7%	1,980,179
Borehole outside yard	3.7%	4,594	3%	33,521	2.1%	90,998
Public/communal tap	1.8%	2,196	3%	33,872	5.1%	220,698
Other	5.9%	7,262	11.3%	127,721	19.2%	833,444

Source: Wazimap: 2016 Household Community Survey

Sanitation

85.6% of the households in the LLM had access to flush toilets (2016), while 10% relied on pit toilets and 2.5% had not access to sanitation (**Table 7-12**). The figures with no access to sanitation are similar to the 2.6% and 2.8% for the GSDM and Mpumalanga respectively. The relatively high percentage of households that relied on pit toilets reflects the relatively high percentage of shacks (19.1%) in the LLM. The figure for flush toilets is higher than the figures for the GSDM (65.3%) and Mpumalanga (42.1%) respectively.

Table 7-12 - Population by toilet facilities

Column	LLM		GSDM		Mpumalanga	
Flush toilet	85.9%	106,071	65.3%	741,197	42.1%	1,824,153
Pit toilet	10%	12,294	26.4%	299,583	47.5%	2,058,092
None	2.5%	3,120	2.6%	29,216	2.8%	119,896
Other	0.6%	789	3.6%	40,923	3%	128,618

Source: Wazimap: 2016 Household Community Survey

Refuse collection

66.5% of the households in the LLM had access to regular refuse removal service, while for 13.6% relied on their own dump (**Table 7-13**). The relatively high percentage that relied on their own dump reflects the relatively high percentage of shacks (19.1%) in the LLM. The figure for regular service is higher than the 52.2% for the GSDM.

Table 7-13 - Population by refuse disposal

Column	LLM		GSDM		Mpumalanga	
Service provider (regularly)	66.5%	82,069	52.2%	592,992	36.9%	1,598,974

Column	LLM		GSDM		Mpumalanga	
Own dump	13.6%	16,804	26.8%	303,917	47.4%	2,054,914
None	12.5%	15,411	7.1%	80,341	6%	260,346
Communal dump	5.8%	7,162	4.2%	48,114	4.2%	183,389
Other	1.6%	1,971	9.7%	110,045	5.5%	238,341

Source: Wazimap: 2016 Household Community Survey

7.3.7.4 Overview Of Study Area

The study area is located approximately 26km to the north-east of the town of Standerton in the LLM and 35km south-west of the town of Secunda in the adjacent Govan Mbeki Municipality. Standerton is the largest urban settlement in the LLM and serves as the administrative and institutional hub of the municipality. It is a typical medium sized South African town, with a central CBD, industrial areas on the periphery, low density residential development and separation between white and black and rich and poor neighbourhoods.

Secunda has its origins in the 1973/74 international oil crisis when the then South African Government took the decision to establish a second coal liquefaction plant following the establishment of the first at Sasolburg in the 1950s. After the site for the Sasol complex had been identified, it had to be decided whether or not to combine the existing towns of Evander and Trichardt. The huge burden that extensions of this nature would have had on the financial and administrative resources of the established communities as well as the tempo at which such development should proceed was decisive and resulted in the decision to develop Trichardt and Secunda to be one town, named Secunda. Evander, located ~ 8km to the west of the current day Secunda, remained a separate town. Trichardt borders onto the northern part of Secunda. The first town area was proclaimed in June 1976. The name Secunda is derived from the from the Latin, secundi meaning second/following, and was given to the town as it was the second extraction refinery producing oil from coal, after Sasolburg, which is located approximately 140km west of Secunda. The town was located adjacent to the large coalfields in the area, including the Evander and Winkelhaak coal mines located to the north west of the town. The Secunda facility consists of Sasol Two (1980) and Sasol Three (1982) is the largest coal liquefaction plant in the world, and produces synthetic fuel, diesel, and related fuels and petrochemicals from coal gasification. The Secunda facility is located to the south of the town (**Figure 7-47**).

Figure 7-47 – Secunda Sasol Facility

Source: Tony Barbour, 2023

The Thukuka Power station and Thuthukani settlement are located 4 and 10km to the west of the site respectively (**Figure 7-49** and **Figure 7-49**). Thuthukani started as a worker's village to house employees of the Thuthuka power station which is located 4 km to the east of the village. The IDP notes that Thuthukani is made up of two townships namely Thuthukani proper and Thuthukani Extension 1 as well as Eskom Hostels to the west of town. The IDP indicates that because Thuthukani is solely dependent on Thuthuka Power Station and the associated New Denmark Colliery the growth potential is limited. The New Denmark Colliery is located ~6km to the north west of the Thuthuka Power station. The ash dump for the power station is located immediately to the south of the PV SEF site.

The other land uses in the study area commercial agriculture. Commercial agriculture in the study area includes livestock and grain farming. Based on the Google Earth information there are a limited number of farmsteads in the study area. As indicated in **Figure 7-48**, the farmsteads are located to the north of the site (yellow place marks). The Visual Impact Assessment (Aquatic Environmental Services, July 2023) notes that most of the farmsteads have existing dense tree lines which partially or completely obscure the view towards Tournée 2 and 1 Solar PV SEFs. The Tutuka ash dump also shields the PV SEFs from receptors located to the south and north.

An Eskom substation is located 5 km to the southwest of the site. The social environment can therefore be described is a working agricultural / industrial environment. There are no tourist related activities located in the study area. Therefore, from a social perspective there are a limited number of sensitive social receptors.

Figure 7-48 – Location of Tournée SEFs relative to Tukuka Power Station and Thuthukani settlement to the west (Tournée 2, green arrow, Tournée 1, red arrow)

Source: Tony Barbour, 2023

Figure 7-49 – Tukuka Power Station

Source: Tony Barbour, 2023

Figure 7-50 – Location of Tournée 2 with ash dump to the south

Source: Tony Barbour, 2023

7.4 HEALTH AND SAFETY FOR BATTERY ENERGY STORAGE SYSTEMS

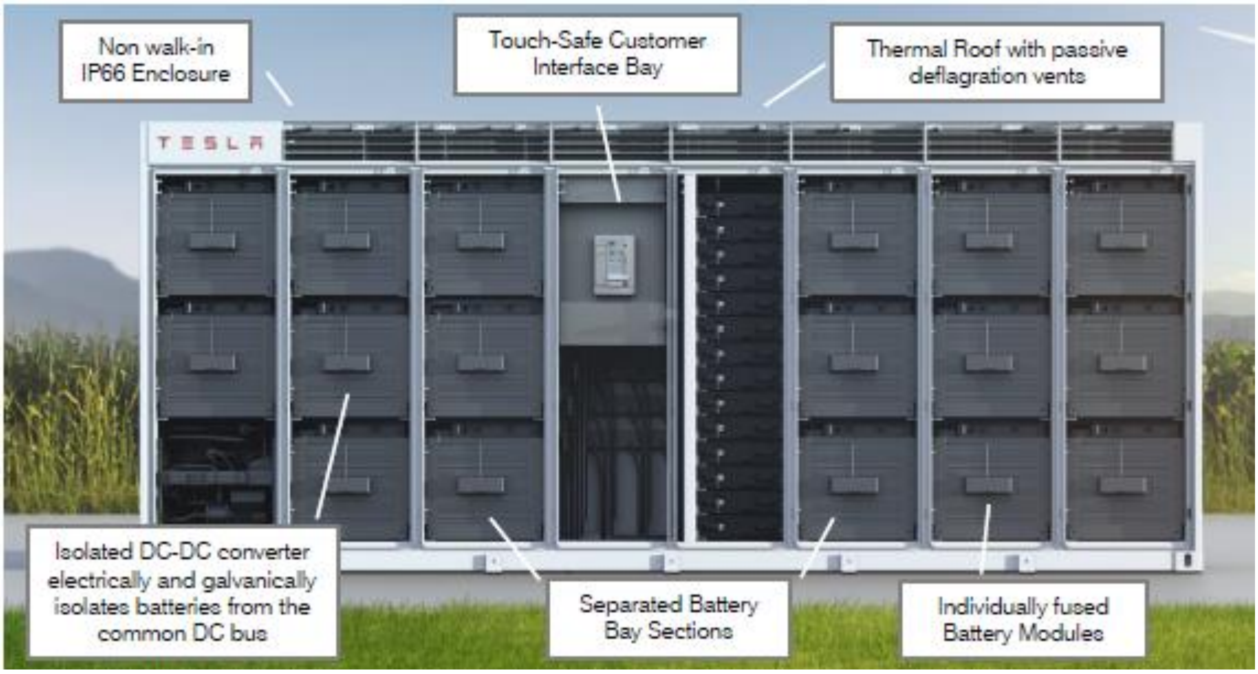
*The following is extracted from the High Level Safety Health and Environmental Risk Assessment compiled by iSHEcon and included as **Appendix H.13.***

7.4.1 PLANT AND PROCESSES

7.4.1.1 Proposed Design Lithium Solid State Batteries

The type of battery technology being considered for each BESS would be a Solid-State Battery which consists of multiple battery cells that are assembled together to form modules. Each cell contains a positive electrode, a negative electrode and an electrolyte. The BESS will comprise of multiple battery units or modules housed in shipping containers and/or an applicable housing structure which is delivered pre-assembled to the project site. Containers are usually raised slightly off the ground and layout out is rows. They can be stacked if required although this may increase the risk of events in one container spreading to another container. Supplementary infrastructure and equipment may include substations, power cables, transformers, power converters, substation buildings and offices, HV/MV switch gear, inverters and temperature control equipment that may be positioned between the battery containers. The solid-state batteries that are being considered are Lithium-ion systems. The pictures in **Figure 7-51** are typical BESS installations servicing solar power farms. **Figure 7-52** and **Figure 7-53** show typical battery modules in the BESS facility.

Figure 7-51 – Images of Typical BESS Systems Servicing Solar Power Farms



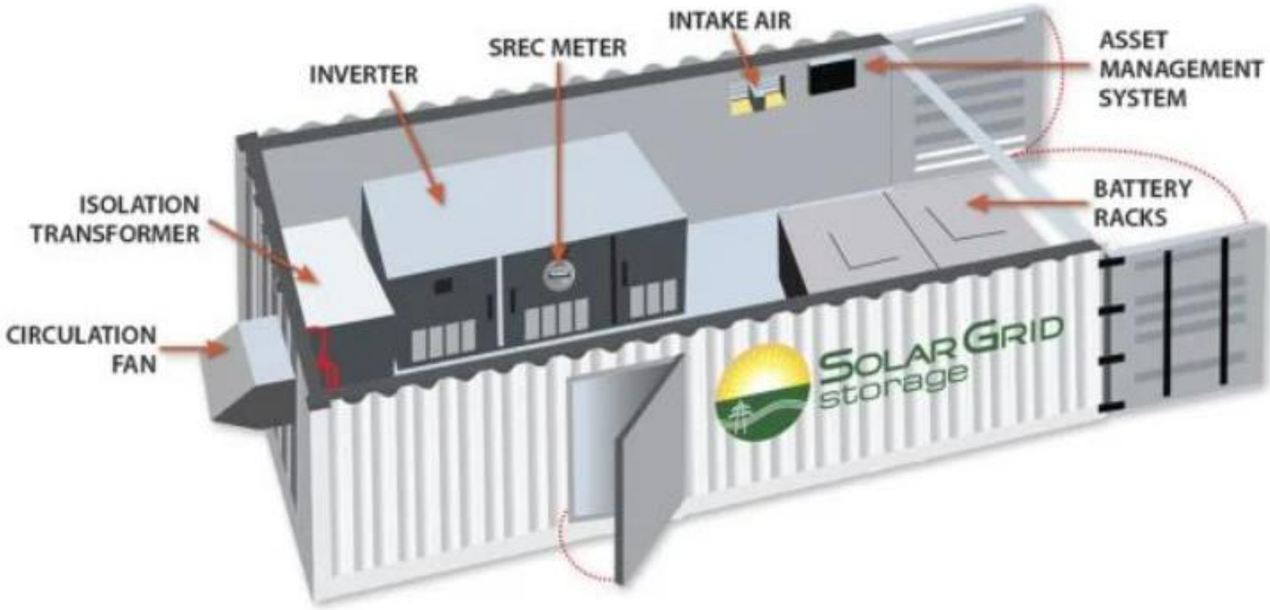


Figure 7-52 – Typical Battery Modules in a BESS with the Separated Sections

Source: Tesla MegaPack – Safety Overview

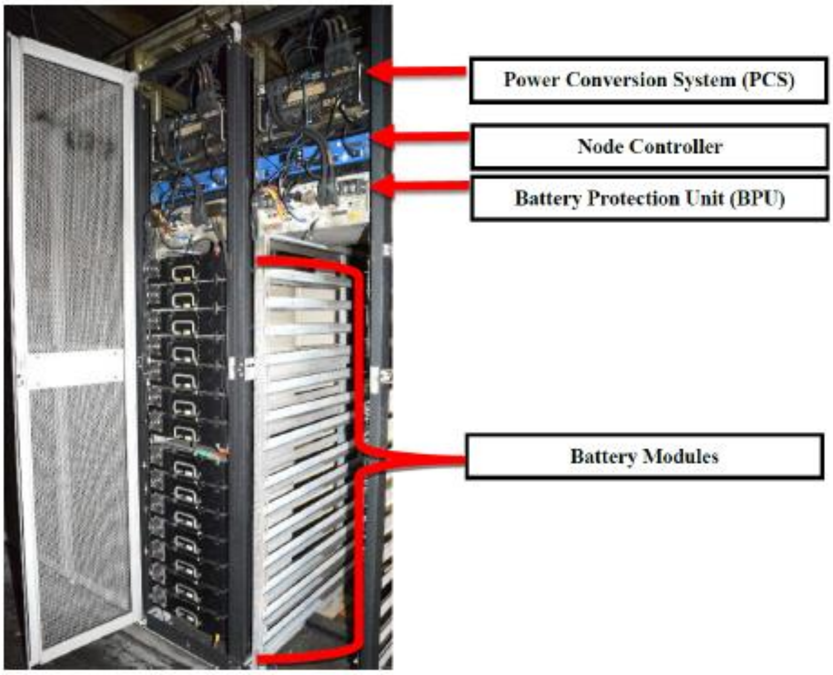


Figure 7-53 – Typical Battery Modules in a BESS with the Power Conversion Systems in with the Batteries

Source: DNV-GL McMicken Event Analysis

7.4.1.2 Staff and Shift Arrangement

The BESS will run 7 days a week for 24 hours a day. Although the system will be largely automated with a battery management system and electronic operator interface etc., it will still require attention from operators and maintenance staff. The facility will need routine checking / preventative and breakdown maintenance / grass cutting / security etc. During normal operations there are assumed to be approximately 10 persons on site during the day depending on the activities taking place and possibly one or two operators as well as security personnel at night.

7.4.1.3 Operations at the Bess Facility and Phases of the Bess Project

The BESS facilities can be considered to have three main phases:

- Construction including transport to site and storage prior to installation,
- Operation including commissioning, maintenance, shutdown – restart,
- Decommissioning including repurposing and disposal.

7.4.2 HAZARD IDENTIFICATION

7.4.2.1 Solid State Lithium Battery Chemical Hazards

Batteries In General

One of the battery types being considered by the project proponent is lithium-ion based solid state batteries.

Lithium-ion based battery systems are becoming one of the dominant technologies for utility systems in Europe and America. For this reason, this assessment assumes that lithium-based batteries will be used in the BESS facilities. Should sodium-based batteries be used, the hazards are likely to be similar at a high level but different in their details, and therefore the RA may need to be reviewed.

Primary (non-rechargeable) batteries use lithium metal anodes. Lithium is one of the lightest and most reactive metallic elements and is highly reactive towards water and oxygen. Exposure of lithium metal to water even as humidity can decompose exothermically to produce flammable hydrogen gas and heat. These lithium metal batteries are not used in BESS systems. However, if secondary batteries discussed below are charged at temperatures below 0 °C, then lithium can plate out onto the anode surface and in this manner lithium metal could be present even in lithium-ion batteries.

Secondary, rechargeable lithium batteries, as used in bulk BESSs, use cathodes that contain lithium in the crystal structure of the cathode coating and/or lithium salts in an electrolyte that is in the battery. These are called lithium -ion batteries. Lithium-ion batteries operate at room temperature and have significant limitations outside the 0 – 50 °C range. The exact lithium-ion composition of the batteries can vary with suppliers. In addition, the technology allows for many combinations of chemistry to suit the particular application.

Lithium Battery Chemistry

The lithium in the batteries is usually in the form of lithium salts dissolved in an electrolyte solution that is absorbed within the electrodes and/or lithium plated onto the surface of the electrode. These are referred to as solid state batteries because electrolyte liquid is not freely available in a form that can easily leak or be extracted. The electrolytes are typically ethylene carbonate or di-ethyl carbonate. The flash points of these carbonates can vary from 18 – 145 °C which means they can be highly flammable (FP < 60 °C) or merely combustible if involved in an external fire (FP > 60 °C). Some of the lithium compound in the electrolyte include lithium hexafluorophosphate, lithium perchlorate, lithium cobalt oxide etc.

Hazard - Thermal Decomposition

Upon heating of the contents of a battery due to shorting, contaminants, external heat or exposure to water and reaction heat, the lithium salts in batteries begin to break down exothermically to release either oxygen (oxidants) that enhances combustion, possibly leading to explosion, or fumes such as hydrogen fluoride or chlorine that are toxic.

These exothermic break down reactions are self-sustaining above a certain temperature (typically 70 °C) and can lead to thermal run away. In this process the battery gets hotter and hotter, the decomposition reactions happen faster and faster and excessive hot fumes are generated in the battery. Eventually the pressure in the battery builds up to the point where those gases need to vented, usually via the weakest point in the system. These vented fumes can be flammable due to vaporization of the electrolyte and can ignite as a flash fire or fire ball (if large amounts) leading to the fire spreading to any surrounding combustible materials, e.g., plastic insulation on cables, the electrolyte, the electrodes and possibly even the plastic parts of the battery casing etc. If the vented flammable vapours do not ignite immediately, they can accumulate within the surrounding structures. If this flammable mixture is ignited later, e.g., due to a spark, this can lead to a violent explosion of the module, cabinet, room, container etc.

In addition to being flammable the vented gases will contain toxic components. These could include the:

- Products of combustion such as carbon dioxide/monoxide, hydrogen cyanide,
- VOCs like benzene and ethylene, and
- Decomposition products such as hydrogen fluoride, hydrogen chloride, phosphorous pentafluoride, phosphoryl fluoride and oxides of aluminium, cobalt, copper etc.

The temperature in the batteries and of these vented gases can be extremely high, e.g., > 600 °C.

In the situation where oxygen is released internally as part of the decomposition (e.g., lithium perchlorate) the oxygen is available to react with the combustible electrolyte and if all this happens extremely fast in a self-sustaining manner within the confines of the device, an explosion of the device can occur with only localized impacts.

Hazard - Propagation

A BESS is composed of individual batteries which are combined into different size packs such as modules and racks, as illustrated in **Figure 7-54**.

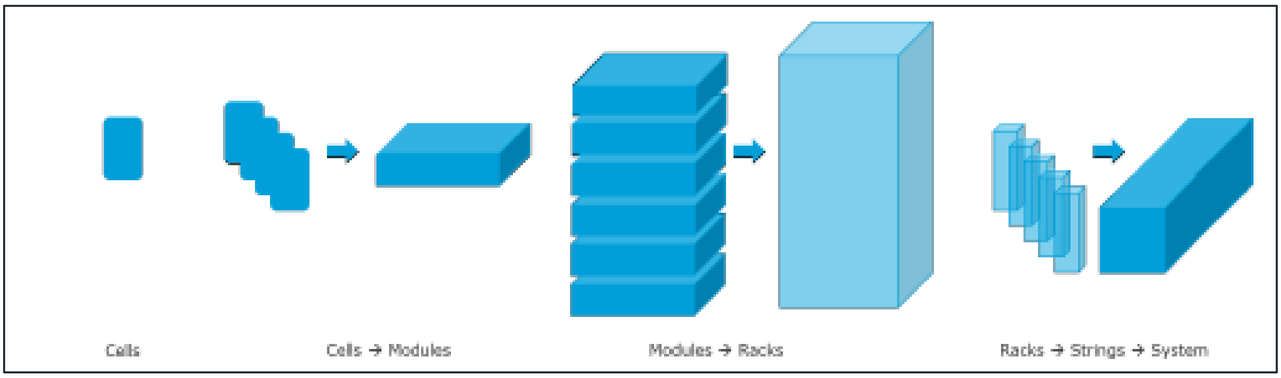


Figure 7-54 – Modules and Racks in a BESS

Source: DNV-GL McMicken Event Analysis

The very high temperature generated by one battery cell in thermal run away could lead to overheating of adjacent cells. This cell in turn then starts thermal decomposition and so the process propagates through the entire system, as illustrated in **Figure 7-55**.

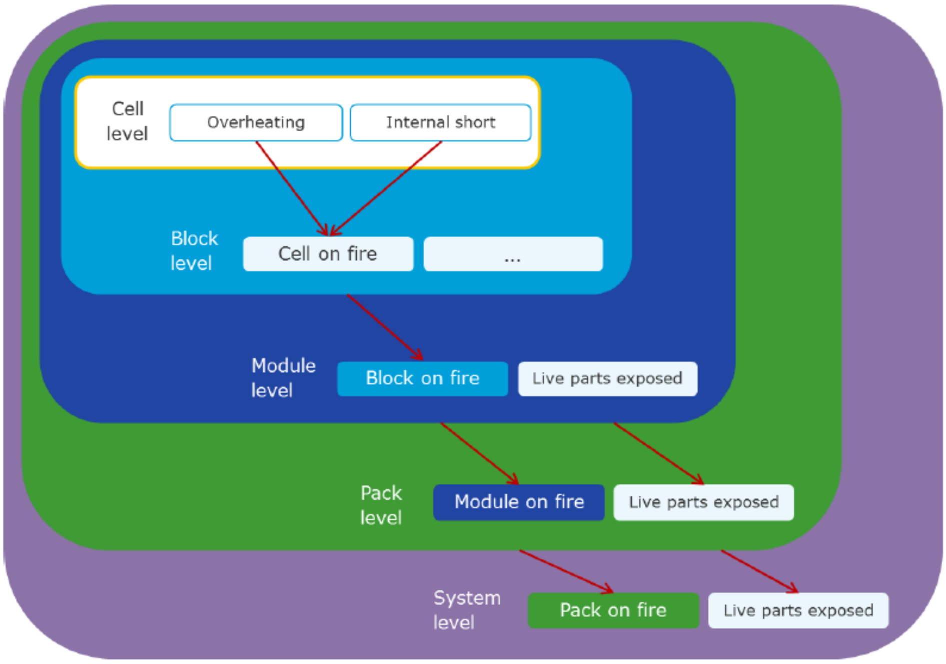


Figure 7-55 – Thermal decomposition

Source: STALLION Report 2015

In order to prevent propagation, there are separation requirements between cells, modules etc. Separation could be with physical space or insulating materials etc.

Hazard - Electrolyte Leaks

Although extremely unlikely due to the structure of the batteries, should electrolyte liquid leak out of the batteries, it can be potentially flammable as well as corrosive etc. If ignited as fire, or explosion, the smoke would contain toxic components. If unignited it can still be extremely harmful especially if its decomposition products include hydrofluoric acid.

7.4.2.2 Other Chemicals or Hazards

The BESS is composed not only of the batteries, but also electrical connections, switches, power converters, cooling systems etc. **Figure 7-56** below shows a typical complex system for a lithium solid state facility.

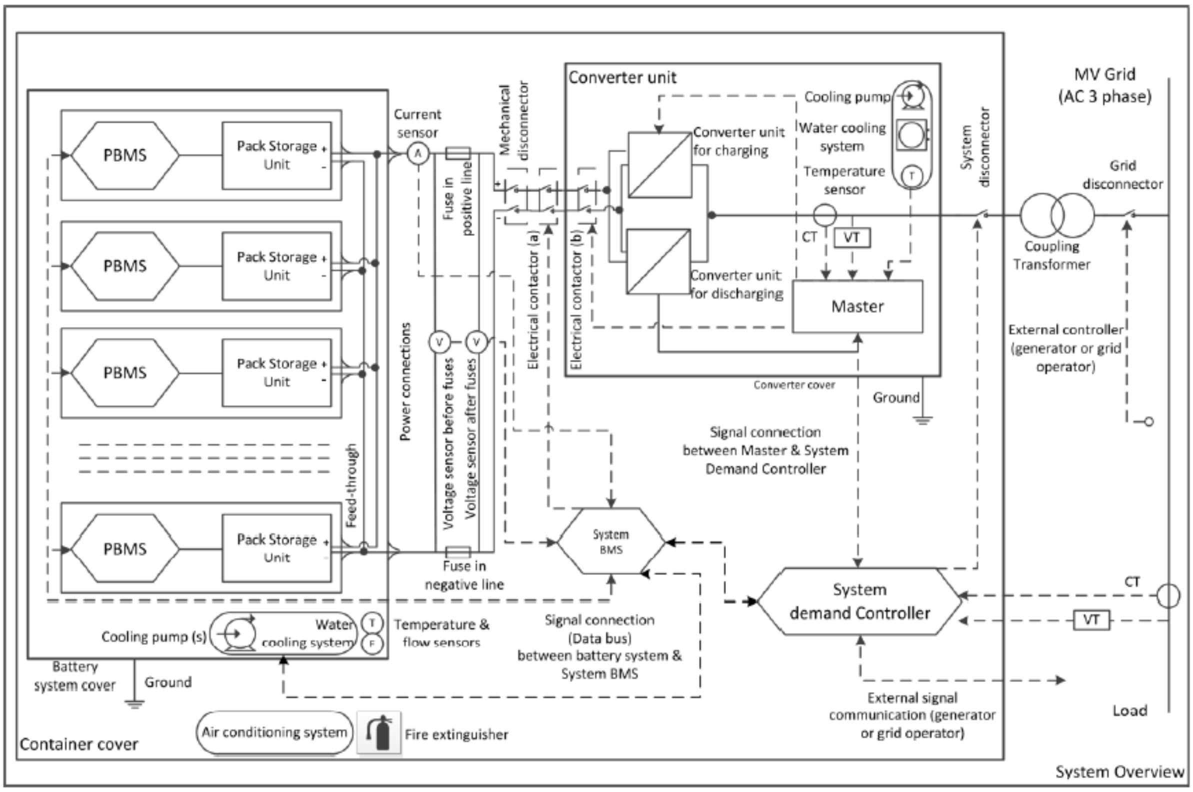


Figure 7-56 – Typical complex system for a lithium solid state facility

Source: STALLION Report 2015

Cooling Systems

Due to the need to keep the batteries within a specified temperature range most of the containerized modular system have built-in air-conditioning systems while the VRFB building systems may have cooling water systems. Some have only fans for air cooling with filters to remove dust prior to cooling. Others, particularly those in hot environments requiring more cooling, may have refrigerant-based systems. These would have a refrigerant circuit usually containing non-flammable non-toxic refrigerant such as R134A (simple asphyxiant) etc as well as a low hazard circulating medium such as an ethylene glycol-based coolant. At high temperatures above 250 °C R134A may decompose and may generate hydrogen fluoride and other toxic gases. Ethylene glycol is really only harmful if swallowed. In the environment it breaks down quickly and at low concentrations that would typically occur from occasional small spills, it has no toxicity.

Fire Suppression Systems

Although these are only effective for some fire scenarios, some of the solid-state containerized systems come fitted with “Clean agent” fire suppressant systems. These are pressurized containers of powder/gases that are released into the container to snuff a fire and do not leave a residue on the equipment. Some containers have water sprinkler systems installed to quench thermal run-away reactions.

In general fire fighters respond to fire outbreaks with water cannons/hydrants, foam systems etc. Such responses may generate large amount of contaminated and hazardous water runoff. A system, to contain as much of this as possible should be in place. This could be a simple trench and small earth mound on the down-slope side of the entire installation.

General Electrical and Electronic Equipment

Whatever the configuration of the battery containers/ buildings there will be electrical and electronic equipment in the battery compartment, the battery building as well as outside. In some installations the main electrical equipment such as the power conversion system is in a separate compartment separated by a fire wall. In others it can be in a separate container.

Wherever there is electrical equipment there is a possibility of shorting and overheating and fire.

8 SITE SENSITIVITY AND VERIFICATION

Specialist assessments were conducted in accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes, which were promulgated in Government Notice No. 320 of 20 March 2020 and in Government Notice No. 1150 of 30 October 2020 (i.e., "the Protocols"), or Appendix 6 of the EIA Regulations, depending on which legislation apply to the assessment under consideration. A summary of the DFFE screening tool, the applicable legislation as well as the specialist sensitivity verification are detailed in **Table 8-1** below. The site verification process is discussed in **Section 8** below.

Table 8-1 - Assessment Protocols and Site Sensitivity Verifications

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
Agricultural Compliance Statement	*Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more*	High Sensitivity	High, Medium and Low Sensitivity
Aquatic Biodiversity Impact Assessment	*Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity*	Very High Sensitivity	Majority of the development site (study area) is of low sensitivity whilst the identified freshwater ecosystems is of high aquatic biodiversity sensitivity
Terrestrial Biodiversity Impact Assessment	*Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity*	Very High Sensitivity	Low Sensitivity
Plant Species	*Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species*	Medium Sensitivity	Low Sensitivity
Animal Species	*Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species*	Medium Sensitivity	Medium Sensitivity
Avifauna Impact	*Protocol for the Specialist Assessment*	Low Sensitivity	Low Sensitivity

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
Assessment	*and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species*		
Archaeological and Cultural Heritage Impact Assessment	*Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed*	Low Sensitivity	Medium Sensitivity
Palaeontology Impact Assessment	*Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed*	Very High Sensitivity	Medium Sensitivity
Visual (Landscape) Impact Assessment	*Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed*	Very High Sensitivity	Low Sensitivity
Civil Aviation Assessment	*Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed*	Medium Sensitivity	Low Sensitivity
Defence Assessment	*Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed*	Low Sensitivity	Low Sensitivity
RFI Assessment	*Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed*	Medium Sensitivity	Low Sensitivity

8.1 ENVIRONMENTAL SENSITIVITIES

8.1.1 AGRICULTURAL SENSITIVITY

The output of the DFFE Screening Tool for the Agricultural Theme is illustrated in **Figure 8-4** and indicates that the site is classified as High Sensitivity.

The site verified results for the agricultural sensitivity considered the occurring soils as well as the current land uses particularly land uses contribution to the agricultural production spectrum. Upon verification the site sensitivity ranged between low and high. Areas under active cultivation were targeted as these are the areas where the impact will mostly be felt. The sensitivity classes were as follows:

- Cultivated land with Maize and Soybeans –Moderately High
- Grazing land – Intermediate
- Watercourses – Low

Figure 8-2 below depicts the agricultural sensitivity.

Figure 8-1 - Map of Agriculture Sensitivity

Source: DFFE Screening Report

The screening tool analysis was conducted, which presented the findings as the impact on agricultural resources being of a high sensitivity in terms of agricultural potential. Based on the outcomes of the field assessment this was found to be of a less significance impact as presented on the screening tool due to the dominant soil forms which are not high potential agricultural soils due to various limitations which include high clay content and susceptibility to water logging.

Based on the precautionary principle the high sensitivity class can be considered valid on the basis that the study area is largely under active cultivation and grazing, however a more accurate sensitivity class would be “Moderately High”. The yield potential for maize and soybeans is considered adequate to contribute to the local and regional food production in a meaningful manner.

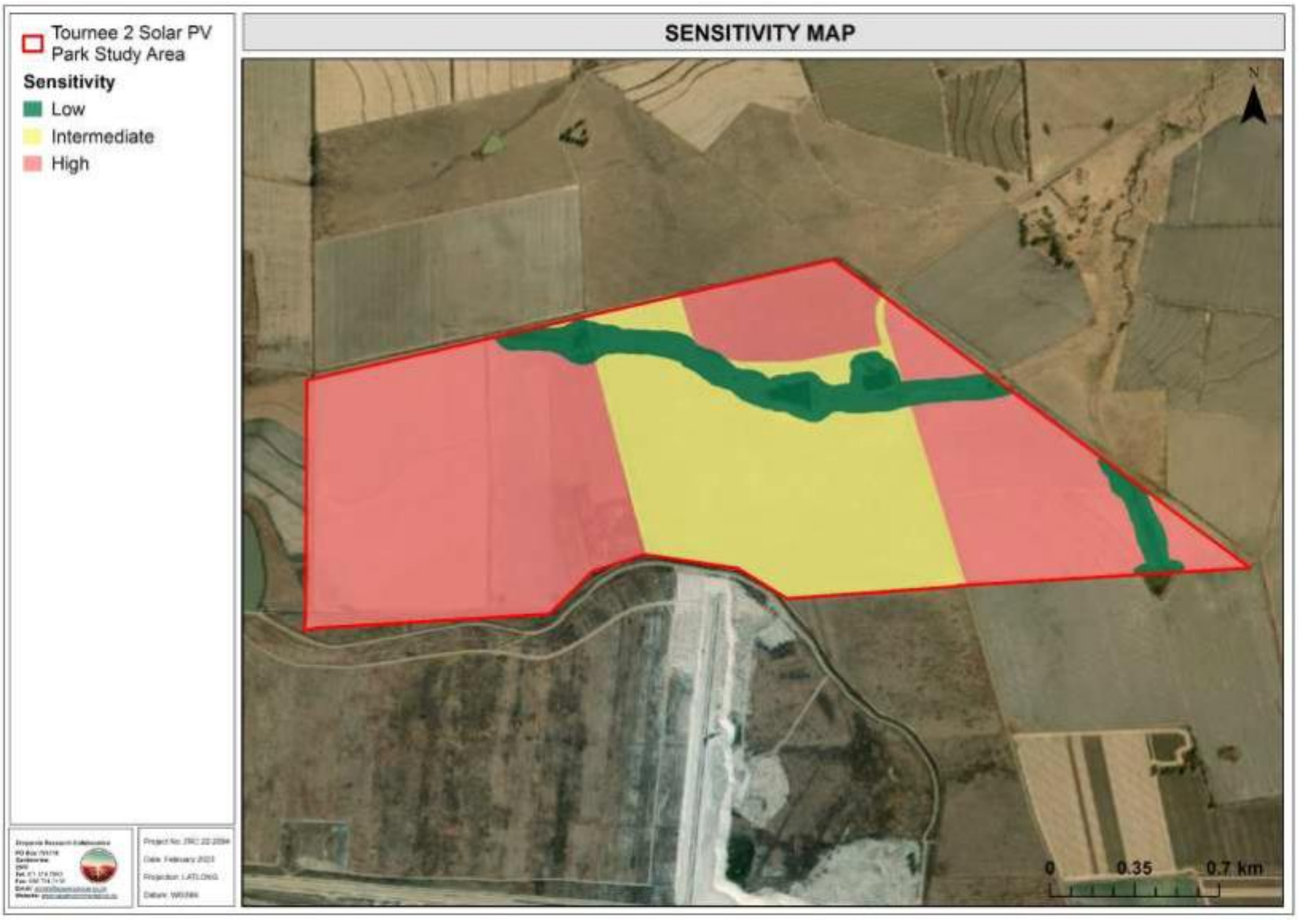


Figure 8-2 - Agricultural sensitivity associated with the Tournée 2 Solar PV Facility

Source: ZRC, 2023

8.1.2 AQUATIC BIODIVERSITY

The output of the DFFE Screening Tool for the Aquatic Biodiversity Theme is illustrated in **Figure 8-3** and indicates that the site is classified as Very High Sensitivity. These areas of very high sensitivity relate to the presence of wetlands. During the assessment and associated field verification undertaken by the specialist it was determined that the majority of the development site (study area) is of low sensitivity whilst the identified freshwater ecosystems is of high aquatic biodiversity sensitivity.

Figure 8-3 - Map of Aquatic Biodiversity Sensitivity

Source: DFFE Screening Report

According to the MBSP Freshwater database (2019), the wetlands indicated by the NFEPA (2011), NBA (2018) and MPHW (2019) databases are indicated as Ecological Support Areas (ESA). ESAs are areas that are not essential for meeting targets, but that play an important role in supporting the functioning of CBAs and that deliver important ecosystem services.

The database does not indicate any parts of the proposed Tournée 2 Solar PV Facility and its associated investigation area as Critical Biodiversity Areas (CBA).

The majority of the proposed Tournée 2 Solar PV Facility is indicated as Other Natural Areas (ONA). ONAs are areas that have been identified as a priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructural functions.

The remaining portions of the proposed Tournée 2 Solar PV Facility and associated investigation area are identified as Heavily Modified areas. These are areas in which significant or complete loss of natural habitat and ecological functioning has taken place which is largely due to agricultural activities within the area.

The proposed Tournée 2 Solar PV Facility and associated infrastructure has been acceptably designed to optimally avoid the CVB wetland and the associated NEMA 32m ZoR, which is deemed the minimum mitigation measure to minimise potential impacts on the wetland. As such, a low degree of modification is anticipated from the construction and operation of the proposed Tournée 2

Solar PV Facility as no development is proposed within the delineated extent of the CVB wetland or within the associated NEMA 32m Zone of Regulation of the wetland.

8.1.3 TERRESTRIAL BIODIVERSITY

The output of the DFFE Screening Tool for the Terrestrial Biodiversity Theme is illustrated in **Figure 8-4** and indicates that the site is classified as Very High Sensitivity.

Figure 8-4 - Map of Terrestrial Biodiversity Sensitivity

Source: DFFE Screening Report

The very high sensitivity was triggered by the presence of an Optimal CBA area and VU ecosystem. During the site assessment, the area associated with the CBA was not confirmed to be representative for the targets set for a CBA as these areas were transformed by current cultivation areas. The remaining Grassland habitat is no longer considered to be representative of the reference VU ecosystem (namely, Soweto Highveld Grassland). This is as a result of the underrepresentation of certain dominant species (e.g., *Themeda triandra*, which was encountered on site but in a very low abundance and restricted distribution with the Tournée 2 Solar PV Facility), found in Soweto Highveld Grassland vegetation type and the dominance of grazing grasses (e.g., *Eragrostis tef and E. plana*) and abundance of AIPs, most likely the result of the historic and current land-use management practices.

The very high sensitivity for the Terrestrial Biodiversity Theme is only supported for the Freshwater Ecosystem Habitat, based on the representative nature of this habitat unit to the reference VU Soweto Highveld Grassland vegetation type. The specialist (SAS) classifies all freshwater ecosystems as very high sensitivity and the remainder of study and investigation areas as low sensitivity.

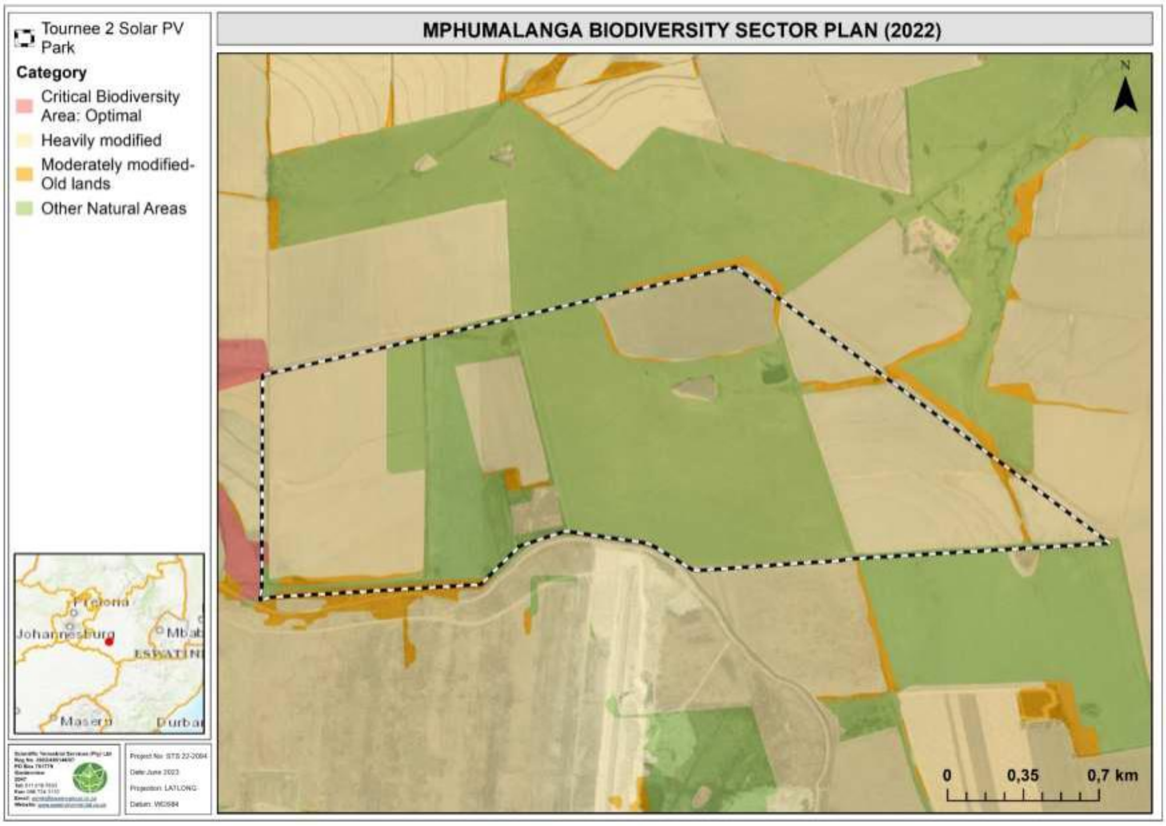


Figure 8-5 - The Tournée 2 Solar PV Facility in relation to the 2022 MBSP spatial dataset.

8.1.4 PLANT SPECIES

The DFFE Screening Tool indicates that the site has a medium sensitivity (**Figure 8-6**). The triggering species included Sensitive species 1252 (VU) and Sensitive Species 691 (VU)). The site visit was undertaking during the summer months which coincide with these species' flowering time, however, these species were not found during the site assessment and habitat for this species to occur is unlikely. The medium sensitivity for the Plant Species Theme is disputed by the specialist and the low sensitivity is confirmed.

Figure 8-6 - Map of Plant Species Sensitivity

Source: DFFE Screening Report

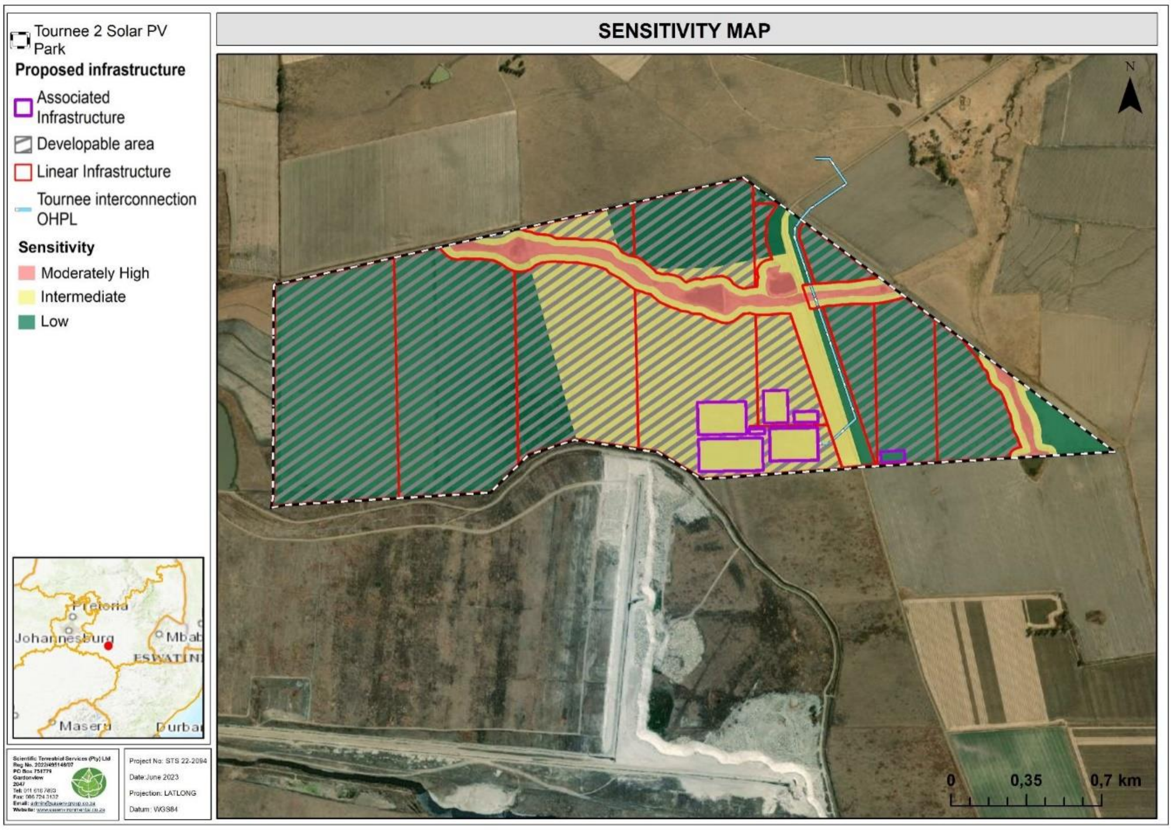


Figure 8-7 - Map of Plant Species Sensitivity

From a floral perspective, the data gathered during the site visit indicate that the Transformed Habitat is of low sensitivity, the Grassland Habitat is of intermediate sensitivity and the Freshwater Ecosystems are of moderately high sensitivity. These sensitivities consider various aspects, such as the presence or potential for floral species of conservation concern (SCC) (both threatened species as well as protected species), habitat integrity and levels of disturbance, threat status of the habitat type, the presence of unique landscapes and overall levels of diversity (compared to a reference type).

8.1.5 ANIMAL SPECIES

The DFFE Screening Tool indicates that the site has a medium sensitivity (**Figure 8-8**) due to potential suitable habitat for the following trigger species: *Aves: Tyto capensis* (African Grass Owl; VU) and *Eupodotis senegalensis* (White Bellied Korhaan; VU). *Insecta: Lepidochrysops procera* (Potchefstroom Blue; Rare) and Mammalia: *Crocidura maquassiensis* (Maquassie Musk Shrew; VU). The medium and low sensitivity for the Animal Species Theme for the Tournée 2 Solar PV Facility within the Grassland and Freshwater habitat is supported for Mammal, Herpetofauna and invertebrate.

Figure 8-8 - Map of Animal Species Sensitivity

Source: DFFE Screening Report

From a faunal ecological and resource management perspective, the Transformed Habitat Unit obtained a low sensitivity, the Grassland Habitat is of intermediate, and the Freshwater Ecosystems are of moderately high sensitivity. These sensitivities are based on historic and current anthropogenic activities that have altered the presence or the potential for faunal SCC, have degraded habitat integrity and increased levels of disturbance, and have diminished the presence of preferred habitat and overall faunal diversity within several sections of the site.

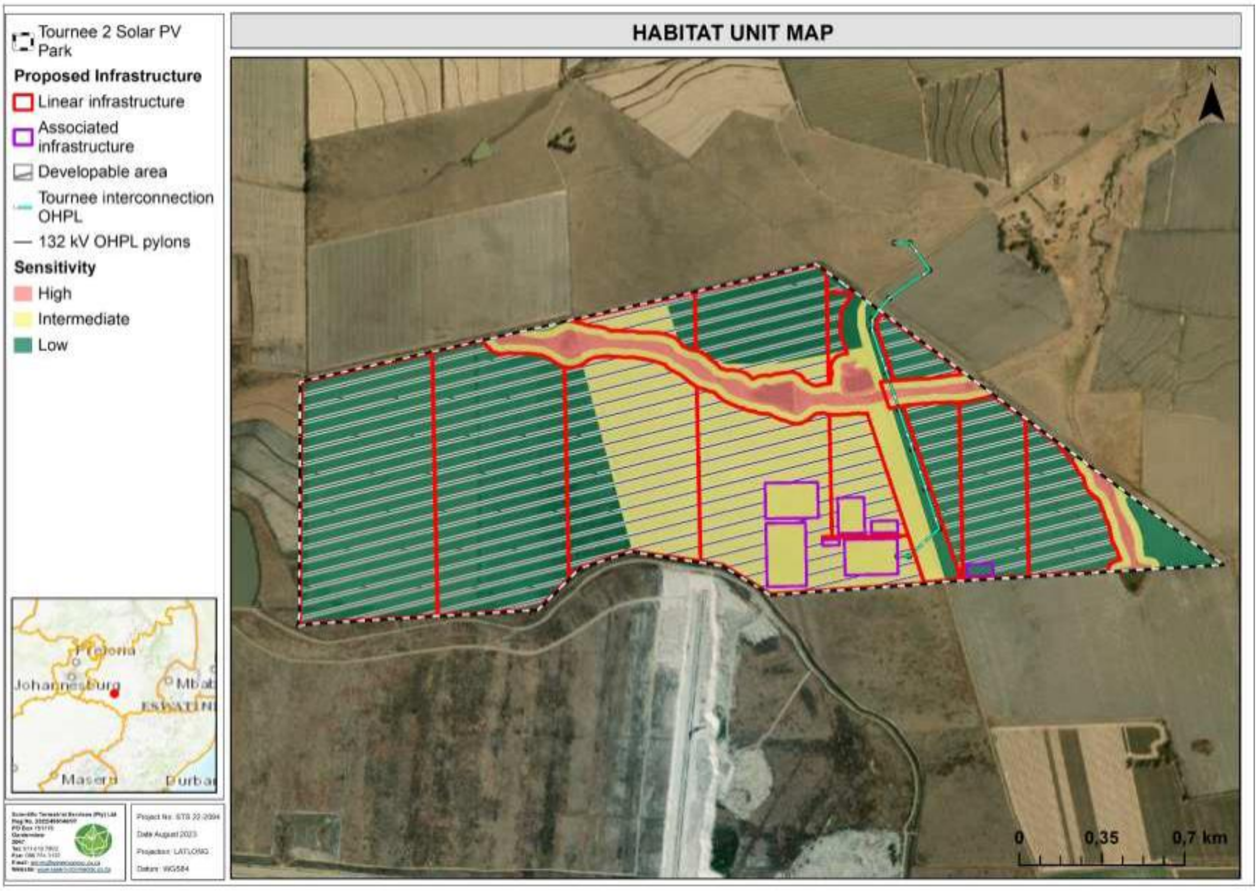


Figure 8-9 - Conceptual illustration of the habitat sensitivities associated with the proposed Tournée 2 Solar PV Facility layout.

8.1.6 AVIFAUNA

The output of the DFFE Screening Tool for the Avifauna Theme is illustrated in **Figure 8-10** and indicates that the site is classified as Low Sensitivity. Although a number of Priority Species were observed by Volant during the Scoping Survey, they all have a relatively low Priority Score. This in conjunction with the few sensitive areas that were found during the survey shows that Volant's findings align with the Sensitivity score given by the screening report and that the area is currently considered to be of Low Sensitivity to avifauna.

Figure 8-10 - Map of Avian Sensitivity

Source: DFFE Screening Report

8.1.7 ARCHAEOLOGICAL AND CULTURAL HERITAGE

The output of the DFFE Screening Tool for Archaeological and Cultural Heritage Theme is illustrated in **Figure 8-11** and indicates that the site is classified as Low Sensitivity.

The results of the site sensitivity are summarised below:

- The cultural value of the broader area has some significance in terms of its mining and agricultural history: Moderate
- Some significant archaeological resources were identified within the broader area: Moderate

Both WP 002 and WP 003 fall within the areas proposed for the Tournée 1 PV Facility. All the graves are highly significant, and a 50m buffer zone with a fence is recommended to ensure their conservation. The 50m buffer zone falls within the Tournée 2 PV Facility (**Figure 8-12**). The site is therefore considered as having a medium sensitivity.

Figure 8-11 - Map of Archaeological and Heritage Sensitivity

Source: DFFE Screening Report

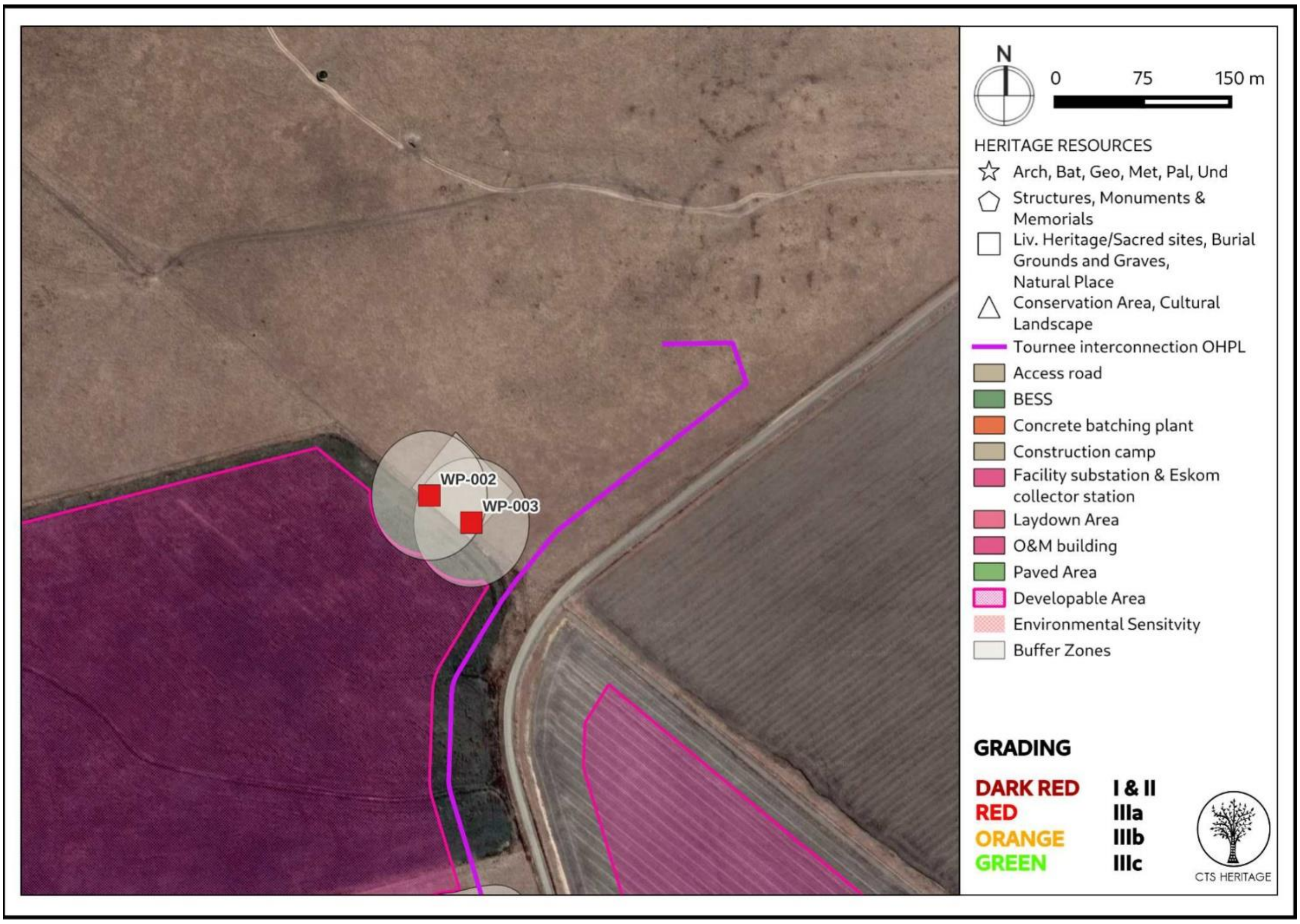


Figure 8-12 – Heritage resources and buffer identified in close proximity to the Tournée 2 Solar PV Facility

Source: CTS Heritage, 2023

8.1.8 PALAEONTOLOGY

According to the DFFE Screening Tool analysis, the development area has Very High levels of sensitivity for impacts to palaeontological heritage and Low levels of sensitivity for impacts to archaeological and cultural heritage resources. The results of this assessment in terms of site sensitivity are summarised below:

The cultural value of the broader area has some significance in terms of its mining and agricultural history (Moderate)

Some significant archaeological resources were identified within the broader area (Moderate)No highly significant palaeontological resources were identified within the development area, however the geology underlying the development area is very sensitive for impacts to significant fossils (Moderate)

As per the findings of Palaeontology assessment, and its supporting documentation, the outcome of the sensitivity verification disputes the results of the DFFE Screening Tool for Palaeontology - this should be considered to be Moderate - and disputes the results of the screening tool for archaeology and cultural heritage - this should be considered to be Moderate. This evidence is provided in the body of the report and in the appendices (Appendix 1 and 2**) (Appendix H.8)**

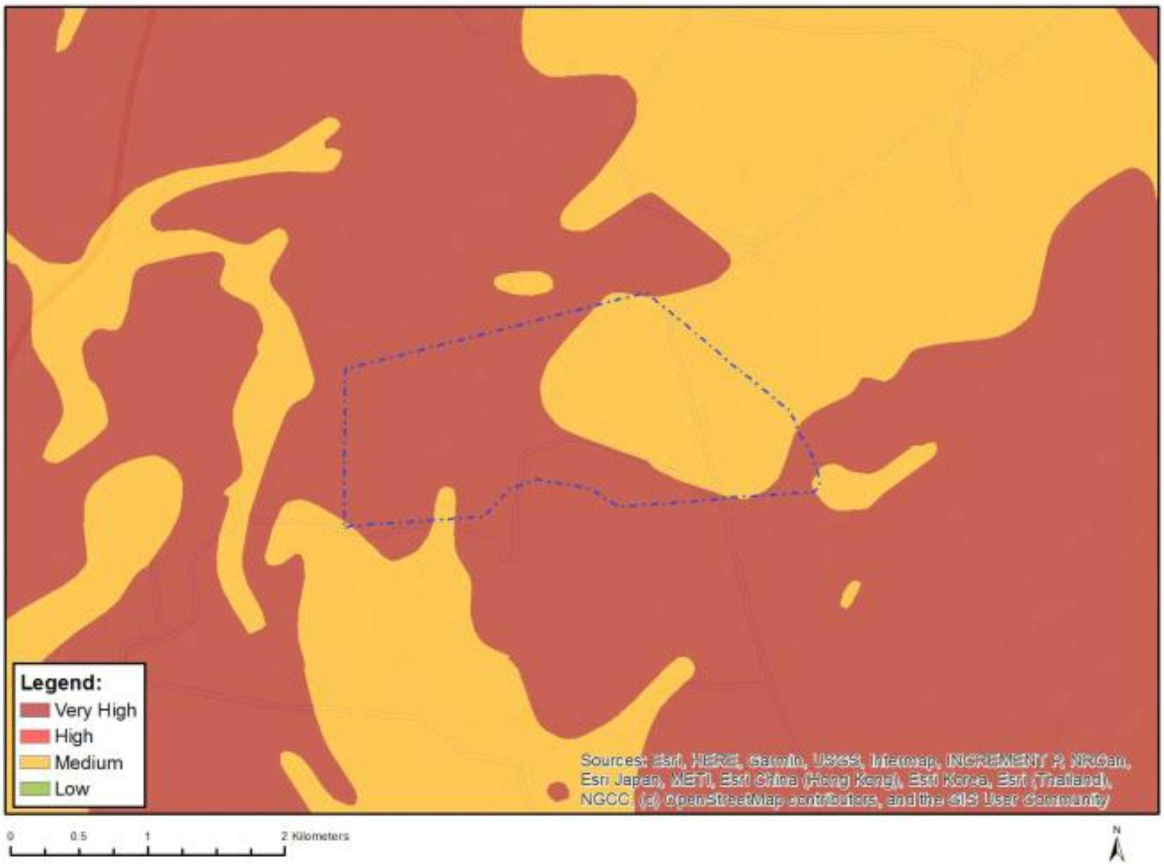


Figure 8-13 - Map of Palaeontology Sensitivity

Source: DFFE Screening Report

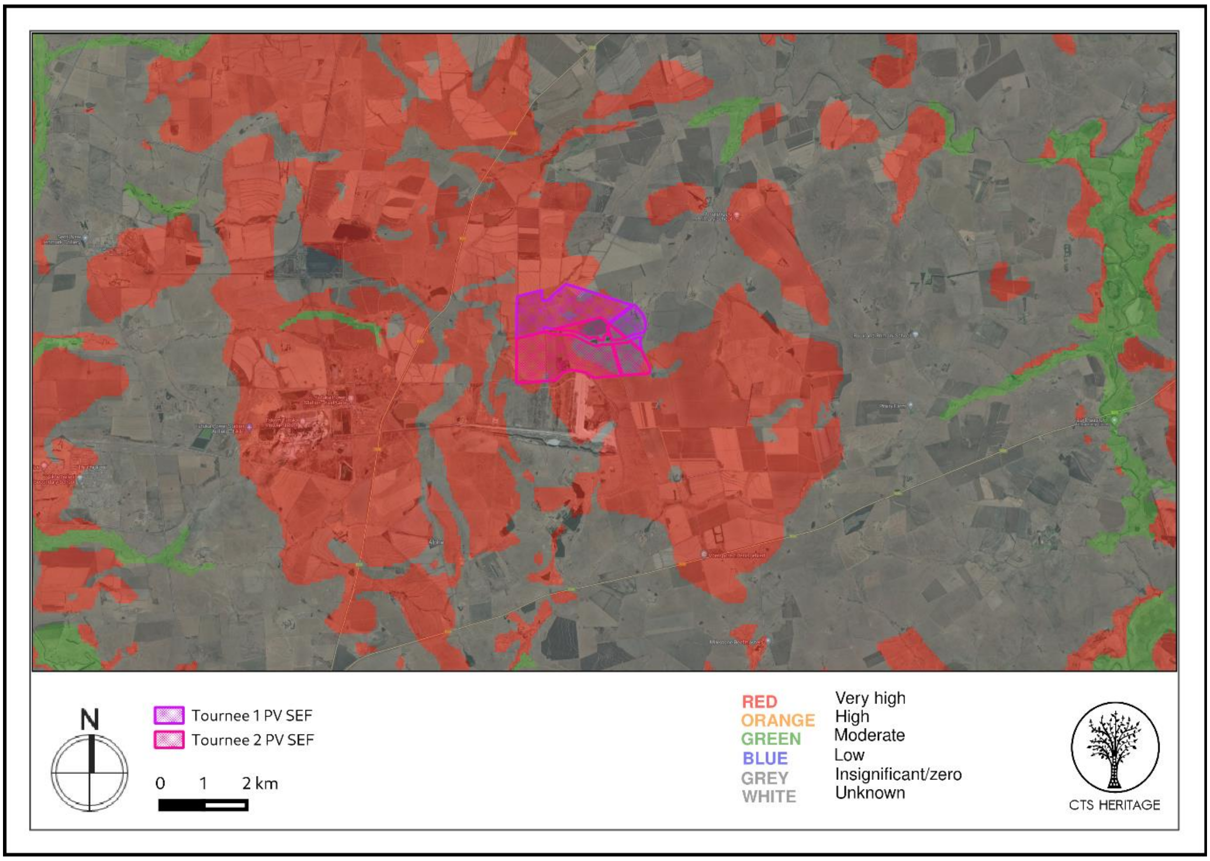


Figure 8-14 - SAHRIS palaeosensitivity map for the site for the proposed Tournée PVs

Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero

Source: Bamford, 2023

According to the PIA completed for the project, based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct age and type to preserve fossils. The site visit and walk through confirmed that there were NO FOSSILS of any significance in the project footprint. Furthermore, the surface material to be excavated is soil and this does not preserve fossils. Since there is a small chance that fossils from the Vryheid Formation might occur below ground and might be disturbed when excavations commence for foundations and infrastructure, a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact to fossil heritage resources is low to moderate.

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and only some do contain fossil plant, insect, invertebrate and vertebrate material. The site visit and walk through on 06 February 2023 (summer) by palaeontologists confirmed that there are no fossils on the surface. There were no outcrops of shales that could potentially preserve fossils. There were no fossils on the surface. It is not known what lies below the surface but the soils appear to be a metre or more deep. The overlying soils and sands of the Quaternary period would not preserve fossils.

Based on the fossil record but confirmed by the site visit and walk through there are NO FOSSILS of any significance such as those of recognisable Glossopteris floral elements, even though fossils have been recorded from rocks of a similar age and type in South Africa. It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur below the ground surface in the shales of the Vryheid Formation so a Fossil Chance Find Protocol must be implemented for the duration of excavation activities.

8.1.9 LANDSCAPE (VISUAL)

The output of the DFFE Screening Tool for the Landscape Theme is illustrated in **Figure 8-15** and indicates that the western and eastern portions of the site is classified as Very High Sensitivity as the area is believed to have mountain tops and high ridges. The remaining portions of the Tournée 2 Solar PV Facility is considered to have no sensitivity.

Based on the field assessment it is evident that there are no high ridges or mountain tops within the Tournée 2 Solar PV Facility as the terrain within the Tournée 2 Solar PV Facility is gently sloping, with the surrounding landscape displaying undulating terrain, with no prominent outcrops or ridges in this specific area. In terms of the above-mentioned, the very high sensitivity as per the screening tool outcome is thus not supported and classification as a low sensitivity site is considered more appropriate.

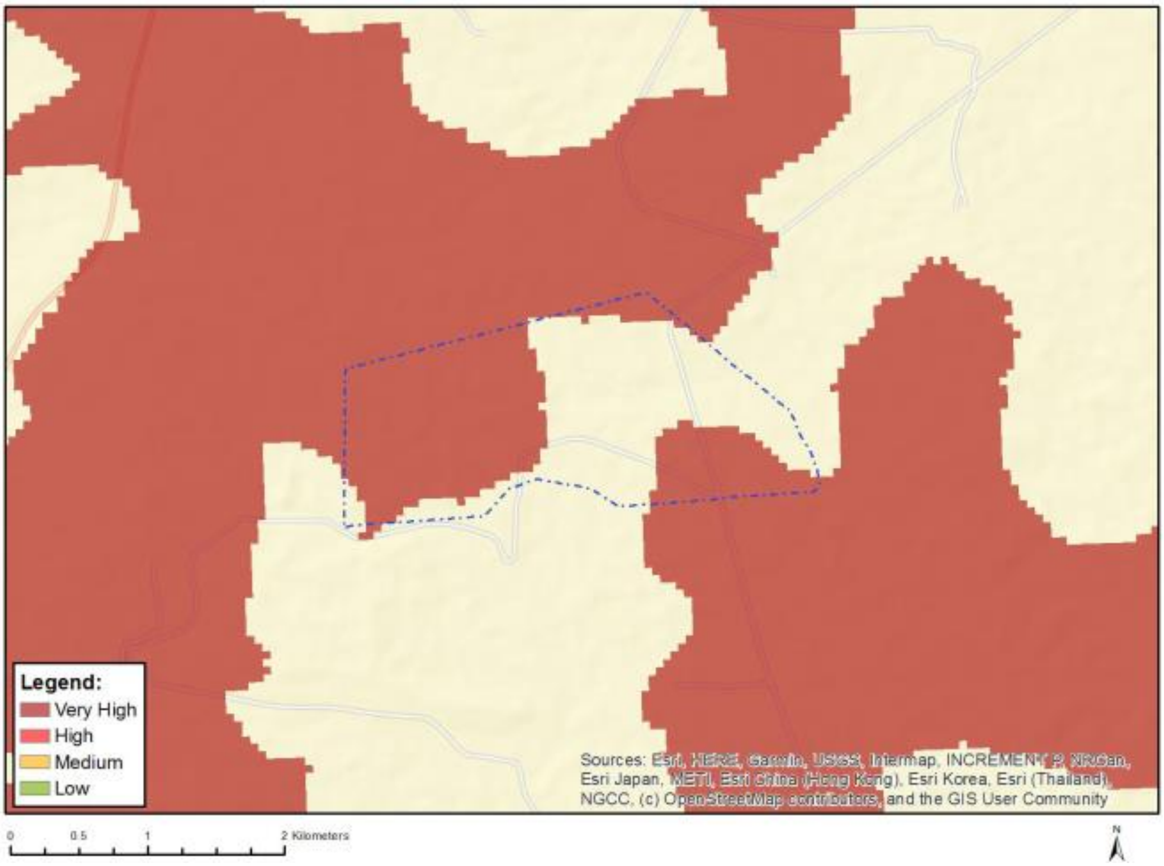


Figure 8-15 - Map of Landscape Sensitivity

Source: DFFE Screening Report

Based on the outcome of the desktop and field assessments, it is evident that the number of potential sensitive receptors situated within the visual assessment zone is not more than 20, comprising of farmsteads and gravel roads. Since the Tournée 2 Solar PV Facility is located adjacent to the ash dump of the Tutuka Power Station, and within 5 km of the Tutuka Power Station, the proposed solar facility is located in an area where anthropogenic structures, and particularly those related to energy generation, form part of the skyline, and due to the relatively low height of the proposed infrastructure it will not be significantly visually intrusive on the receiving environment. Furthermore, with the colour palette of the Tournée 2 Solar PV Facility it is likely to blend in with the silhouette of the ash dump especially to sensitive receptors located to the north, and the ash dump will completely screen view from sensitive receptors located south.

During the field assessment if was further evident that the undulating topography and cultivated fields in the surrounding area, either partially or completely obscures the view towards the Tournée 2 Solar PV Facility, therefore the visual impact for the Tournée 2 Solar PV Facility is considered moderate as the visual intrusion on the receiving environment will be limited.

Based on the desktop and field assessments the Scenic Quality of the Tournée 2 Solar PV Facility falls within Class C, which is a landscape that have features that are common to the region, i.e. the cultivated fields interspersed by the grasslands and freshwater ecosystems.

With the Tournée 2 Solar PV Facility located in a rural area where no farmsteads are present within a 1 km radius, the visual inventory classes is not applicable.

A 30m no development buffer is recommended for the gravel road traversing the Tournée 2 Solar PV Facility, to reduce the quantum of risk of glint and glare on farmers utilising the road. The figure below illustrates the visual opportunities and constraints for the Tournée 2 Solar PV Facility (**Figure 8-16**). This opportunities and constraints map provides adequate information for informed decision making to take place and to assist in the definition of the preliminary layout for the Tournée 2 Solar PV Facility for the EA process.

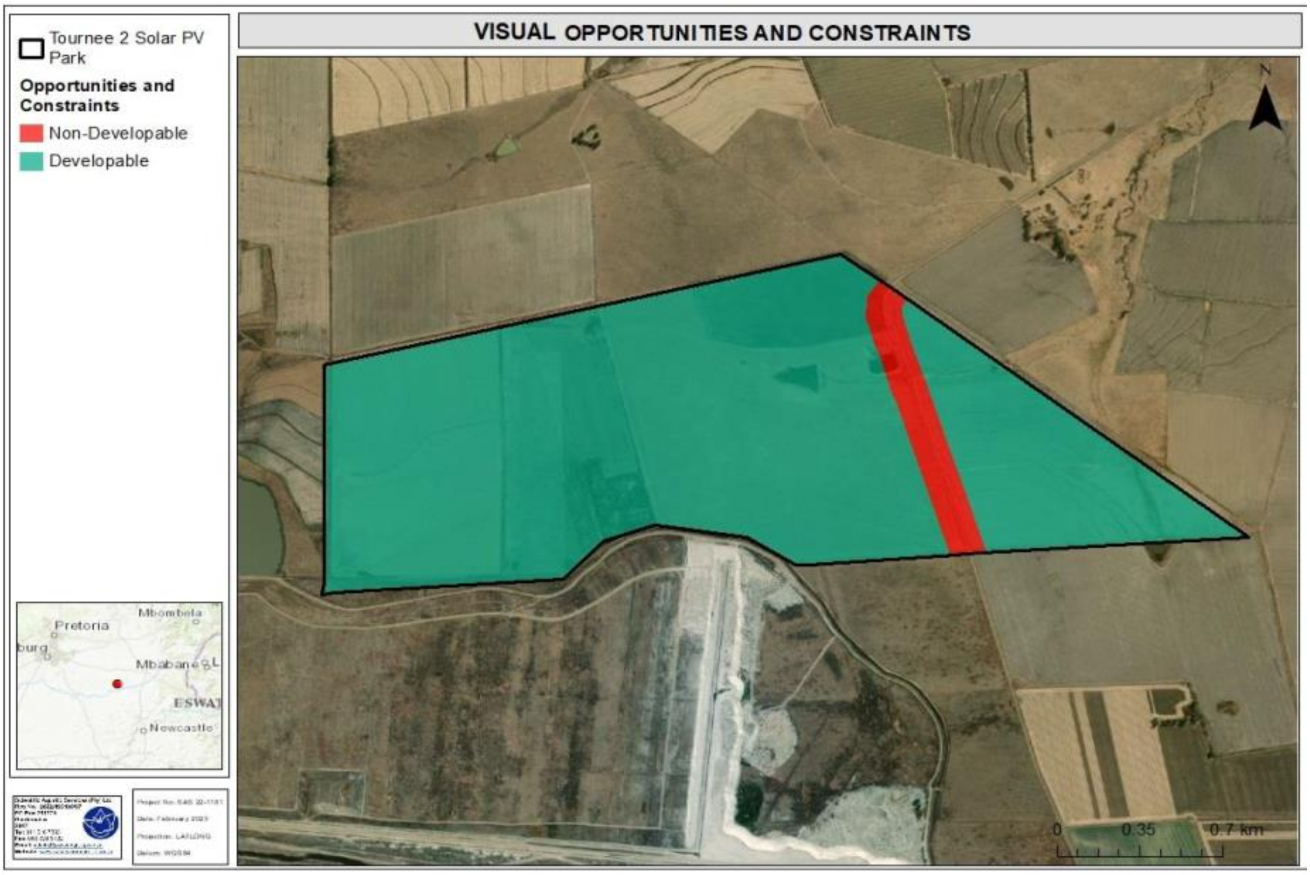


Figure 8-16 - Visual opportunities and constraints map the Tournée 2 Solar PV Park.

Source: SAS, 2023

8.1.10 CIVIL AVIATION

The output of the DFFE Screening Tool for the Civil Aviation Theme is illustrated in **Figure 8-17** and indicates that the site is classified as Medium Sensitivity. The medium sensitivity is due to the presence of a civil aviation aerodrome within 8km of the investigation area.

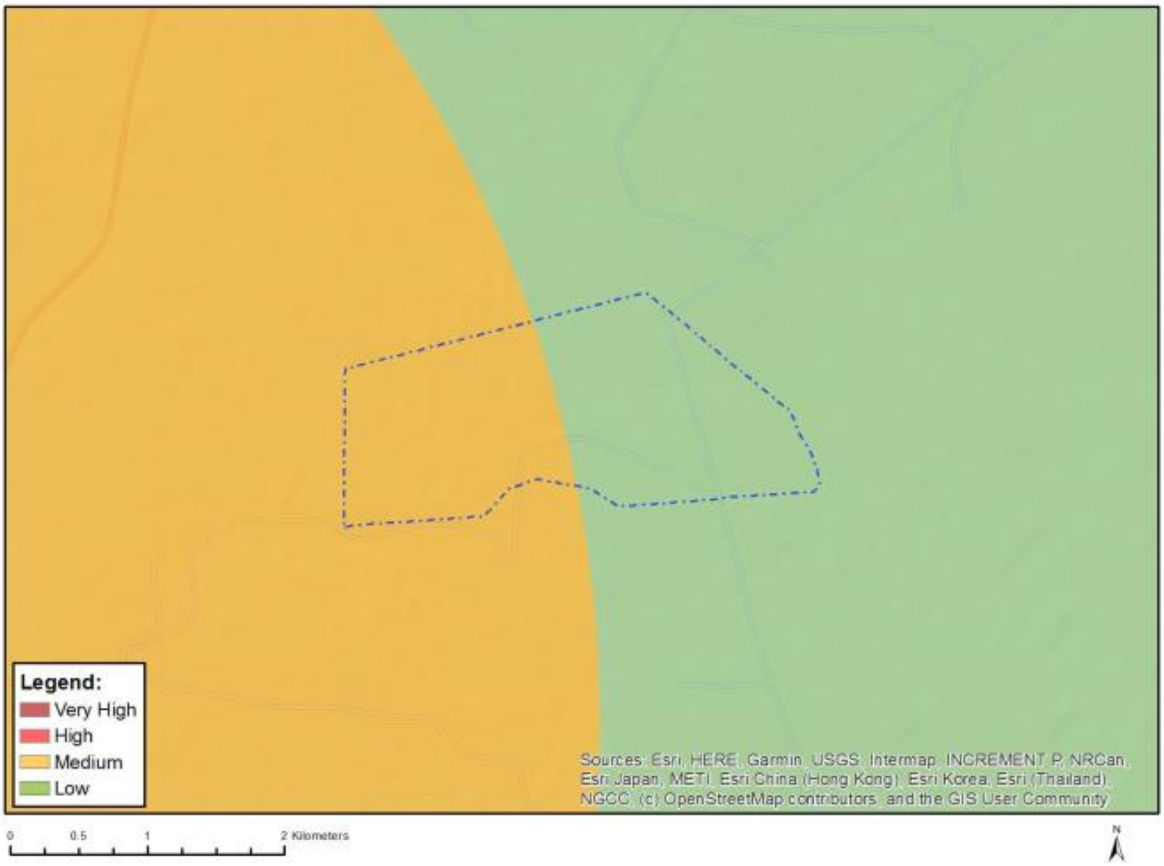


Figure 8-17 - Map of Civil Aviation Sensitivity

Source: DFFE Screening Report

According to the DWS Screening Tool's Civil Aviation Theme, the western portion of Tournée 2 Solar PV Facility is situated within 8 km of a civil aviation aerodrome and the remainder of the site is located between 8 and 15 km of another civil aviation aerodrome. The airstrip of the Tutuka Power Station Airfield – FATT is located approximately 6,3 km west of the Tournée 2 Solar PV Facility. Airstrips with the runway situated on an east to west axis and located at an angle of less than 30 degrees to the north and 20 degrees to the south in the southern hemisphere from a proposed PVSEF are invariably at a higher risk of experiencing glint and glare, due to the airstrip being orientated at an angle that would lead to reflection toward the runway. The abovementioned airstrip axis is orientated at a north north-east to south south-west direction, which puts the airstrip at a significantly lower risk to glint and glare impacts when landing and on take-off from features in the landscape.

The Tournée 2 Solar PV Facility is located at an angle between 60˚ and 65˚ to the runway axis, depending on the position within the Tournée 2 Solar PV Facility. Figure 12 below provides an illustration of the bearings from the airstrip to the Tournée 2 Solar PV Facility. Line 1 is the direction of the airstrip which is at a bearing of 18.28˚, the angle of incidence of line 2 is at a bearing of 81.08˚, indicating that the airstrip is at a 62.8˚ from the Tournée 2 Solar PV Facility. Line 3 is at bearing of 80.02˚, indicating that the airstrip is at an angle of 61.74˚ from the Tournée 2 Solar PV Facility. From the above, the risk of glint and glare on the Tutuka Power Station Airfield – FATT is reduced considerably. Should there be risk of glint and glare, it will be most significant in the mornings and in winter months when the sun rises further to the north. Should glint and glare be experienced, this could be mitigated with a simple go-around of the aircraft and landing in the opposite direction which should be possible in the early morning when winds are generally at a lower speed and direction of landing is not a significant factor. Solar PV systems can safely coexist in area where aerodromes are located, provided that mitigation measures are undertaken.

This theme has been identified as a medium sensitivity; however, a sensitivity verification has been undertaken by the EAP and the theme has been verified to be low. Furthermore, the SACAA has been included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought.

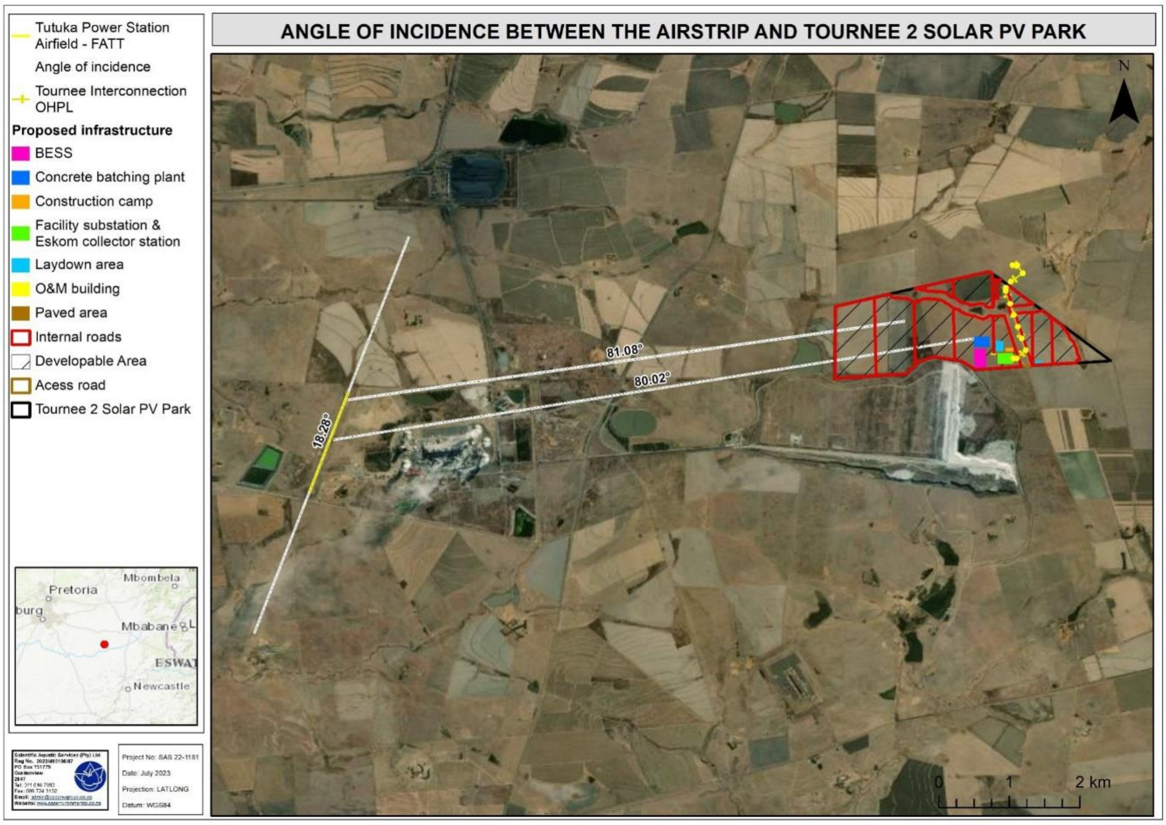


Figure 8-18 - Map illustrating the angle of incidence between the Tutuka Power Station Airfield – FATT and Tournée 2 Solar PV Park, for illustrative purposes.

8.1.11 DEFENCE

The output of the DFFE Screening Tool for the Defence Theme is illustrated in **Figure 8-19** and indicates that the site is classified as Low Sensitivity. A compliance statement is therefore not required.

Figure 8-19 - Map of Defence Sensitivity

Source: DFFE Screening Report

8.1.12 RADIO FREQUENCY INTERFERENCE

The output of the DFFE Screening Tool for the RFI Theme is illustrated in **Figure 8-20** and indicates that the site is classified as Medium Sensitivity. The medium sensitivity is due to the presence of a telecommunication facility within 1km of the south-eastern point of the Tournée 2 Solar PV Facility. The sensitivity is not supported as less than 1% of the site’s footprint falls within the medium sensitivity area. The EAP classifies the investigation area as low sensitivity.

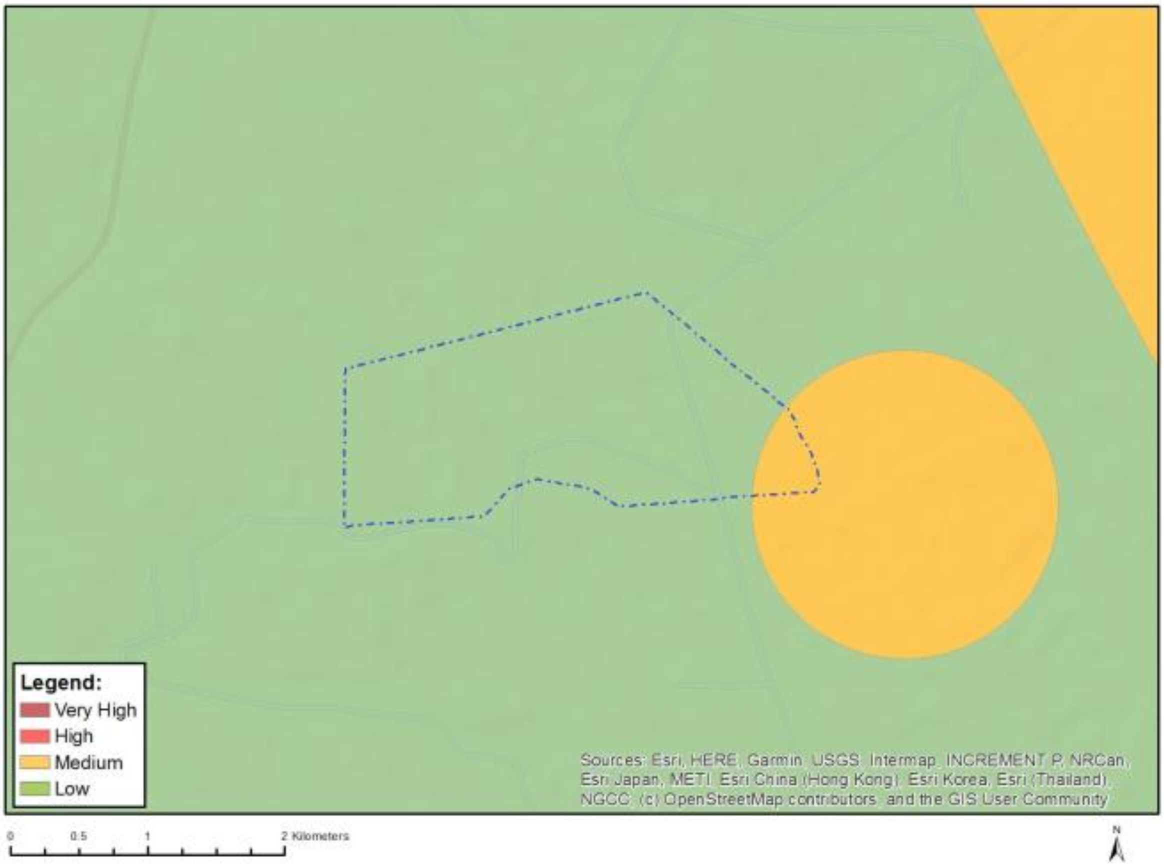


Figure 8-20 - Map of RFI Sensitivity

Source: DFFE Screening Report

8.1.13 BESS

There are a few isolated farmhouse complexes and the Tutuka related activities. None of the dwellings/activities in the area is within 500m of the proposed BESS location. **Figure 8-21** shows 500m circles around the proposed PV2 BESS Facilities (Blue) as well as local farmsteads with (red 500m circles) and near-by water courses/bodies (red/purple areas).

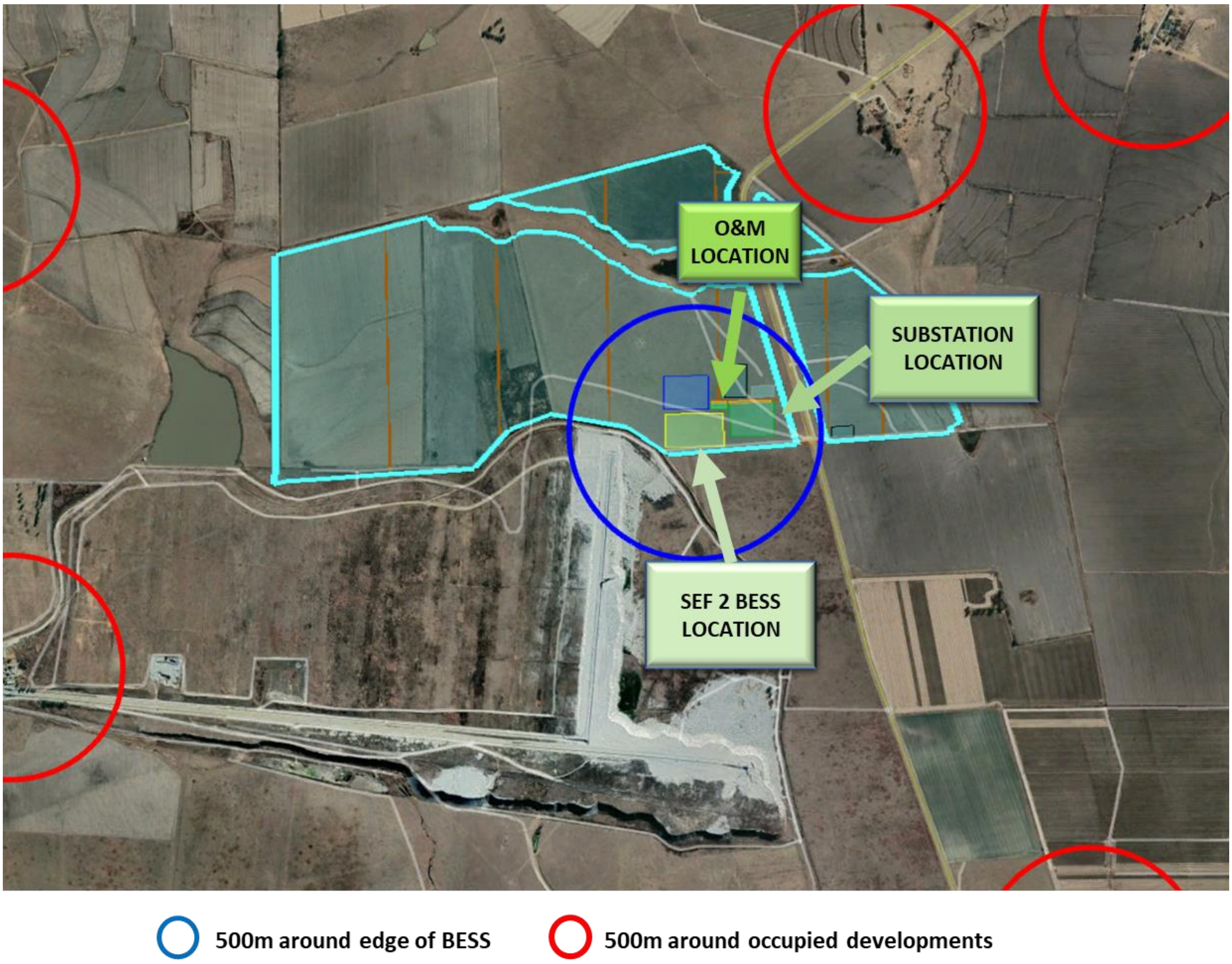


Figure 8-21 - 500m circles around the PV 1 BESS Facilities (Blue) and Location of Farmhouses (Red) in the immediate vicinity of the BESS

Source: iSHEcon, 2023

8.2 SENSITIVITY MAPPING

A consolidated environmental sensitivity map has been compiled based on the sensitivities and buffers outlined in the following specialist studies:

- Aquatic Biodiversity;
- Terrestrial Biodiversity;
- Heritage; and
- Visual.

The location of the project infrastructure (i.e., layout) was determined based on initial environmental and technical screening which considered the infrastructure locations feasible from a constructability perspective. This included several key aspects including environmental constraints and opportunities, distance to grid connection, topography, site accessibility.

The conceptual layout was taken forward for assessment by the various Specialists during this EIA Phase. **Figure 8-22** shows the environmental sensitivity features overlain with the conceptual layout.

Based on sensitivities identified by specialist, the project layout has been optimised. The conceptual layout was optimised based on the following:

- Repositioning of the internal road crossing to avoid bisecting the CVB wetland;
- Repositioning of the powerline to ensure that the pylons will be located outside of the wetlands; and
- Repositioning of the BESS so it is further away from the office/workshop area.

Figure 8-23 shows the environmental sensitivity features overlain with the conceptual layout.

NO-GO AREA

Legislated "no go" areas or setbacks are areas or features that are considered of such significance that impacting them may be regarded as fatal flaw or strongly influence the project impact significance profile. Therefore areas or features that are considered to have a high sensitivity or where project infrastructure would be highly constrained and should be avoided as far as possible are referred to as "no-go" areas. Infrastructure located in these areas are likely to drive up impact significance ratings and mitigations. The assumption is that the overhead lines could span these areas, but the towers/pylons should adhere to the buffer distances as indicated as far as possible where areas are too large to span (buffers) then these tower positions must be evaluated on a case by case basis prior to construction. A "no-go" map has been included in **Figure 8-24**.

This map includes a 30 m visual buffer specifically for solar panels to mitigate the glint and glare impact to road users. The solar panels are to be constructed outside of the visual buffer. All other ancillary infrastructure including roads, overhead powerlines and cabling will be allowed in this area.

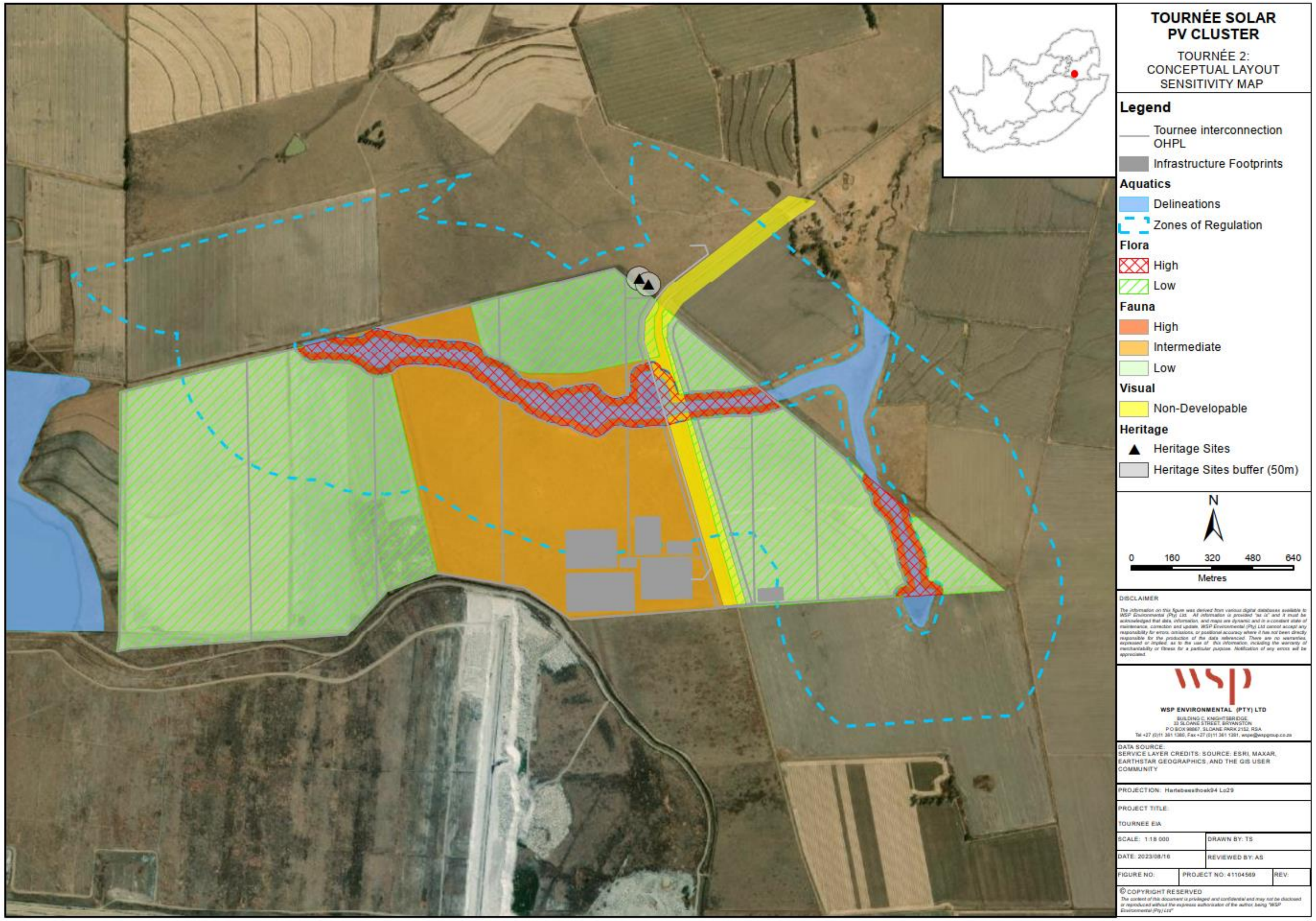


Figure 8-22 - Conceptual Layout Sensitivity Map for Tournée 2 Solar PV Facility

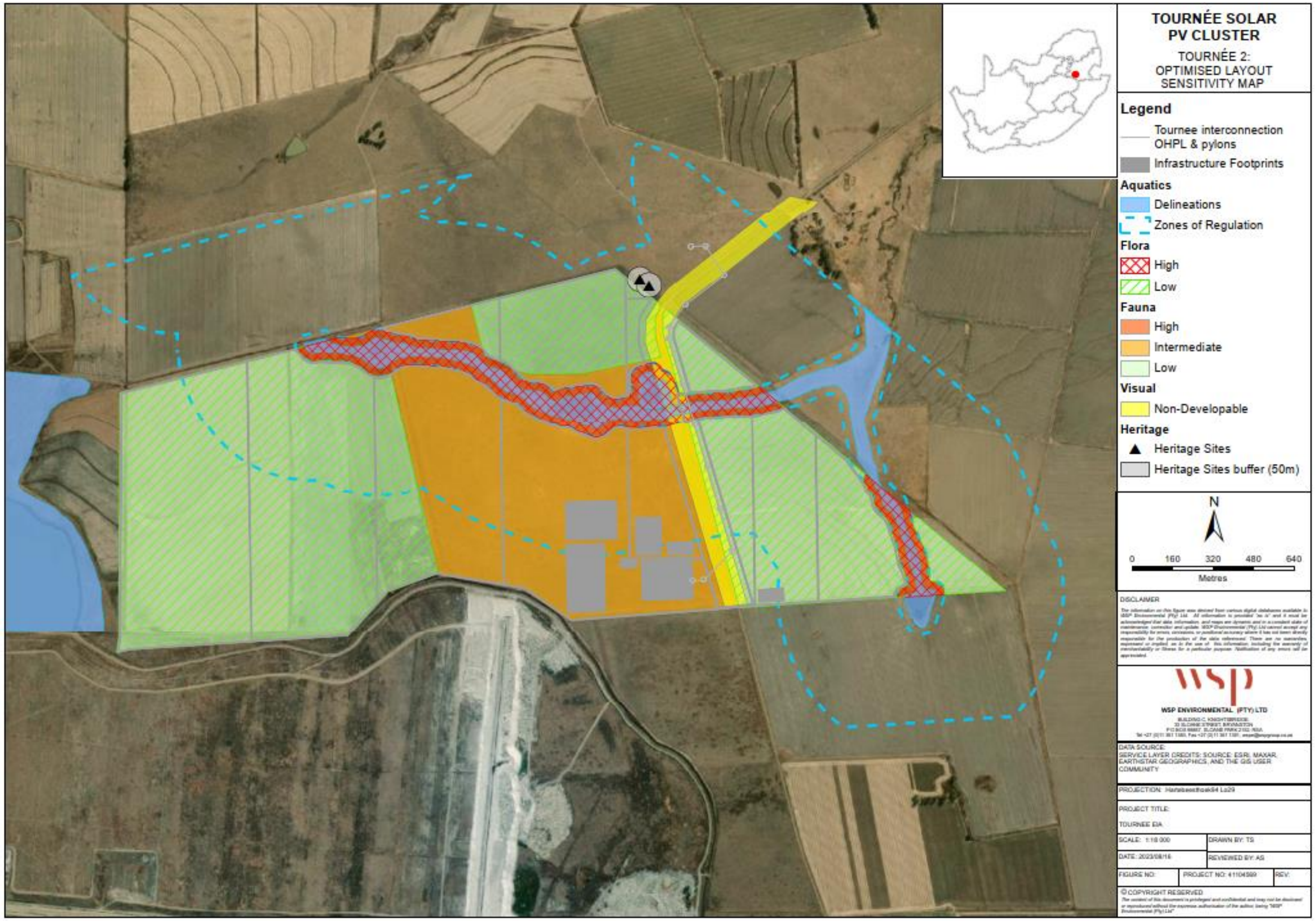


Figure 8-23 - Optimised Layout Sensitivity Map for Tournée 2 Solar PV Facility

Figure 8-24 - No-Go Map for Tournée 2 Solar PV Facility

9 ENVIRONMENTAL IMPACT ASSESSMENT

This Chapter identifies the perceived environmental and social effects associated with the proposed Project. The assessment methodology is outlined in **Section 3.4**. The issues identified stem from those aspects presented in **Section 7** of this document as well as the Project description provided in **Section 4**.

Furthermore, a decommissioning assessment will be considered as part of the decommissioning process that will be subject to a separate authorisation and impact assessment process. Any decommissioning impacts will be assessed at this stage. The impact assessment in this section encompasses the geographical, physical, biological, social, economic, heritage and cultural aspects in accordance with Appendix 1 of GNR 326.

9.1 AGRICULTURAL POTENTIAL ASSESSMENT

9.1.1 PRE-CONSTRUCTION

Table 9-1 – Impact from Loss of Land Capability

Potential Impact: Potential poor planning leading to placement of stripped and stockpiled soils outside the demarcated areas.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	3	3	4	5	**70**	**High**	(-)
With Mitigation	1	1	3	3	3	**24**	**Low**	(-)
Mitigation and Management Measures	▪ Infrastructure footprint area should be clearly demarcated to avoid unnecessary disturbance of adjacent soils. ▪ Access road should be aligned to the existing road as far as practically possible to avoid further agricultural impact and unnecessary soil disturbance. ▪ Always strip a suitable time before the placement or construction of the solar PV facilities, to avoid soil loss and contamination.							

Table 9-2 – Impact on Soil Erosion

Potential Impact: Potential poor planning leading to placement of the solar PV and associated infrastructure on moderate potential agricultural soils utilised for grazing.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	3	27	Low	(-)
With Mitigation	2	1	3	2	2	16	Low	(-)
Mitigation and Management Measures	▪ Revegetate adjacent areas with an indigenous grass mix, to re-establish a protective cover, in order to minimise soil erosion and dust emissions.							

Table 9-3 – Impact on Soil Contamination

Potential Impact: Potential poor planning leading to spillage of petroleum hydrocarbons on moderate potential agricultural soils utilised for grazing.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	4	4	48	Moderate	(-)
With Mitigation	2	2	3	4	2	22	Low	(-)
Mitigation and Management Measures	▪ Always strip a suitable time before the placement or construction of the solar PV facilities, to avoid soil loss and contamination.							

Table 9-4 – Impact on Soil Compaction

Potential Impact: Potential poor planning leading to placement of the solar PV and associated infrastructure on soils susceptible to compaction.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	5	55	Moderate	(-)
With Mitigation	2	1	3	4	3	30	Low	(-)
Mitigation and Management Measures	▪ Construction vehicle movement should be limited to within the project perimeter fence to avoid unnecessary							

	compaction of adjacent soils.

9.1.2 CONSTRUCTION PHASE

Table 9-5 – Impact on Loss of Land Capability

Potential Impact: Soil stripping/excavation and removal of soil as a growth medium and loss of grazing land.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	5	3	3	5	5	80	High	(-)
With Mitigation	1	1	3	3	3	24	Low	(-)
Mitigation and Management Measures	▪ The proposed Solar Photovoltaic (PV) Facilities development within the study area should aim to minimise the impact on soils with used for grazing activities; ▪ Although the soils have a high clay content, temporary erosion control measures in sloping areas should be used to protect the disturbed soils during the construction phase until adequate vegetation has established;							

Table 9-6 – Impact on Soil Erosion

Potential Impact: Site clearing, removal of vegetation, and associated disturbances to soils, leading to increased runoff, erosion, and consequent loss of land capability in cleared areas and subsequent loss of soils utilised for grazing. Potential frequent movement of earth moving machinery within lose and exposed soils, leading to excessive erosion.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	3	33	Moderate	(-)
With Mitigation	2	2	3	4	2	22	Low	(-)
Mitigation and Management Measures	▪ Bare soils within the access roads can be regularly dampened with water to suppress dust during the construction phase, especially when strong wind conditions are predicted according to the local weather forecast; ▪ All disturbed areas adjacent to the proposed development areas should be re-vegetated with an indigenous grass mix, if necessary, to re-establish a protective cover, to minimise soil erosion and dust emission; ▪ Revegetate the disturbed soils with an indigenous grass mix, to re-establish a protective cover, in order to minimise soil erosion and dust emissions;							

Table 9-7 – Impact on Soil Contamination

Potential Impact: Spillage of petroleum hydrocarbons during construction of the proposed solar facilities and the associated access road. Potential disposal of hazardous and non-hazardous waste, including waste material spills and refuse deposits into the soil.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	5	55	Moderate	(-)
With Mitigation	2	1	3	4	3	30	Low	(-)
Mitigation and Management Measures	▪ Contamination prevention measures should be addressed in the Environmental Management Programme (EMP) for the proposed development, and this should be implemented, always made available and accessible to the contractors and construction crew conducting the works on site for reference; ▪ A spill prevention and emergency spill response plan, as							

	well as dust suppression, and fire prevention plans should also be compiled to guide the construction works; ▪ An emergency response contingency plan should be put in place to address clean-up measures should a spill and/or a leak occur, as well as preventative measures to prevent contamination; ▪ Burying of any waste including domestic waste, empty containers on the site should be strictly prohibited and all construction rubble waste must be removed to an approved disposal site.

Table 9-8 – Impact on Soil Compaction

Potential Impact: Frequent disturbances of soils during the maintenance of the solar PV, resulting in risk of compaction.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	3	4	3	39	Moderate	(-)
With Mitigation	2	1	3	2	2	16	Low	(-)
Mitigation and Management Measures	▪ Although the soils have a high clay content, temporary erosion control measures in sloping areas should be used to protect the disturbed soils during the construction phase until adequate vegetation has established; ▪ The footprint areas should be lightly ripped to alleviate compaction.							

9.1.3 OPERATIONAL PHASE

Table 9-9 – Impact on Loss of Land Capability

Potential Impact: Frequent disturbances of soils, resulting in risk of reduced soil quality.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	4	4	48	Moderate	(-)
With Mitigation	2	1	3	2	2	16	Low	(-)
Mitigation and Management Measures	▪ Maintenance vehicles should be checked for leakages of hydrocarbons prior to commencement of maintenance activities; ▪ Maintenance vehicles should stick to demarcated road as							

	far as practically possible to minimise soil compaction on adjacent soils; ▪ The solar panels should be cleaned with clean water and use of chemicals should be avoided to minimise the likelihood of potential soil contamination; ▪ Disturbed areas adjacent to the footprint area should be revegetated with indigenous grass mix to limit potential soil erosion.

Table 9-10 – Impact on Soil Erosion

Potential Impact: Frequent disturbances of soils during the maintenance of the solar PV, resulting in risk of erosion.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	3	4	3	30	Low	(-)
With Mitigation	1	1	3	2	2	14	Low	(-)
Mitigation and Management Measures	▪ Disturbed areas adjacent to the footprint area should be revegetated with indigenous grass mix to limit potential soil erosion.							

Table 9-11 – Impact on Soil Contamination

Potential Impact: Leaching of hydrocarbons chemicals into the soils from maintenance equipment, leading to alteration of the soil chemical status as well as contamination of ground water.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	3	4	3	30	Low	(-)
With Mitigation	1	1	3	2	2	14	Low	(-)
Mitigation and Management Measures	▪ Maintenance vehicles should be checked for leakages of hydrocarbons prior to commencement of maintenance activities; ▪ The solar panels should be cleaned with clean water and use of chemicals should be avoided to minimise the likelihood of potential soil contamination;							

Table 9-12 – Impact on Soil Compaction

Potential Impact: Frequent disturbances of soils during the maintenance of the solar PV, resulting in risk of compaction.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	3	4	3	30	Low	(-)
With Mitigation	1	1	3	2	2	14	Low	(-)
Mitigation and Management Measures	▪ Maintenance vehicles should stick to demarcated road as far as practically possible to minimise soil compaction on adjacent soils;							

9.2 AQUATIC BIODIVERSITY IMPACT ASSESSMENT

9.2.1 CONSTRUCTION PHASE

The impact on the freshwater ecosystem habitat during the construction phase is indicated in **Table 9-13** and **Table 9-14**.

The proposed Tournée 2 Solar PV Facility and associated infrastructure has been acceptably designed to optimally avoid the CVB wetlands and the associated NEMA 32m ZoR, which is deemed the minimum mitigation measure to minimise potential impacts on the freshwater ecosystems. This will optimally ensure increased protection from the risk of the potential increase in sedimentation and erosion from the removal and clearing of natural terrestrial vegetation in close proximity (less than 40m) to the CVB wetland.

Table 9-13 – Impact on ecosystem habitat during the construction phase

Potential Impact: Vegetation clearing	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	3	2	4	36	Moderate	(-)
With Mitigation	2	1	1	1	2	10	Very Low	(-)
Mitigation and Management Measures	▪ The entire construction area (development site) must be fenced prior to the commencement of construction and vegetation clearing to ensure that no vehicle or other construction personnel access occurs off the site and within the 32m ZoR of the or into the freshwater ecosystems themselves. ▪ Vegetation clearing must be restricted to the approved development footprint, done in a phased manner as the							

	development of the proposed Tournée 2 Solar PV Park progresses and, as much indigenous vegetation as possible is to be retained. ▪ Drifts fences/silt curtains (as part of construction-phase stormwater control system) must be placed along the NEMA 32m ZoR to mitigate against potential sediment deposition and erosion control. ▪ Dust suppression techniques must be implemented to prevent smothering of freshwater vegetation. ▪ Protect exposed soil/ soil stockpiles by means of a geotextile fabric such as hessian sheeting. ▪ Contractor laydown areas, vehicle re-fuelling areas and material storage facilities to remain outside of the delineated freshwater ecosystems and the associated NEMA 32m ZoR. ▪ The CVB wetland and associated NEMA 32m ZoR must be clearly demarcated by an Environmental Control Officer (ECO) and marked as a no-go area. ▪ Construction footprint areas to remain within the authorised footprint and vegetation clearing to be limited to the development footprint area.

Table 9-14 – Impact on ecosystem habitat during the construction phase

Potential Impact: Construction of infrastructure	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	1	3	2	4	**36**	**Moderate**	(-)
With Mitigation	2	1	1	1	2	**10**	**Very Low**	(-)
Mitigation and Management Measures	▪ During excavation activities, it must be ensured that stockpiles are not higher than 2 m in height and all exposed soil must be protected for the duration of the construction phase with a suitable geotextile (e.g. Geojute or hessian sheeting) to prevent erosion and sedimentation of the receiving freshwater environment. Furthermore, measures must be undertaken to limit the time in which soil is expose. ▪ Dust suppression measures must be implemented (such as spray watering on gravel access roads) throughout the proposed development activities to prevent excessive dust and suppress the potential for runoff of sediment which may smother vegetation. ▪ Construction vehicles not in use and fuel storage facilities must be underlain by batter boards to prevent spills from contaminating groundwater. ▪ Proper handling and disposal of concrete and cement-related mortars is considered imperative to minimize or eliminate discharge into the drainage lines. ▪ Fresh concrete and cement mortar must be mixed within the approved development footprint and may not be								

Potential Impact: Construction of infrastructure	Magnitude	Extent	Reversibility	Duration	Probability	Significance	Character
	undertaken on bare soil. ▪ Mixing of concrete is to be strictly undertaken within a lined, bound or bunded portable mixer. Consideration must be given to the use of ready mix concrete. ▪ A batter board or other suitable platform/mixing tray is to be provided onto which any mixed concrete can be deposited whilst it awaits placing. ▪ A washout area should be designated within the approved development footprint and wash water should be treated on-site or discharged to a suitable sanitation system. ▪ Any cement bags must be disposed of in the demarcated hazardous waste receptacles. ▪ Concrete spillage outside of the areas of application must be promptly removed and taken to a suitably licensed waste disposal site. ▪ Sediment traps must also be installed downstream/downgradient of the construction area. ▪ Sediment traps can be created by pegging an appropriate geotextile across the entire width of the work area at the specified support structure, held down by cobbles/boulders or by geotextile wrapped hay bales spanning the width of the work area and staked into position. ▪ During excavation of the foundations to facilitate support structures, soil must be stockpiled upgradient of the excavated pits. Mixture of the lower and upper layers of the excavated soil must be kept to a minimum. This soil must be used to close off the pits, immediately after installation of the support structures. ▪ The transformers associated with the proposed facility substation area is to be fenced off to reduce the impacts on the downgradient freshwater ecosystems, should a spill occur. ▪ Most Lithium ion batteries are factory sealed and no additional hazardous or toxic chemicals are required. However, potential containment loss of hazardous substances could lead to soil and water pollution. As such, the correct installation, handling and use of the batteries as per the regulated guidelines must be implemented (as per the SANS 56005:2022 Ed 1 as issued in Schedule B1 of GN 1427 of 18 November 2022, as issued in terms of section 24(1)(a) of the Standards Act (act 8 of 2008)) ▪ Should a leak occur, the ECO must be informed and the correct procedure (as per the EMPr) be followed.						

9.2.2 OPERATIONAL PHASE

The impact on the freshwater ecosystem habitat during the operational phase is indicated in **Table 9-15** and **Table 9-16**.

The proposed Tournée 2 Solar PV Facility and associated infrastructure has been acceptably designed to optimally avoid the identified freshwater ecosystems and the associated NEMA 32m ZoR, which is deemed the minimum mitigation measure to minimise potential impacts on the freshwater ecosystems. This will optimally ensure increased protection from the risk of the potential increase in sedimentation and erosion from the removal and clearing of natural terrestrial vegetation in close proximity (less than 40m) to the CVB wetland. This is deemed particularly pertinent since bi-facial solar panel technology is being proposed, which requires that the area where the solar panels are placed be kept clear of vegetation during the operational phase.

Table 9-15 – Impact on Impact on ecosystem habitat during the operational phase

Potential Impact: Operation and Maintenance	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	1	1	4	3	**21**	**Low**	(-)
With Mitigation	1	1	1	4	2	**14**	**Very Low**	(-)
Mitigation and Management Measures	▪ Maintenance vehicles must make use of dedicated access roads and no indiscriminate off-road driving or movement unless authorised for maintenance activities may be permitted. ▪ Regular inspection of the batteries and transformers (associated with the substation) should be undertaken for leaks. If leaks are encountered, the relevant competent person should be informed and immediately rectified. ▪ During periodic maintenance activities of the surface infrastructure, monitoring for erosion should be undertaken with specific mention of investigating the support structures and areas accessed to facilitate maintenance activities. ▪ Should erosion be noted at the base of the support structures the areas must be rehabilitated by infilling and resurfacing of disturbed areas and revegetating these areas with suitable indigenous vegetation. ▪ Monitoring for the establishment of AIPs within the development footprint and along access roads must be undertaken. ▪ Should AIPs be identified, they must be removed and disposed of as per an approved AIP control plan and the area must be revegetated with suitable indigenous vegetation.							

Table 9-16 – Impact on ecosystem habitat during the operational phase

Potential Impact: Discharge of water from access roads	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	3	4	3	33	Moderate	(-)
With Mitigation	2	1	1	4	1	8	Very Low	(-)
Mitigation and Management Measures	▪ A formal Stormwater Management Plan (SWMP) must be designed by a suitably qualified engineer/hydrologist which must consider the increased runoff potential and increased sedimentation potential of the areas permanently kept clear of vegetation (i.e. array footprint area). ▪ Regular inspection of the stormwater outlet structures should be undertaken (specifically after large storm events) in order to monitor the occurrence of erosion. ▪ If erosion has occurred, it should immediately be rehabilitated through stabilisation of embankments and revegetation. ▪ Only indigenous vegetation species may be used as part of the rehabilitation process and invasive plant species should be eradicated.							

9.2.3 DECOMMISSIONING PHASE

The impact on the freshwater ecosystem habitat during the decommissioning phase is indicated in **Table 9-17**.

Table 9-17 – Impact on ecosystem habitat during the decommissioning phase

Potential Impact: Closure of the project and rehabilitation of the footprint area	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	1	1	2	2	10	Very Low	(-)
With Mitigation	1	1	1	1	2	8	Very Low	(-)
Mitigation and Management Measures	▪ Material associated with the Lithium-ion batteries and substation transformers must be disposed of at a registered hazardous landfill site. ▪ All rehabilitation activities, including vehicle movement and construction activities by personal, must not occur within the identified freshwater ecosystems and associated NEMA 32m ZoR. ▪ All bare areas should be revegetated with suitable indigenous vegetation species.							

9.3 PLANT SPECIES IMPACT ASSESSMENT

The following impact assessment on the floral species on the site is broken down into the three habitats found on the site namely, Grassland, Transformed and Fresh water habitats, and each of the parts of infrastructure in relation to each habitat.

9.3.1 PRE-CONSTRUCTION PHASE

The following impacts could potentially arise as a result of poor planning: Potential failure to develop an AIP Management/Control plan before the commencement of activities; Potential inadequate design and management planning of stormwater and erosion; and Potential inconsiderate design of surface infrastructure layouts within sensitive habitat and/or species localities and/or recommended buffers.

Table 9-18 – Impacts on the grassland habitat with Associated Infrastructure

Potential Impact: Loss of favourable floral habitat beyond the authorised footprint, leading to a decline in floral diversity; Loss of sensitive habitat and /or fragmentation of vegetation communities; Increased risk of erosion and loss of topsoil; Potential increase in fragmentation of vegetation communities and disruption of natural dispersal processes; Potential increase in fragmentation of ecological corridors and diminished ecological functionality.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	3	2	3	**27**	**Low**	(-)
With Mitigation	2	1	3	2	2	**16**	**Low**	(-)
Mitigation and Management Measures	▪ At all times, ensure that sound environmental management is in place during the planning phase; ▪ The design plans should take cognisance of sensitive habitats described during the EIA phase, in line with the DFFE mitigation hierarchy. As far as feasibly possible, sensitive habitats (32 m surrounding the Freshwater Ecosystems and must be excluded from the proposed activities; ▪ Development should be prioritised in habitats of decreased sensitivity; ▪ Access roads should be kept to existing roads were possible so to reduce further fragmentation of existing natural habitat; ▪ A rehabilitation plan should be developed that will promote habitat reinstatement in disturbed sites and allow for increased habitat connectivity during the operation and maintenance phase of the project; ▪ The placement of pylons for the interconnected OHPL will need to be optimised to avoid any footprint areas within							

	the Freshwater Ecosystems ▪ A Stormwater management plan should be developed to ensure sound stormwater design and management planning.

The following impacts are associated with Surface infrastructure and include the Developable areas.

Table 9-19 – Impacts on the grassland habitat with Surface infrastructure and include the Developable areas

Potential Impact: Loss of favourable floral habitat beyond the authorised footprint, leading to a decline in floral diversity; **Loss of sensitive habitat and /or fragmentation of vegetation communities;** **Increased risk of erosion and loss of topsoil;** **Potential increase in fragmentation of vegetation communities and disruption of natural dispersal processes;** **Potential increase in fragmentation of ecological corridors and diminished ecological functionality.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	4	2	3	2	3	**33**	**Moderate**	(-)
With Mitigation	2	2	3	2	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ At all times, ensure that sound environmental management is in place during the planning phase; ▪ The design plans should take cognisance of sensitive habitats described during the EIA phase, in line with the DFFE mitigation hierarchy. As far as feasibly possible, sensitive habitats (32 m surrounding the Freshwater Ecosystems and must be excluded from the proposed activities; ▪ Development should be prioritised in habitats of decreased sensitivity; ▪ Access roads should be kept to existing roads were possible so to reduce further fragmentation of existing natural habitat; ▪ A rehabilitation plan should be developed that will promote habitat reinstatement in disturbed sites and allow for increased habitat connectivity during the operation and maintenance phase of the project; ▪ A Stormwater management plan should be developed to ensure sound stormwater design and management planning. ▪ The placement of pylons for the interconnected								

	OHPL will need to be optimised to avoid any footprint areas within the Freshwater Ecosystems

The following impacts are associated with the linear developments.

Table 9-20 – Impacts on the grassland habitat with Linear development: Access roads; Internal roads and Interconnected OHPL

Potential Impact: Loss of favourable floral habitat beyond the authorised footprint, leading to a decline in floral diversity; **Loss of sensitive habitat and /or fragmentation of vegetation communities;** **Increased risk of erosion and loss of topsoil;** **Potential increase in fragmentation of vegetation communities and disruption of natural dispersal processes;** **Potential increase in fragmentation of ecological corridors and diminished ecological functionality.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	2	3	2	3	**30**	**Low**	(-)
With Mitigation	2	2	3	2	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ At all times, ensure that sound environmental management is in place during the planning phase; ▪ The design plans should take cognisance of sensitive habitats described during the EIA phase, in line with the DFFE mitigation hierarchy. As far as feasibly possible, sensitive habitats (32 m surrounding the Freshwater Ecosystems must be excluded from the proposed activities; ▪ Development should be prioritised in habitats of decreased sensitivity; ▪ Access roads should be kept to existing roads were possible so to reduce further fragmentation of existing natural habitat; ▪ A rehabilitation plan should be developed that will promote habitat reinstatement in disturbed sites and allow for increased habitat connectivity during the operation and maintenance phase of the project; ▪ A Stormwater management plan should be developed to ensure sound stormwater design and management planning. ▪ The placement of pylons for the interconnected OHPL will need to be optimised to avoid any footprint areas within the Freshwater Ecosystems								

Table 9-21 – Impacts on the Transformed habitat with Associated Infrastructure: Laydown area.

Potential Impact: Loss of favourable floral habitat beyond the authorised footprint, leading to a decline in floral diversity; Loss of sensitive habitat and /or fragmentation of vegetation communities; Increased risk of erosion and loss of topsoil; Potential increase in fragmentation of vegetation communities and disruption of natural dispersal processes; Potential increase in fragmentation of ecological corridors and diminished ecological functionality.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	1	2	3	18	Low	(-)
With Mitigation	2	1	1	2	2	12	Very low	(-)
Mitigation and Management Measures	▪ At all times, ensure that sound environmental management is in place during the planning phase; ▪ The design plans should take cognisance of sensitive habitats described during the EIA phase, in line with the DFFE mitigation hierarchy. As far as feasibly possible, sensitive habitats (32 m surrounding the Freshwater must be excluded from the proposed activities; ▪ Development should be prioritised in habitats of decreased sensitivity; ▪ Access roads should be kept to existing roads were possible so to reduce further fragmentation of existing natural habitat; ▪ A rehabilitation plan should be developed that will promote habitat reinstatement in disturbed sites and allow for increased habitat connectivity during the operation and maintenance phase of the project; ▪ A Stormwater management plan should be developed to ensure sound stormwater design and management planning.							

Table 9-22 – Impacts on the Transformed habitat with Surface infrastructure: Developable areas.

Potential Impact: Loss of favourable floral habitat beyond the authorised footprint, leading to a decline in floral diversity; Loss of sensitive habitat and /or fragmentation of vegetation communities; Increased risk of erosion and loss of topsoil; Potential increase in fragmentation of vegetation communities and disruption of natural dispersal processes; Potential increase in fragmentation of ecological corridors and diminished ecological functionality.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	2	3	**21**	**Low**	(-)
With Mitigation	2	2	1	2	2	**14**	**Very low**	(-)
Mitigation and Management Measures	▪ At all times, ensure that sound environmental management is in place during the planning phase; ▪ The design plans should take cognisance of sensitive habitats described during the EIA phase, in line with the DFFE mitigation hierarchy. As far as feasibly possible, sensitive habitats (32 m surrounding the Freshwater Ecosystems must be excluded from the proposed activities; ▪ Development should be prioritised in habitats of decreased sensitivity; ▪ Access roads should be kept to existing roads were possible so to reduce further fragmentation of existing natural habitat; ▪ A rehabilitation plan should be developed that will promote habitat reinstatement in disturbed sites and allow for increased habitat connectivity during the operation and maintenance phase of the project; ▪ A Stormwater management plan should be developed to ensure sound stormwater design and management planning.							

Table 9-23 – Impacts on the Transformed habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Loss of favourable floral habitat beyond the authorised footprint, leading to a decline in floral diversity; Loss of sensitive habitat and /or fragmentation of vegetation communities; Increased risk of erosion and loss of topsoil; Potential increase in fragmentation of vegetation communities and disruption of natural dispersal processes; Potential increase in fragmentation of ecological corridors and diminished ecological functionality.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	1	2	3	**18**	**Low**	(-)
With Mitigation	1	1	1	2	2	**10**	**Very low**	(-)
Mitigation and Management Measures	▪ At all times, ensure that sound environmental management is in place during the planning phase; ▪ The design plans should take cognisance of sensitive habitats described during the EIA phase, in line with the DFFE mitigation hierarchy. As far as feasibly possible, sensitive habitats (32 m surrounding the Freshwater must be excluded from the proposed activities; ▪ Development should be prioritised in habitats of decreased sensitivity; ▪ Access roads should be kept to existing roads were possible so to reduce further fragmentation of existing natural habitat; ▪ A rehabilitation plan should be developed that will promote habitat reinstatement in disturbed sites and allow for increased habitat connectivity during the operation and maintenance phase of the project; ▪ A Stormwater management plan should be developed to ensure sound stormwater design and management planning.							

Table 9-24 – Impacts on the Freshwater Ecosystems with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Loss of favourable floral habitat beyond the authorised footprint, leading to a decline in floral diversity; Loss of sensitive habitat and /or fragmentation of vegetation communities; Increased risk of erosion and loss of topsoil; Potential increase in fragmentation of vegetation communities and disruption of natural dispersal processes; Potential increase in fragmentation of ecological corridors and diminished ecological functionality.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	3	2	3	33	Moderate	(-)
With Mitigation	2	1	3	2	2	16	Low	(-)
Mitigation and Management Measures	▪ At all times, ensure that sound environmental management is in place during the planning phase; ▪ The design plans should take cognisance of sensitive habitats described during the EIA phase, in line with the DFFE mitigation hierarchy. As far as feasibly possible, sensitive habitats ▪ Development should be prioritised in habitats of decreased sensitivity; ▪ Access roads should be kept to existing roads were possible so to reduce further fragmentation of existing natural habitat; ▪ A rehabilitation plan should be developed that will promote habitat reinstatement in disturbed sites and allow for increased habitat connectivity during the operation and maintenance phase of the project; ▪ A Stormwater management plan should be developed to ensure sound stormwater design and management planning.								

Table 9-25 – Impacts on the Grassland habitat with Threatened Floral SCC

Potential loss of habitat for SCC through inconsiderate planning of layout placement Potential unmitigated loss of floral SCC.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	5	3	4	44	Moderate	(-)
With Mitigation	1	1	3	3	3	24	Low	(-)

Mitigation and Management Measures	- Impact must be limited to the footprint area and kept to what is essential only; - A walkdown of the footprint area is required before construction activities can commence, where all anticipated floral SCC are searched and marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities; - Should any floral species protected under NEMBA or NFA be encountered within the Tournée 1 Solar PV Park and proposed development footprint areas, authorisation to relocate such species must be obtained from the DFFE. Where any threatened floral SCC are present within the footprint areas, it is recommended that they be avoided (first and foremost) and only rescued and relocated if the project is authorised and the species will be impacted by the proposed activities. - Should any provincially protected species be impacted by the proposed Tournée 2 Solar PV Facility footprint areas, the necessary permits should be obtained from regulatory government agencies within the MTPA; - The rescue and relocation of any floral SCC must be undertaken by a suitably qualified specialist, either to suitable habitat (outside the development) yet within the Tournée 2 Solar PV Park, or to registered nurseries such as the Agricultural - Research Council (ARC) or the SANBI; - Should any provincially protected specie be impacted by the proposed Tournée 2 Solar PV Park footprint areas, the necessary permits should be obtained from regulatory government agencies within the MTPA; - A plant Rescue and Relocation plan should be developed and implemented to monitor the success (or failure) of relocation activities, by collecting data regarding the condition of any relocated species (along with photographic evidence), and monitoring should continue through all phase of the Tournée 2 Solar PV Facility (including decommission and rehabilitation); - No collection of floral SCC must be allowed; and - Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area.

Table 9-26 – Impacts on the Grassland habitat with Protected Floral SCC

Potential loss of habitat for SCC through inconsiderate planning of layout placement **Potential unmitigated loss of floral SCC.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	1	5	3	5	**55**	**Moderate**	(-)
With Mitigation	1	1	3	3	3	**24**	**Low**	(-)
Mitigation and Management Measures	▪ Impact must be limited to the footprint area and kept to what is essential only; ▪ A walkdown of the footprint is required before construction activities can commence, where all anticipated floral SCC are searched and marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities; ▪ Should any floral species protected under NEMBA or NFA be encountered within the Tournée 1 Solar PV Park and proposed development footprint areas, authorisation to relocate such species must be obtained from the DFFE. Where any threatened floral SCC are present within the footprint areas, it is recommended that they be avoided (first and foremost) and only rescued and relocated if the project is authorised and the species will be impacted by the proposed activities. ▪ Should any provincially protected species be impacted by the proposed Tournée 2 Solar PV Facility footprint areas, the necessary permits should be obtained from regulatory government agencies within the MTPA; ▪ The rescue and relocation of any floral SCC must be undertaken by a suitably qualified specialist, either to suitable habitat (outside the development) yet within the Tournée 2 Solar PV Facility, or to registered nurseries such as the Agricultural ▪ Research Council (ARC) or the SANBI; ▪ Should any provincially protected specie be impacted by the proposed Tournée 2 Solar PV Facility footprint areas, the necessary permits should be obtained from regulatory government agencies within the MTPA; ▪ A plant Rescue and Relocation plan should be developed and implemented to monitor the success (or failure) of relocation activities, by collecting data regarding the condition of any relocated species (along with photographic evidence), and monitoring should continue through all phase of the Tournée 2 Solar PV Facility (including decommission and rehabilitation); ▪ No collection of floral SCC must be allowed; and								

	▪ Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area.

Table 9-27 – Impacts on the Freshwater ecosystems with Threatened Floral SCC

Potential loss of habitat for SCC through inconsiderate planning of layout placement **Potential unmitigated loss of floral SCC.**	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	5	3	4	**44**	**Moderate**	(-)
With Mitigation	1	1	3	3	3	**24**	**Low**	(-)
Mitigation and Management Measures	▪ Impact must be limited to the footprint area and kept to what is essential only; ▪ A walkdown of the footprint area is required before construction activities can commence, where all anticipated floral SCC are searched and marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities; ▪ Should any floral species protected under NEMBA or NFA be encountered within the Tournée 2 Solar PV Facility and proposed development footprint areas, authorisation to relocate such species must be obtained from the DFFE. Where any threatened floral SCC are present within the footprint areas, it is recommended that they be avoided (first and foremost) and only rescued and relocated if the project is authorised and the species will be impacted by the proposed activities. The recommended exclusion buffers must be considered for layout designs ▪ Should any provincially protected species be impacted by the proposed Tournée 2 Solar PV Facility footprint areas, the necessary permits should be obtained from regulatory government agencies within the MTPA; ▪ The rescue and relocation of any floral SCC must be undertaken by a suitably qualified specialist, either to suitable habitat (outside the development) yet within the Tournée 2 Solar PV Facility, or to registered nurseries such as the Agricultural								

	▪ Research Council (ARC) or the SANBI; ▪ Should any provincially protected specie be impacted by the proposed Tournée 2 Solar PV Facility footprint areas, the necessary permits should be obtained from regulatory government agencies within the MTPA; ▪ A plant Rescue and Relocation plan should be developed and implemented to monitor the success (or failure) of relocation activities, by collecting data regarding the condition of any relocated species (along with photographic evidence), and monitoring should continue through all phase of the Tournée 2 Solar PV Facility (including decommission and rehabilitation); ▪ No collection of floral SCC must be allowed; and ▪ Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area.

Table 9-28 – Impacts on the freshwater ecosystems with Protected Floral SCC

Potential loss of habitat for SCC through inconsiderate planning of layout placement **Potential unmitigated loss of floral SCC.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	1	5	3	3	**30**	**Low**	(-)
With Mitigation	1	1	3	3	2	**16**	**Low**	(-)
Mitigation and Management Measures	▪ Impact must be limited to the footprint area and kept to what is essential only; ▪ A walkdown of the footprint area is required before construction activities can commence, where all anticipated floral SCC are searched and marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities; ▪ Should any floral species protected under NEMBA or NFA be encountered within the Tournée 2 Solar PV Facility and proposed development footprint areas, authorisation to relocate such species must be obtained from the DFFE. Where any threatened floral SCC are present within the footprint areas, it is							

	recommended that they be avoided (first and foremost) and only rescued and relocated if the project is authorised and the species will be impacted by the proposed activities. The recommended exclusion buffers must be considered for layout designs ▪ Should any provincially protected species be impacted by the proposed Tournée 2 Solar PV Facility footprint areas, the necessary permits should be obtained from regulatory government agencies within the MTPA; ▪ The rescue and relocation of any floral SCC must be undertaken by a suitably qualified specialist, either to suitable habitat (outside the development) yet within the Tournée 2 Solar PV Facility, or to registered nurseries such as the Agricultural ▪ Research Council (ARC) or the SANBI; ▪ Should any provincially protected specie be impacted by the proposed Tournée 2 Solar PV Facility footprint areas, the necessary permits should be obtained from regulatory government agencies within the MTPA; ▪ A plant Rescue and Relocation plan should be developed and implemented to monitor the success (or failure) of relocation activities, by collecting data regarding the condition of any relocated species (along with photographic evidence), and monitoring should continue through all phase of the Tournée 2 Solar PV Facility (including decommission and rehabilitation); ▪ No collection of floral SCC must be allowed; and ▪ Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area.

9.3.2 CONSTRUCTION PHASE

The construction phase will have the following impacts on the habitats: Vegetation clearing and construction activities will lead to habitat destruction and disturbance within the direct footprint area.

Placement of infrastructure in close proximity to sensitive habitat (i.e., Freshwater Ecosystems) may lead to footprint creep impacting on sensitive habitat. Changes in surface characteristics may lead to increased runoff and erosion. Introduction of foreign material (e.g., soil) during construction activities may lead to the further introduction of alien invader species.

Failure to implement an alien floral control plan may result in widespread AIP proliferation.

Ineffective removal and control of AIP species, and poor rehabilitation of exposed areas could lead to re-establishment of invasive species.

Compaction of soil due to the movement of construction vehicles (especially within Freshwater Ecosystems); Alteration of runoff patterns; Disturbance of soil leading to increased AIP proliferation; Risk of contamination from all construction activities which may pollute receiving environment. Probability of unplanned fires and Dust generation during construction and operation activities.

Table 9-29 – Impacts on the Grassland habitat with Associated Infrastructure: BESS; Concrete batching plant; Construction camp; Facility substation & Eskom collector station; Laydown area; O&M building and Paved areas.

- Loss of indigenous vegetation through vegetation clearing (specifically within the Grassland Habitat); - Decline of species diversity; - Loss of topsoil and seedbanks; - Soil-compaction, erosion and AIP proliferation within disturbed areas; - Loss of floral habitat and diversity; - Loss of floral habitat beyond the project footprint due potential footprint creep as a result from increased erosion; - Lowered photosynthetic abilities of nearby plants, decreasing optimal growth/re-establishment conditions due to dust pollution; - Potential decrease in floral diversity.	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	2	3	4	5	**60**	**Moderate**	(-)
With Mitigation	3	1	3	4	5	**55**	**Moderate**	(-)
Mitigation and Management Measures	▪ The construction footprint must be kept as small as possible to minimise the impact on the surrounding environment (edge effect management);							

	▪ Construction footprint areas should be clearly demarcated to monitor footprint extent and avoid footprint creep; ▪ Removal of vegetation must be restricted to what is necessary and should remain within the approved development footprint; ▪ Clearing of vegetation should take place in a phased manner if feasible as to keep bare soil areas as small as possible to limit the erosion potential; ▪ Access roads should be kept to existing roads as far as is feasible so to reduce fragmentation of existing natural habitat; ▪ Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of construction activities; ▪ No indiscriminate movement of construction vehicles or personnel are allowed in the Freshwater Habitat particularly during intense rainfall events as water may flow with greater intensity within these areas; ▪ Dust suppression must be undertaken as required and especially in dry seasons in order to mitigate the impact thereof on flora within a close proximity of construction activities; ▪ Care should be taken during the construction of the proposed development to limit edge effects to surrounding natural habitat. At minimum, this can be achieved by: (i) Demarcating all footprint areas during construction activities, (ii) No construction rubble or cleared AIPs are to be disposed of outside of demarcated areas and should be taken to a registered waste disposal facility and (iii) manage the spread of AIP species, which may affect remaining natural habitat within surrounding areas. Any areas that have been left bare or disturbed because of the construction activities should be rehabilitated using indigenous species. Ensure AIP vegetation cuttings/propagules are disposed of adequately, i.e., it must be ensured that the spread of these species is prevented. Designated spots for cuttings are highly recommended, or potentially make use of registered waste sites; ▪ No chemical control of AIP is permitted within the 32 m buffer of any Freshwater Ecosystem unless it has been approved as safe for use in wetlands by the Working for Water group, and the application of herbicide should only be carried out by suitably trained personnel; ▪ Roadsides and linear developments serve as common corridors along which alien and invasive floral species are introduced and dispersed. Therefore, an AIP control plan should be

	implemented along all linear disturbances; - No illicit fires must be allowed during the construction of the proposed development. A Fire Management Plan (FMP) should be set in place to ensure that any fires that do originate can be managed and / or stopped before significant damage to the environment occurs; - If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder floral rehabilitation later down the line. Spill kits should be kept on-site within workshops. In the event of a breakdown, maintenance of vehicles must take place with care, and the recollection of spillage should be practised, preventing the ingress of hydrocarbons into the topsoil. An emergency spill kit must be available at the plant and must take cognisance should any spill near any Freshwater Ecosystems in the vicinity of the infrastructure; - No dumping of general or hazardous waste should take place. If any spills occur, they should be immediately cleaned up, and be disposed of at a registered waste facility; - Special attention should be paid to AIP control within these areas; - Avoid soil sealing (i.e., the destruction or covering of the ground by an impermeable material). Ensure that a vegetation layer is maintained (where possible). In this regard, use of indigenous plants from the reference vegetation type is recommended for best biodiversity outcomes; and - The design of internal access roads should consider semi-permeable surfaces that allow continuation of nutrient cycling

Table 9-30 – Impacts on the Grassland habitat with Surface infrastructure: Developable areas.

- Loss of indigenous vegetation through vegetation clearing (specifically within the Grassland Habitat); - Decline of species diversity; - Loss of topsoil and seedbanks; - Soil-compaction, erosion and AIP proliferation within disturbed areas; - Loss of floral habitat and diversity; - Loss of floral habitat beyond the project footprint due potential footprint creep as a result from increased erosion; - Lowered photosynthetic abilities of nearby plants, decreasing optimal growth/re-establishment conditions due to dust pollution; - Potential decrease in floral diversity.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	5	3	3	4	5	75	High	(-)
With Mitigation	4	2	3	4	5	65	High	(-)
Mitigation and Management Measures	▪ Refer to the Table above for the associated impacts							

Table 9-31 – Impacts on the Grassland habitat with Linear development: Access roads; Internal roads and Interconnected OHPL

- Loss of indigenous vegetation through vegetation clearing (specifically within the Grassland Habitat); - Decline of species diversity; - Loss of topsoil and seedbanks; - Soil-compaction, erosion and AIP proliferation within disturbed areas; - Loss of floral habitat and diversity; - Loss of floral habitat beyond the project footprint due potential footprint creep as a result from increased erosion; - Lowered photosynthetic abilities of nearby plants, decreasing optimal growth/re-establishment conditions due to dust pollution; - Potential decrease in floral diversity.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	4	5	60	Moderate	(-)
With Mitigation	3	1	3	4	5	55	Moderate	(-)
Mitigation and Management Measures	▪ Refer to the Table above for the associated impacts							

Table 9-32 – Impacts on the Transformed habitat with Associated Infrastructure: Laydown area

- Loss of indigenous vegetation through vegetation - Decline of species diversity; - Loss of topsoil and seedbanks; - Soil-compaction, erosion and AIP proliferation within disturbed areas; - Loss of floral habitat and diversity; - Loss of floral habitat beyond the project footprint due potential footprint creep as a result from increased erosion; - Lowered photosynthetic abilities of nearby plants, decreasing optimal growth/re-establishment conditions due to dust pollution; - Potential decrease in floral diversity.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	1	1	1	5	20	Low	(-)

With Mitigation	1	1	1	1	3	**12**	**Very Low**	(-)
Mitigation and Management Measures	▪ Refer to the Table above for the associated impacts							

Table 9-33 – Impacts on the Transformed habitat with Surface infrastructure: Developable areas

- Loss of indigenous vegetation through vegetation **- Decline of species diversity;** **- Loss of topsoil and seedbanks;** **- Soil-compaction, erosion and AIP proliferation within disturbed areas;** **- Loss of floral habitat and diversity;** **- Loss of floral habitat beyond the project footprint due potential footprint creep as a result from increased erosion;** **- Lowered photosynthetic abilities of nearby plants, decreasing optimal growth/re-establishment conditions due to dust pollution;** **- Potential decrease in floral diversity.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**		**Significance**	**Character**
Without Mitigation	1	1	1	1	5	**20**	**Low**	(-)
With Mitigation	1	1	1	1	3	**12**	**Very Low**	(-)
Mitigation and Management Measures	▪ Refer to the Table above for the associated impacts							

Table 9-34 – Impacts on the Transformed habitat with Linear development: Access roads; Internal roads; and Interconnected OHPL

- Loss of indigenous vegetation through vegetation - Decline of species diversity; - Loss of topsoil and seedbanks; - Soil-compaction, erosion and AIP proliferation within disturbed areas; - Loss of floral habitat and diversity; - Loss of floral habitat beyond the project footprint due potential footprint creep as a result from increased erosion; - Lowered photosynthetic abilities of nearby plants, decreasing optimal growth/re-establishment conditions due to dust pollution; - Potential decrease in floral diversity.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	1	1	1	5	20	Low	(-)
With Mitigation	1	1	1	1	3	12	Very Low	(-)
Mitigation and Management Measures	▪ Refer to the Table above for the associated impacts							

Table 9-35 – Impacts on the Freshwater ecosystems habitat with Surface infrastructure: Developable areas

- Loss of indigenous vegetation through vegetation - Decline of species diversity; - Loss of topsoil and seedbanks; - Soil-compaction, erosion and AIP proliferation within disturbed areas; - Loss of floral habitat and diversity; - Loss of floral habitat beyond the project footprint due potential footprint creep as a result from increased erosion; - Lowered photosynthetic abilities of nearby plants, decreasing optimal growth/re-establishment conditions due to dust pollution; - Potential decrease in floral diversity.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	3	3	4	40	Moderate	(-)
With Mitigation	3	1	3	3	3	30	Low	(-)
Mitigation and Management Measures	▪ Refer to the Table above for the associated impacts							

Table 9-36 – Impacts on the Freshwater ecosystems habitat with Linear development: Internal roads.

- Loss of indigenous vegetation through vegetation - Decline of species diversity; - Loss of topsoil and seedbanks; - Soil-compaction, erosion and AIP proliferation within disturbed areas; - Loss of floral habitat and diversity; - Loss of floral habitat beyond the project footprint due potential footprint creep as a result from increased erosion; - Lowered photosynthetic abilities of nearby plants, decreasing optimal growth/re-establishment conditions due to dust pollution; - Potential decrease in floral diversity.	Magnitude	Extent	Reversibility	Duration	Probability	Significance	Character

Without Mitigation	3	1	3	3	4	**40**	**Moderate**	(-)
With Mitigation	3	1	1	3	3	**24**	**Low**	(-)
Mitigation and Management Measures	▪ Refer to the Table above for the associated impacts							

The construction impacts associated are as follows: Vegetation clearing compromising suitable conditions for floral SCC to establish successfully. Footprint creep leading to additional loss of SCC habitat and floral SCC species. Failure to have conducted a floral walkdown and where necessary floral rescue and relocation prior to construction actives. Potential ineffective monitoring of relocated SCC and Unnecessary or unlawful destruction/removal of floral SCC and protected species.

Table 9-37 – Impacts on the Grassland habitat with Threatened Floral SCC

- Loss of habitat for SCC through site clearing; **- Potential loss of floral SCC.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	2	3	4	3	**33**	**Moderate**	(-)
With Mitigation	2	1	3	4	2	**20**	**Low**	(-)
Mitigation and Management Measures	▪ Impact must be limited to the footprint area and kept to what is essential only; ▪ If any floral SCC are found during the Construction phase, that was missed during the floral walkdown, these individuals should be marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities; ▪ Monitor, where applicable, the success or failures of relocated floral SCC; ▪ Demarcate and monitor the floral SCC populations outside of the footprint areas to ensure construction activities do not infringe onto these species; ▪ No collection of floral SCC must be allowed; and ▪ Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area.							

Table 9-38 – Impacts on the Grassland habitat with Protected Floral SCC

- Loss of habitat for SCC through site clearing; - Potential loss of floral SCC.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	5	55	Moderate	(-)
With Mitigation	2	1	3	4	3	30	Low	(-)
Mitigation and Management Measures	▪ Refer to the Table above for the associated mitigation measures							

Table 9-39 – Impacts on the Freshwater Ecosystem habitat with Threatened Floral SCC

- Loss of habitat for SCC through site clearing; - Potential loss of floral SCC.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	3	33	Moderate	(-)
With Mitigation	2	1	3	4	2	20	Low	(-)
Mitigation and Management Measures	▪ Refer to the Table above for the associated mitigation measures							

Table 9-40 – Impacts on the Freshwater Ecosystem habitat with Protected Floral SCC

Potential loss of floral habitat beyond the project footprint; **- Potential loss of floral habitat and species diversity;** **- Potential loss of productive topsoil;** **- Potential loss of downslope vegetation communities; and** **- Potential loss of viable soils, increasing erosion risk and/or further exacerbating the proliferation of AIPs.**	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	2	**22**	**Low**	(-)
With Mitigation	2	1	3	4	1	**10**	**Very low**	(-)
Mitigation and Management Measures	▪ Refer to the Table above for the associated mitigation measures							

9.3.3 OPERATIONAL PHASE

The operational and maintenance phase will include the following potential impacts on the habitats, poorly managed stormwater management systems, leading to increase probability of soil erosion; Soil erosion, exacerbated by potentially inadequate stormwater management can lead to contamination of downstream freshwater ecosystems as a result of sedimentation. Potential footprint creep associated with operational activities. Potential unplanned fires resulting from Operational and Maintenance activities. Additional pressure on floral habitat by increased human populations associated with the proposed development activities, contributing to increases in the collection of plant material for medicinal purposes and promoting the introduction and spread of AIPs.

Risk of chemical contamination of soil, which can occur if herbicides are used to control vegetation growth under solar panels and risk of contamination from all operational facilities may pollute receiving environment.

Table 9-41 – Impacts on the Grassland habitat with Associated Infrastructure: BESS; Concrete batching plant; Construction camp; Facility substation & Eskom collector station; Laydown area; O&M building and Paved areas.

- Potential loss of floral habitat beyond the project footprint; **- Potential loss of floral habitat and species diversity;** **- Potential loss of productive topsoil;** **- Potential loss of downslope vegetation communities; and** **- Potential loss of viable soils, increasing erosion risk and/or further exacerbating the proliferation of AIPs.**	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	4	4	**48**	**Moderate**	(-)
With Mitigation	2	2	3	4	2	**22**	**Low**	(-)
Mitigation and Management Measures	▪ All areas of increased ecological sensitivity beyond the approved footprint must be designated as No-Go areas and be off-limits to all vehicles and personnel; ▪ No additional habitat is to be disturbed during the operational phase of the project outside of the demarcated approved footprints (being applied for); ▪ Monitor the Freshwater Habitat to ensure that floral communities are not degraded; ▪ Ongoing erosion and stormwater monitoring and control to be implemented throughout the Operational and Maintenance phase; ▪ The use of species-specific control methods and mechanical removal should be used to manage the regrowth if vegetation underneath solar panels; ▪ Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the operational activities; ▪ Manage the spread of AIP species, which may affect remaining natural habitat within surrounding areas; ▪ Ongoing AIP monitoring and clearing/control should take place throughout all phases of the project activities. The project perimeters should regularly be checked for AIP proliferation to prevent spread into surrounding natural areas; ▪ No illicit fires must be allowed during the operational phases; and ▪ Fire breaks should be maintained during the Operational and Maintenance phases.								

Table 9-42 – Impacts on the Grassland habitat with Surface infrastructure: Developable areas.

- Potential loss of floral habitat beyond the project footprint; - Potential loss of floral habitat and species diversity; - Potential loss of productive topsoil; - Potential loss of downslope vegetation communities; and - Potential loss of viable soils, increasing erosion risk and/or further exacerbating the proliferation of AIPs.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	3	4	4	52	Moderate	(-)
With Mitigation	3	2	3	4	2	24	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-43 – Impacts on the Grassland habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

- Potential loss of floral habitat beyond the project footprint; - Potential loss of floral habitat and species diversity; - Potential loss of productive topsoil; - Potential loss of downslope vegetation communities; and - Potential loss of viable soils, increasing erosion risk and/or further exacerbating the proliferation of AIPs.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	4	44	Moderate	(-)
With Mitigation	2	2	3	4	3	33	Moderate	(-)

Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures

Table 9-44 – Impacts on the Transformed habitat with Associated Infrastructure: Laydown area.

- Potential loss of floral habitat beyond the project footprint; - Potential loss of floral habitat and species diversity; - Potential loss of productive topsoil; - Potential loss of downslope vegetation communities; and - Potential loss of viable soils, increasing erosion risk and/or further exacerbating the proliferation of AIPs.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	1	1	5	1	8	Very low	(-)
With Mitigation	1	1	1	4	1	7	Very low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-45 – Impacts on the Transformed habitat with Surface infrastructure: Developable areas.

- Potential loss of floral habitat beyond the project footprint; - Potential loss of floral habitat and species diversity; - Potential loss of productive topsoil; - Potential loss of downslope vegetation communities; and - Potential loss of viable soils, increasing erosion risk and/or further exacerbating the proliferation of AIPs.	Magnitude	Extent	Reversibility	Duration	Probability	Significance	Character

Without Mitigation	1	1	1	5	1	**8**	**Very low**	(-)
With Mitigation	1	1	1	4	1	**7**	**Very low**	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-46 – Impacts on the Transformed habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

- Potential loss of floral habitat beyond the project footprint; **- Potential loss of floral habitat and species diversity;** **- Potential loss of productive topsoil;** **- Potential loss of downslope vegetation communities; and** **- Potential loss of viable soils, increasing erosion risk and/or further exacerbating the proliferation of AIPs.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	1	1	1	4	1	**7**	**Very low**	(-)
With Mitigation	1	1	1	4	1	**7**	**Very low**	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-47 – Impacts on the Freshwater ecosystems habitat with Surface infrastructure: Developable areas.

- Potential loss of floral habitat beyond the project footprint; - Potential loss of floral habitat and species diversity; - Potential loss of productive topsoil; - Potential loss of downslope vegetation communities; and - Potential loss of viable soils, increasing erosion risk and/or further exacerbating the proliferation of AIPs.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	4	3	36	Moderate	(-)
With Mitigation	3	2	3	4	2	24	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-48 – Impacts on the Freshwater ecosystems habitat Linear development: Access roads; Internal roads and Interconnected OHPL.

- Potential loss of floral habitat beyond the project footprint; - Potential loss of floral habitat and species diversity; - Potential loss of productive topsoil; - Potential loss of downslope vegetation communities; and - Potential loss of viable soils, increasing erosion risk and/or further exacerbating the proliferation of AIPs.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	1	4	4	36	Moderate	(-)
With Mitigation	2	1	1	2	3	24	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

The operational impacts on SCC are as follows: Continued AIP proliferation into the remaining favourable habitat of SCCs or within relocated sites (where applicable). Ineffective monitoring of relocated SCC and nursery specimens (where applicable). Harvesting of SCC and Unnecessary or unlawful destruction/removal of floral SCC and protected species.

Table 9-49 – Impacts on the Grassland habitat with Threatened Floral SCC

- Potential loss of habitat for SCC through habitat change. **-Potential loss of floral SCC.**	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	3	4	3	**30**	**Low**	(-)
With Mitigation	1	1	3	4	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ Any unauthorised collection of floral material is to be prohibited; ▪ Monitoring of any rescued and relocated floral SCC should commence during the construction phase and continue until it is evident that relocated species have successfully established and population are stable; ▪ Maintenance activities must ensure that floral SCC and protected flora (where present outside of the footprint areas) will not be adversely impacted; ▪ Harvesting of protected and threatened floral species by operational personnel should be strictly prohibited; and ▪ Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed development footprint area								

Table 9-50 – Impacts on the Grassland habitat with Protected Floral SCC

- Potential loss of habitat for SCC through habitat change. **-Potential loss of floral SCC.**	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	3	4	3	**30**	**Low**	(-)
With Mitigation	1	1	3	4	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-51 – Impacts on the Freshwater ecosystems habitat with Threatened Floral SCC

- Potential loss of habitat for SCC through habitat change. **-Potential loss of floral SCC.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	1	3	5	1	**12**	**Low**	(-)
With Mitigation	2	1	3	5	1		**Very Low**	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-52 – Impacts on the Freshwater ecosystems habitat with Protected Floral SCC

- Potential loss of habitat for SCC through habitat change. **-Potential loss of floral SCC.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	1	3	5	1	**24**	**Low**	(-)
With Mitigation	2	1	3	5	1	**11**	**Very Low**	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

9.3.4 DECOMMISSIONING PHASE

The following have been identified as potential imp ats during the decommissioning phase: Failure to monitor rehabilitation efforts. Failure to rehabilitate bare areas or disturbed sites, potentially resulting in loss of viable soils, increasing erosion risk and/or further permitting the proliferation of AIPs. Poorly managed stormwater management systems. Poorly implemented AIP management. Disturbance of soil profiles as part of the demolition activities. Potential poor management and failure to monitor rehabilitation efforts.

Table 9-53 – Impacts on the Grassland habitat with Associated Infrastructure: BESS; Concrete batching plant; Construction camp; Facility substation & Eskom collector station; Laydown area; O&M building and Paved areas.

- Loss of floral habitat and species diversity; - Loss of productive topsoil; - Landscapes left fragmented, resulting in reduced dispersal capabilities of floral species and an overall decrease in floral diversity; - Compacted soils limiting the re-establishment of natural vegetation; and - Increased risk of erosion in areas left disturbed.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	3	5	3	42	Moderate	(-)
With Mitigation	3	1	3	3	2	20	Low	(-)
Mitigation and Management Measures	▪ Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the decommissioning activities; ▪ No dumping of litter, rubble or cleared vegetation on site must be allowed. Infrastructure and rubble generated during the decommissioning activities should be disposed of at an appropriate registered dump site. No temporary dump sites should be allowed in areas with natural vegetation. Waste disposal containers and bins should be provided during the decommissioning phase for all rubble and general waste. Vegetation cuttings must be carefully collected and disposed of at a separate waste facility; ▪ Ongoing AIP monitoring and clearing/control should take place throughout all phases of the project activities. The project perimeters should regularly be checked for AIP proliferation to prevent spread into surrounding natural areas; ▪ Management of AIPs during the Decommissioning phase activities must be focused on limiting their spread. For example, roadsides should be monitored, as they serve as common corridors along which AIP species are introduced and dispersed, and disturbed areas should regularly be monitored for AIP recruitment until successfully rehabilitated; ▪ Gravel form the Developable areas should be removed, as soon as PV panels are removed, and a							

	vegetation cover should be reinstated (using naturally occurring species from surrounding areas or use of ecological suitable seed mixes incorporated). Bulbous and geophytes species (from the reference vegetation) should be reinstated into the rehabilitated vegetation to recover some ecological functioning of the grassland habitat; and ▪ Compacted soils will need to be tilled and the soils will potentially need additional nutrients to account for the altered nutrient cycles during the lifetime of the project.

Table 9-54 – Impacts on the Grassland habitat with Surface infrastructure: Developable areas.

- Loss of floral habitat and species diversity; **- Loss of productive topsoil;** **- Landscapes left fragmented, resulting in reduced dispersal capabilities of floral species and an overall decrease in floral diversity;** **- Compacted soils limiting the re-establishment of natural vegetation; and** **- Increased risk of erosion in areas left disturbed.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	4	3	3	5	3	**45**	**Moderate**	(-)
With Mitigation	3	2	3	3	2	**22**	**Low**	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-55 – Impacts on the Grassland habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

- Loss of floral habitat and species diversity; - Loss of productive topsoil; - Landscapes left fragmented, resulting in reduced dispersal capabilities of floral species and an overall decrease in floral diversity; - Compacted soils limiting the re-establishment of natural vegetation; and - Increased risk of erosion in areas left disturbed.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	5	3	39	Moderate	(-)
With Mitigation	2	1	3	3	2	18	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-56 – Impacts on the Transformed habitat with Associated Infrastructure Laydown area

- Loss of floral habitat and species diversity; - Loss of productive topsoil; - Landscapes left fragmented, resulting in reduced dispersal capabilities of floral species and an overall decrease in floral diversity; - Compacted soils limiting the re-establishment of natural vegetation; and - Increased risk of erosion in areas left disturbed.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	1	3	2	14	Very low	(-)
With Mitigation	1	1	1	2	1	5	Very low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-57 – Impacts on the Transformed habitat with Surface infrastructure: Developable areas

- Loss of floral habitat and species diversity; - Loss of productive topsoil; - Landscapes left fragmented, resulting in reduced dispersal capabilities of floral species and an overall decrease in floral diversity; - Compacted soils limiting the re-establishment of natural vegetation; and - Increased risk of erosion in areas left disturbed.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	3	2	20	Low	(-)
With Mitigation	1	2	3	2	1	8	Very low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-58 – Impacts on the Transformed habitat with Linear development: Access roads; Internal roads and Interconnected OHPL

- Loss of floral habitat and species diversity; - Loss of productive topsoil; - Landscapes left fragmented, resulting in reduced dispersal capabilities of floral species and an overall decrease in floral diversity; - Compacted soils limiting the re-establishment of natural vegetation; and - Increased risk of erosion in areas left disturbed.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	3	2	16	Low	(-)
With Mitigation	1	1	1	2	1	5	Very low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

The decommissioning phase could lead to Unnecessary or unlawful destruction/removal of floral SCC and protected species. Failure to rehabilitate bare areas or disturbed sites; Inadequate stormwater management resulting in loss of viable soils and potentially increasing erosion risk. AIP proliferation within the Tournée 2 Solar PV Park area and Ineffective monitoring of relocated SCC resulting in the loss of SCC within the Tournée 2 Solar PV Park area.

Table 9-59 – Impacts on Grassland the habitat with Threatened Floral SCC

- Potential loss of favourable habitat compromising of suitable conditions for floral SCC to establish successfully; and - Potential loss of floral SCC.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	3	3	33	Moderate	(-)
With Mitigation	2	1	3	2	2	16	Low	(-)
Mitigation and Management Measures	▪ Any unauthorised collection of floral material is to be prohibited during decommissioning activities; ▪ Harvesting of protected and threatened floral species personnel should be strictly prohibited; ▪ Edge effect control needs to be implemented to prevent further habitat degradation and potential loss of floral SCC where footprint areas are located (or demolished); and ▪ Floral SCC relocated during the Pre-construction phase of the development should be reinstated within the Tournée 2 Solar PV Facility area (where this is deemed appropriate based on the outcome of rehabilitation activities) as soon as the habitat is rehabilitated, and relocated floral SCC should be monitored to ensure success of translocation.								

Table 9-60 – Impacts on Grassland the habitat with Protected Floral SCC

- Potential loss of favourable habitat compromising of suitable conditions for floral SCC to establish successfully; and - Potential loss of floral SCC.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	2	1	30	Low	(-)
With Mitigation	2	1	3	1	2	14	Very low	(-)
Mitigation and Management Measures	▪ Any unauthorised collection of floral material is to be prohibited during decommissioning activities; ▪ Harvesting of protected and threatened floral species personnel should be strictly prohibited; ▪ Edge effect control needs to be implemented to								

	prevent further habitat degradation and potential loss of floral SCC where footprint areas are located (or demolished); and ▪ Floral SCC relocated during the Pre-construction phase of the development should be reinstated within the Tournée 2 Solar PV Facility area (where this is deemed appropriate based on the outcome of rehabilitation activities) as soon as the habitat is rehabilitated, and relocated floral SCC should be monitored to ensure success of translocation.

9.4 ANIMAL SPECIES IMPACT ASSESSMENT

The following impact assessment on the faunal species on the site is broken down into the three habitats found on the site namely, Grassland, Transformed and Fresh water habitats, and each of the parts of infrastructure in relation to each habitat.

9.4.1 PRE-CONSTRCUTION PHASE

Potential poor planning of vegetation clearing for the proposed Tournée 2 Solar PV Facility, which will lead to faunal habitat loss, species displacement and a decrease in faunal diversity. Potential increased mortality rates of fauna, due to not having mitigations in place to lower the risk of human-wildlife conflict caused by potential moving vehicle collisions and potential snaring / poaching within the proposed Tournée 2 Solar PV Facility. It is of the utmost importance that an AIP control and management plan be developed before construction of the proposed Tournée 2 Solar PV Facility commence, as the possible spread of AIPs and habitat fragmentation may lead to lower habitat integrity as secondary impacts. Potential inappropriate planning may lead to Loss of habitat connectivity and potential for increased faunal mortality rates as species become stuck in fences.

Table 9-61 – Impact on Grassland habitat with PV facility and associated infrastructure

Potential Impact: Loss of faunal SCC	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	4	2	3	2	4	**44**	**Moderate**	(-)
With Mitigation	2	2	3	2	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ Where possible, and feasible, all planning of access roads should be kept to existing roads so to reduce fragmentation of existing natural habitat; ▪ Minimise loss of indigenous vegetation where possible through planning and adherence to suitable layouts;							

	- It is considered imperative that the development area be optimised and that all sensitive areas be avoided as far as possible (Freshwater Ecosystem Habitat). This is in line with the DFFE (2013) mitigation hierarchy that stipulates high risk activities must be avoided first and foremost; - Perimeter fences must be designed in such a way so as to allow for small faunal species movement in and out of the Tournée 2 Solar PV Facility In this regard, the use of electric perimeter fencing is discouraged to ensure electrocution of species does not occur. Suitable measures to retain openings placed every 200m in the fence must allow for the movement of small species through the fence safely; - Design of infrastructure should be environmentally sound and all construction equipment to be utilised must be a good working condition, and all possible precautions taken to prevent potential faunal collisions and mechanical spills and/or leaks; - Prior to the commencement of construction activities, an authorised AIP Management/Control Plan should be compiled for implementation; - Prior to the commencement of construction activities on site, a rehabilitation plan should be developed; - At all times, ensure that sound environmental management is in place during the planning phase.

Table 9-62 – Impact on Grassland habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Loss of faunal SCC	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	3	30	Low	(-)
With Mitigation	2	2	3	2	2	18	Low	(-)
Mitigation and Management Measures	- Refer to the table above for the associated mitigation measures							

Table 9-63 – Impact on Transformed habitat with PV facility and associated infrastructure.

Potential Impact: Loss of faunal SCC	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	3	**27**	**Low**	(-)
With Mitigation	2	2	2	2	2	**16**	**Low**	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-64 – Impact on Transformed habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Loss of faunal SCC	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	1	2	3	**18**	**Low**	(-)
With Mitigation	1	1	1	2	2	**10**	**Very low**	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-65 – Impact on Grassland habitat with PV facility and associated infrastructure

Potential Impact: Loss of faunal SCC	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	5	3	4	**44**	**Moderate**	(-)
With Mitigation	1	1	3	3	3	**24**	**Low**	(-)
Mitigation and Management Measures	▪ Where possible, and feasible, all access roads should be kept to existing roads so to reduce fragmentation of existing natural habitat; ▪ Footprint areas should be kept as small as possible. Site boundaries should be clearly demarcated so as to ensure that vegetation beyond the authorised footprint is not cleared; ▪ Perimeter fences must be designed in such a way so as to allow for small faunal species movement in and out of the Tournée 2 Solar PV Facility. In this regard, the use of electric perimeter fencing is discouraged to ensure electrocution of species does not occur. Suitable measures to retain openings placed every 200m in the fence must allow for the movement of small species through the fence safely; ▪ A documented rescue and relocation plan of action must be in place prior to commencement of construction and operational activities so all personnel are aware of the requirements should a faunal SCC be encountered; ▪ Prior to vegetation clearing activities, the site should be inspected for the presence of SCC, including reptiles. If located, ▪ these species should be carefully rescued and relocated as per an approved rescue and relocation plan that must be developed; ▪ Permits are to be obtained from all relevant authorities prior to the relocation of any faunal SCC; ▪ Prior to the commencement of construction activities, an authorised AIP Management/Control Plan should be compiled for implementation; ▪ Prior to the commencement of construction activities on site, a rehabilitation plan should be developed.								

Table 9-66 – Impact on Grassland habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Loss of faunal SCC	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	5	3	5	55	Moderate	(-)
With Mitigation	1	1	3	3	3	24	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

9.4.2 CONSTRUCTION PHASE

The most significant impact will occur with the vegetation clearing for the proposed Tournée 2 Solar PV Facility, which will lead to faunal habitat loss, species displacement and a decrease in faunal diversity. Increased loss of habitat connectivity and ecological functioning due to unplanned and uncontrolled site clearing and removal of faunal habitat. Potential increased mortality rates of fauna, due to collision with moving vehicles, human-wildlife conflict (notably snakes) and potential snaring / poaching within the proposed Tournée 2 Solar PV Facility and along the access road. Possible spread of AIPs and habitat fragmentation may lead to lower habitat integrity as secondary impacts.

Table 9-67 – Impact on Grassland habitat with PV facility and associated infrastructure

Potential Impact: Loss of faunal habitat and potential species diversity	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	3	4	5	65	High	(-)
With Mitigation	3	2	3	4	5	60	Moderate	(-)
Mitigation and Management Measures	▪ Footprint areas should be kept as small as possible. Site boundaries should be clearly demarcated so as to ensure that vegetation beyond the authorised footprint is not cleared; ▪ No development should occur within the Freshwater Ecosystem Habitat or within the relevant zones of regulation around these features present within the proposed PV plant area. A corridor for the movement of fauna should be maintained within the proposed project footprint; ▪ Construction equipment should be restricted to							

	travelling only on designated roadways or within the intended development footprint to limit the ecological footprint of the development activities. Additional road construction should be limited to what is absolutely necessary, and the footprint thereof kept to a minimum; ▪ Access road for construction should be gravel. Post construction and before operation of PV plant permeable paving is recommended (e.g. grassblock) in areas where areas should be paved; ▪ Perimeter fences must be designed in such a way so as to allow for small faunal species movement in and out of the solar farm. In this regard, the use of electric perimeter fencing is discouraged to ensure electrocution of species does not occur. ▪ Suitable measures to retain openings placed every 200m in the fence must allow for the movement of small species through the fence safely; ▪ Care should be taken during the construction and before operation of the proposed development to limit edge effects to surrounding natural habitat. This can be achieved by: ▪ Demarcating all footprint areas during construction activities; ▪ No construction rubble or cleared alien invasive species are to be disposed of outside of demarcated areas, and should be taken to a registered waste disposal facility; ▪ All soil compacted as a result of construction activities (outside of the development footprint) should be ripped, profiled and reseeded; and ▪ Manage the spread of AIP species, which may affect remaining natural habitat within surrounding areas. ▪ Should any lights be installed they should face downwards to reduce the abundance of insects attracted to the night lights, this prey source may attract insects to the project areas and may increase bat collisions or electrocutions. Furthermore increased lighting will impose upon the nights darkness altering invertebrate movement. Lights should not be LED or white light; ▪ If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder floral rehabilitation later down the line and faunal recolonization. In the event of a breakdown, maintenance of vehicles must take place with care, and the collection of spillages should be practised preventing the ingress of hydrocarbons into the topsoil; ▪ No hunting/trapping or collecting of faunal species is

	allowed; ▪ No illicit fires must be allowed during the construction phase of the proposed development; ▪ A rehabilitation plan should be compiled by a suitable specialist. This rehabilitation plan should consider all development phases of the project indicating rehabilitation actions to be undertaken during, and once construction has been completed as well as ongoing rehabilitation during the operational phase of the project to ensure habitat for fauna is restored; ▪ Any natural areas beyond the development footprint, that have been affected by the construction activities, must be rehabilitated using indigenous plant species; ▪ Revegetation of disturbed areas should be carried out in order to restore habitat availability and minimise soil erosion and surface water runoff; ▪ When rehabilitating a footprint site, it is imperative that as far as possible the habitat that was present prior to disturbances is recreated, so that faunal species that were displaced by vegetation clearing activities are able to recolonize the rehabilitated area; ▪ Smaller species of invertebrates and reptiles are likely to be less mobile during colder periods, as such should any be observed in the footprint areas during clearing and operational activities, they are to be carefully and safely moved to an area of similar habitat outside of the disturbance footprint. Construction and Operational personnel are to be educated about these species and the need for their conservation. Harmless reptiles should be carefully relocated by a suitably nominated construction person. For larger venomous snakes, a suitable construction official should be contacted to affect the relocation of the species, should it not move off on its own; ▪ All faunal species rescued must be relocated to a suitable area, with similar habitat adjacent to the footprint area or within the property; ▪ Maintain habitat connectivity and corridors for species movement; ▪ Edge effect control needs to be implemented to ensure no further degradation and potential loss of faunal SCC outside of the proposed project footprint area. An on-site Environmental Control Office (ECO) should monitor and mitigate any edge effects throughout the life of the operation; ▪ No additional habitat is to be disturbed outside of

	the approved footprints areas. Weekly (recommended) to monthly (minimum requirement) monitoring and recording of the footprint areas must be done during the construction phase by the ECO and photographic records kept – special attention should also be paid to the potential increase and spread of AIPs; ▪ No dumping of waste on site should take place. As such it is advised that waste disposal containers and bins be provided during the construction phase for all dilapidates, rubble and general waste; ▪ At all times, ensure that sound environmental management is in place; ▪ It is recommended that after vegetation clearing during the construction phase, vegetation regrowth must be promoted while appropriately maintained so as not to create a safety or production risk, as this will create habitat for faunal species and will aid in preventing soil erosion.

Table 9-68 – Impact on Grassland habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Loss of faunal habitat and potential species diversity	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	3	3	4	5	70	High	(-)
With Mitigation	3	2	3	4	5	60	Moderate	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-69 – Impact on Transformed habitat with PV facility and associated infrastructure.

Potential Impact: Loss of faunal habitat and potential species diversity	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	1	2	5	30	Low	(-)
With Mitigation	1	1	1	2	5	25	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-70 – Impact on Freshwater ecosystems habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Loss of faunal habitat and potential species diversity	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	3	3	4	40	Moderate	(-)
With Mitigation	3	1	3	2	3	27	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-71 – Impact on Grassland habitat with PV facility and associated infrastructure

Potential Impact: Loss of faunal SCC	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	3	33	Moderate	(-)

With Mitigation	2	1	3	4	2	**20**	**Low**	(-)
Mitigation and Management Measures	- Edge effect control needs to be implemented to prevent further degradation and potential loss of faunal SCC habitat outside of the proposed development footprint; - Perimeter fences must be designed in such a way so as to allow for small faunal species movement in and out of the solar farm. In this regard, the use of electric perimeter fencing is discouraged to ensure electrocution of species does not occur. - Suitable measures to retain openings placed every 200m in the fence must allow for the movement of small species through the fence safely; - Prior to vegetation clearing activities, the site should be inspected for the presence of SCC, including reptiles. If located, these species should be carefully rescued and relocated as per an approved rescue and relocation plan that must be developed; - Permits are to be obtained from relevant authorities prior to the relocation of any faunal SCC; - Smaller species such as reptiles are likely to be less mobile during the colder period, as such should any be observed in the study site during construction activities, they are to be carefully and safely moved to an area of similar habitat outside of the disturbance footprint. Construction personnel are to be educated about these species and the need for their conservation. - Harmless scorpion or reptiles should be carefully relocated by a nominated construction person or staff member. For venomous snakes or scorpions, a suitably trained official or specialist should be contacted to affect the relocation of the species, should it not move off on its own; - A suitable rescue and relocation plan should be developed and overseen by a suitably qualified specialist should SCC be identified within the project areas in order to ensure that species loss during construction activities is kept to a minimum; - No collection or hunting of any fauna species is to be allowed by personnel during the construction phase, especially with regards to faunal SCC (if encountered and not part of a rescue/relocation plan); - No unauthorised fires are to be allowed on the site; - Minimise loss of indigenous vegetation where possible through the planning of suitable faunal corridors. As far as possible layouts must avoid placement within habitat of increased sensitivity; - The development footprint is to be located outside the Freshwater Ecosystem Habitat or within the							

	relevant zones of regulation around these features. Edge effect control needs to be implemented to ensure no further degradation and potential loss of faunal habitat and SCC outside of the footprint area. An on-site ECO should monitor and mitigate any edge effects throughout the operation; ▪ It is recommended that after vegetation clearing during the construction phase, vegetation regrowth must be promoted while appropriately maintained so as not to create a safety or production risk, as this will create habitat for faunal SCC and will aid in preventing soil erosion.

Table 9-72 – Impact on Grassland habitat with Linear development: Access roads and Interconnected OHPL.

Potential Impact: Loss of faunal SCC	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	5	55	Moderate	(-)
With Mitigation	2	1	3	4	3	30	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-73 – Impact on Transformed habitat with PV facility and associated infrastructure.

Potential Impact: Loss of faunal SCC	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	3	27	Low	(-)
With Mitigation	2	1	3	2	2	16	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-74 – Impact on Transformed habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Loss of faunal SCC	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	5	55	Moderate	(-)
With Mitigation	2	1	3	4	3	30	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-75 – Impact on Freshwater ecosystems habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Loss of faunal SCC	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	3	3	4	40	Moderate	(-)
With Mitigation	3	1	3	2	3	27	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

9.4.3 OPERATIONAL PHASE

As a result of potential ineffective rehabilitation from the construction phase could present exposed and impacted areas leading to vegetation succession and a possible reduction of faunal diversity over the long-term. Poorly implemented and monitored AIP Management programme leading to the reintroduction and proliferation of AIP species within the proposed Tournée 2 Solar PV Facility. Potential poor management and failure to monitor rehabilitation efforts, leading to: Landscapes being left fragmented, resulting in reduced migration capabilities of faunal species, isolation of faunal populations and a decrease in faunal diversity; Increased storm water run-off; Compacted soils limiting the re-establishment of natural vegetation and Increased risk of erosion in areas left disturbed.

Table 9-76 – Impact on Grassland habitat with PV facility and associated infrastructure

Potential Impact: Increased risk of faunal collisions with vehicles; **• Altered species movement patterns and habitat utilisation in the local area;** **• Uncontrolled cutting of vegetation below the PV panels;** **• Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility;** **• Possible increased fire frequency during operational and maintenance activities; and** **• Proliferation of AIP species that colonise disturbed areas**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	4	2	3	4	4	**52**	**Moderate**	(-)
With Mitigation	2	2	3	4	3	**36**	**Moderate**	(-)
Mitigation and Management Measures	▪ All vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the development activities; ▪ No hunting/trapping or collecting of faunal species is allowed; ▪ Lights should face downwards to reduce the abundance of insects and any other fauna attracted to light. Invertebrates may attract bats to the project areas and may increase bat collisions or electrocutions. Furthermore, increased lighting will impose upon the nights darkness altering invertebrate movement. Lights should not be LED or white light; ▪ Ongoing alien and invasive plant monitoring and clearing/control should take place throughout the operational phase, and the project perimeters should be regularly checked for AIP establishment to prevent spread into surrounding natural areas which may alter the suitability of the habitat to faunal species; ▪ Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility, which comply with legal standards; ▪ No illicit fires must be allowed; ▪ Where bare soils are left exposed as a result of							

	construction activities, they should be immediately rehabilitated. Rehabilitated efforts should continue to be monitored throughout the operational phase, until natural processes will allow the ecological functioning and biodiversity of the area to be re-instated; ▪ Rehabilitation must proceed in accordance with the approved rehabilitation plan and must aim to achieve more than rehabilitation but must ensure that the veld is restored, at least, to a point where natural processes can re-instate the environment to a state that has the majority of the elements of biodiversity can be re-instated and supported; ▪ Preserve, enhance, restore or replace faunal movement corridors and habitat, important the freshwater ecosystem habitat; ▪ Edge effect control needs to be implemented to ensure no further degradation and potential loss of faunal SCC outside of the proposed project footprint area. An on-site Environmental Control Officer (ECO) should monitor and mitigate any edge effects throughout the life of the operation; ▪ No additional habitat is to be disturbed outside of the approved footprints areas. Bi-annual (minimum requirement) monitoring and recording of the footprint areas must be done during the operational and maintenance phase by the ECO and photographic records kept – special attention should also be paid to potential increase and spread of AIPs; ▪ Rehabilitation should only cease once a suitably qualified team of ecologists sign off that the rehabilitation and restoration is adequate; and ▪ It is recommended that vegetation regrowth during the Operational and Maintenance Phases must be promoted while appropriately maintained so as not to create a safety or production risk, as this will create habitat for faunal species and will aid in preventing soil erosion.

Table 9-77 – Impact on Grassland habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Increased risk of faunal collisions with vehicles; • Altered species movement patterns and habitat utilisation in the local area; • Uncontrolled cutting of vegetation below the PV panels; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during operational and maintenance activities; and • Proliferation of AIP species that colonise disturbed areas	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	4	4	**48**	**Moderate**	(-)
With Mitigation	2	2	3	4	2	**22**	**Low**	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-78 – Impact on Transformed habitat with PV facility and associated infrastructure

Potential Impact: Increased risk of faunal collisions with vehicles; • Altered species movement patterns and habitat utilisation in the local area; • Uncontrolled cutting of vegetation below the PV panels; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during operational and maintenance activities; and • Proliferation of AIP species that colonise disturbed areas	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	3	33	Moderate	(-)
With Mitigation	1	2	3	4	2	20	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-79 – Impact on Transformed habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Increased risk of faunal collisions with vehicles; • Altered species movement patterns and habitat utilisation in the local area; • Uncontrolled cutting of vegetation below the PV panels; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during operational and maintenance activities; and • Proliferation of AIP species that colonise disturbed areas	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	3	33	Moderate	(-)
With Mitigation	1	2	3	4	2	20	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-80 – Impact on Freshwater ecosystems habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Increased risk of faunal collisions with vehicles; • Altered species movement patterns and habitat utilisation in the local area; • Uncontrolled cutting of vegetation below the PV panels; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during operational and maintenance activities; and • Proliferation of AIP species that colonise disturbed areas	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	3	33	Moderate	(-)

With Mitigation	1	2	3	4	2	20	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-81 – Impact on Grassland habitat with PV facility and associated infrastructure

Potential Impact: Loss of faunal SCC **Increased risk of faunal collisions with vehicles;** **• Altered faunal SCC movement patterns and habitat utilisation in the local area;** **• Long term impacts to faunal SCC of the footprint area, including lost opportunity to re-establish a semblance of faunal SCC** **habitat and species activity in unison with the operation of the solar facility; and** **• Possible increased fire frequency during operational and maintenance activities; and** **• Proliferation of AIP species that colonise disturbed areas.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	2	3	4	3	33	Moderate	(-)
With Mitigation	1	2	3	4	2	20	Low	(-)
Mitigation and Management Measures	▪ Ongoing alien and invasive plant monitoring and clearing/control should take place throughout the operational and maintenance phase, and the project perimeters should be regularly checked for AIP establishment to prevent spread into surrounding natural areas which may alter the suitability of the habitat to faunal species; ▪ Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility, which comply with legal standards; ▪ All footprints should be rehabilitated as close to their pre-development conditions as possible, with indigenous vegetation re-instated to support faunal recolonisation of the area; ▪ No collection or hunting of any fauna species is to be allowed by personnel, especially with regards to faunal SCC (if encountered and not part of a rescue/relocation plan); ▪ Edge effect control needs to be implemented to prevent further degradation and potential loss of								

	faunal SCC habitat outside of the proposed development footprint; ▪ Where bare soils are left exposed as a result of construction activities, they should be immediately rehabilitated. Rehabilitated efforts should continue to be monitored throughout the operational phase, until natural processes will allow the ecological functioning and biodiversity of the area to be re-instated; ▪ Rehabilitation must proceed in accordance with the approved rehabilitation plan and must aim to achieve more than rehabilitation but must ensure that the veld is restored, at least, to a point where natural processes can re-instate the environment to a state that has the majority of the elements of biodiversity can be re-instated and supported; ▪ Rehabilitation efforts must be implemented for a period of at least five years after decommissioning and closure; ▪ it is recommended that vegetation regrowth during the Operational and Maintenance Phases must be promoted while appropriately maintained so as not to create a safety or production risk, as this will create habitat for faunal SCC and will aid in preventing soil erosion.

Table 9-82 – Impact on Grassland habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Loss of faunal SCC Increased risk of faunal collisions with vehicles; • Altered faunal SCC movement patterns and habitat utilisation in the local area; • Long term impacts to faunal SCC of the footprint area, including lost opportunity to re-establish a semblance of faunal SCC habitat and species activity in unison with the operation of the solar facility; and • Possible increased fire frequency during operational and maintenance activities; and • Proliferation of AIP species that colonise disturbed areas.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	3	4	3	30	Low	(-)
With Mitigation	1	1	3	4	2	18	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-83 – Impact on Freshwater ecosystems habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Loss of faunal SCC Increased risk of faunal collisions with vehicles; • Altered faunal SCC movement patterns and habitat utilisation in the local area; • Long term impacts to faunal SCC of the footprint area, including lost opportunity to re-establish a semblance of faunal SCC habitat and species activity in unison with the operation of the solar facility; and • Possible increased fire frequency during operational and maintenance activities; and • Proliferation of AIP species that colonise disturbed areas.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	3	5	1	24	Low	(-)
With Mitigation	1	1	3	4	2	18	Low	(-)

Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures

9.4.4 DECOMMISSIONING PHASE

The most significant impact will occur with rehabilitating disturbed areas and re-establishing the herbaceous layer as part of the ongoing rehabilitation activities for the proposed Tournée 2 Solar PV Facility. Potential ineffective rehabilitation of exposed and impacted areas leading to vegetation succession and a possible reduction of faunal species habitat over the long-term. Poorly implemented and monitored AIP Management programme leading to the reintroduction and proliferation of AIP species within the proposed Tournée 2 Solar PV Facility. Potential poor management and failure to monitor rehabilitation efforts, leading to Landscapes being left fragmented, resulting in reduced migration capabilities of faunal SCC species, isolation of faunal SCC populations; Increased storm water run-off; Compacted soils limiting the re-establishment of natural vegetation and Increased risk of erosion in areas left disturbed.

Table 9-84 – Impact on Grassland habitat with PV facility and associated infrastructure

Potential Impact: Increased risk of faunal collisions with vehicles; **• Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility;** **• Possible increased fire frequency during rehabilitation activities; and** **• Proliferation of AIP species that colonise disturbed areas.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	1	3	3	4	**40**	**Moderate**	(-)
With Mitigation	3	1	3	3	3	**30**	**Low**	(-)
Mitigation and Management Measures	▪ All infrastructure should be removed and the footprint areas rehabilitated in accordance with the rehabilitation and post-closure plan. Rehabilitation efforts must be continuously monitored for a period of at least 5 years after decommissioning and closure, or until an acceptable level of habitat and biodiversity re-instatement has occurred, in such a way as to ensure that natural processes and vegetative succession will lead to the re-establishment of the habitat conditions which are analogous with the desired post-closure land use; ▪ Edge effects and AIP proliferation, which may affect adjacent or sensitive habitat, need to be strictly							

	managed; ▪ Any natural areas beyond the direct authorised footprint, which have been affected by the decommissioning activities, must be rehabilitated using indigenous species; ▪ No hunting or trapping of faunal species to occur; ▪ Should any snakes be encountered during operations, a suitably qualified staff member or snake remover should be contacted to remove the snake, should it not move off by itself. No snakes or other faunal species are to be killed; ▪ No illicit fires by staff allowed; and ▪ Adequate post-closure safety precautions need to be taken to avoid failure of pillar structures potentially resulting in subsidence and/or collapse which will impact aboveground faunal habitat and species.

Table 9-85 – Impact on Grassland habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Increased risk of faunal collisions with vehicles; **• Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility;** **• Possible increased fire frequency during rehabilitation activities; and** **• Proliferation of AIP species that colonise disturbed areas.**	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	2	3	3	3	**33**	**Moderate**	(-)
With Mitigation	3	1	3	3	2	**20**	**Low**	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-86 – Impact on Transformed habitat with PV facility and associated infrastructure

Potential Impact: Increased risk of faunal collisions with vehicles; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during rehabilitation activities; and • Proliferation of AIP species that colonise disturbed areas.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	3	4	44	Moderate	(-)
With Mitigation	2	1	1	3	3	21	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-87 – Impact on Transformed habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Increased risk of faunal collisions with vehicles; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during rehabilitation activities; and • Proliferation of AIP species that colonise disturbed areas.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	1	3	3	24	Moderate	(-)
With Mitigation	2	2	3	3	3	30	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-88 – Impact on Grassland habitat with PV facility and associated infrastructure

Potential Impact: Increased risk of faunal collisions with vehicles; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during rehabilitation activities; and • Proliferation of AIP species that colonise disturbed areas.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	3	4	44	Moderate	(-)
With Mitigation	2	1	1	3	3	21	Low	(-)
Mitigation and Management Measures	▪ Ensure footprints remain as small as possible and that no footprint creep/edge effects occur; ▪ Ensure that no trapping and or hunting occur on site; ▪ Ensure no run-away fires occur that may further impact upon or degrade faunal habitat.							

Table 9-89 – Impact on Grassland habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Increased risk of faunal collisions with vehicles; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during rehabilitation activities; and • Proliferation of AIP species that colonise disturbed areas.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	3	3	33	Moderate	(-)
With Mitigation	2	1	3	3	2	18	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-90 – Impact on Transformed habitat with PV facility and associated infrastructure

Potential Impact: Increased risk of faunal collisions with vehicles; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during rehabilitation activities; and • Proliferation of AIP species that colonise disturbed areas.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	3	4	44	Moderate	(-)
With Mitigation	2	1	1	3	3	21	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

Table 9-91 – Impact on Transformed habitat with Linear development: Access roads; Internal roads and Interconnected OHPL.

Potential Impact: Increased risk of faunal collisions with vehicles; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during rehabilitation activities; and • Proliferation of AIP species that colonise disturbed areas.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	1	3	3	24	Moderate	(-)
With Mitigation	2	1	1	3	3	21	Low	(-)
Mitigation and Management Measures	▪ Refer to the table above for the associated mitigation measures							

9.5 AVIFAUNA IMPACT ASSESSMENT

9.5.1 CONSTRUCTION PHASE

Impacts to avifauna during the construction phase includes the following:

- Displacement of priority species due to disturbance associated with construction of Tournée SEF cluster and associated infrastructure (**Table 9-92**); and
- Displacement of priority species due to habitat transformation associated with construction of Tournée SEF Cluster and associated infrastructure (**Table 9-93**).

Table 9-92 – Impact of displacement of priority species during the construction phase

Potential Impact: Displacement of priority species Due to disturbance associated with construction	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	1	2	5	**45**	**Moderate**	(-)
With Mitigation	3	2	1	1	5	**34**	**Moderate**	(-)
Mitigation and Management Measures	▪ Construction activity should be restricted as far as possible to the immediate footprint of the required infrastructure. ▪ Access to the surrounding site outside of the footprint should be controlled and limited to reduce unnecessary disturbance to priority species. ▪ Best practice guidelines should be followed to control noise and dust. ▪ Existing roads should be used and construction of new roads kept to a minimum. ▪ Areas deemed most sensitive, should be avoided altogether to limit disturbance. ▪ Recommendations of the ecological specialist studies should be strictly followed.							

Table 9-93 – Impact of displacement of priority species during the construction phase

Potential Impact: Displacement of priority species Due to habitat transformation associated with construction	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	3	4	5	**65**	**High**	(-)
With Mitigation	3	2	3	4	4	**48**	**Moderate**	(-)
Mitigation and Management Measures	▪ A 100m solar panel free buffer zone should be implemented around dams, wetlands, and drainage lines. ▪ Sensitive grasslands and habitats where breeding and roosting occurs should be avoided.							

	■ Existing roads should be used and construction of new roads kept to a minimum. ■ Recommendations of the ecological specialist studies should be strictly followed.

9.5.2 OPERATIONAL PHASE

Impacts to Avifauna during the operational phase includes:

- Mortality of priority species due to collisions with solar panels (**Table 9-94**);
- Entrapment of large-bodied birds in the perimeter fence lines of Tournée SEF Cluster (**Table 9-95**);
- Mortality of priority species due to electrocution with reticulation networks (**Table 9-96**); and
- Mortality of priority species due to collisions with reticulation networks (**Table 9-97**).

Table 9-94 – Impact of the mortality of priority species due to collisions during the operational phase

Potential Impact: Mortality of priority species Due to collisions with solar panels	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	4	3	**27**	**Low**	(-)
With Mitigation	2	2	1	4	3	**27**	**Low**	(-)
Mitigation and Management Measures	■ Water dependant Priority Species were not prevalent on site in large numbers. These species are known to confuse PV solar panel arrays with waterbodies, but due to their low numbers the expected significance of this impact on the PAOI is low and no mitigation measures are currently recommended.							

Table 9-95 – Impact of the entrapment of large-bodied birds in the perimeter fence lines during the operational phase

Potential Impact: Entrapment of large-bodied birds In the perimeter fence lines	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	1	4	3	**30**	**Low**	(-)
With Mitigation	2	2	1	4	2	**18**	**Low**	(-)
Mitigation and Management Measures	■ A single perimeter fence is recommended to reduce							

	entrapment of priority species. ▪ Increasing the spacing between the two top wires (minimum of 30cm) and ensuring wires are barbless and correctly tensioned, will reduce snaring risk of birds (Especially the Marsh Owls present on site)

Table 9-96 – Impact of the mortality of priority species due to electrocution during the operational phase

Potential Impact: Mortality of priority species Due to electrocution with reticulation networks	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	1	4	3	**30**	**Low**	(-)
With Mitigation	2	2	1	4	1	**9**	**Very Low**	(-)
Mitigation and Management Measures	▪ Use underground cables as much as possible. ▪ Use raptor friendly pole designs, approved by an avifaunal specialist, and according to the Eskom designs provided.							

Table 9-97 – Impact the mortality of priority species due to collisions during the operational phase

Potential Impact: Mortality of priority species Due to collisions with reticulation networks	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	1	4	3	**30**	**Low**	(-)
With Mitigation	2	2	1	4	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ Use underground cables as much as possible. ▪ All overhead lines must be marked with Eskom approved flight diverters/flappers according to the latest official Eskom Engineering Instruction.							

9.5.3 DECOMMISSIONING PHASE

Impacts to Avifauna during the decommissioning phase includes:

- Displacement of priority species due to habitat transformation associated with construction of Tournée SEF Cluster and associated infrastructure (**Table 9-98**);

Table 9-98 – Impact of the displacement of priority species during the decommissioning phase

Potential Impact: Displacement of priority species Due to habitat transformation	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	1	2	5	**45**	**Moderate**	(-)
With Mitigation	3	2	1	2	5	**40**	**Moderate**	(-)
Mitigation and Management Measures	▪ Activity should be restricted as far as possible to the immediate footprint of the developed site. ▪ Access to the surrounding site outside of the footprint should be controlled and limited to reduce unnecessary disturbance to priority species. ▪ Decommissioning should take place outside of key breeding seasons for any priority species. ▪ Best practice guidelines should be followed to control noise and dust. ▪ Existing roads should be used and any construction of new roads kept to a minimum. ▪ Recommendations of the ecological specialist studies should be strictly followed.							

9.6 ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT

9.6.1 CONSTRUCTION PHASE

The heritage resources observed fall within the area proposed for the PV facilities based on the layout provided. WP 002 and 003 fall within the area proposed for the Tournée 2 PV Facility. As such, based on the current layouts provided, it is likely that all observed resources will be impacted by the proposed development.

Both WP 002 and WP 003 fall within the areas proposed for the Tournée 2 PV Facility. All the graves are highly significant, and a 50m buffer zone with a fence is recommended to ensure their conservation. Furthermore, it is recommended that a Heritage Management Plan be drafted for the ongoing management and conservation of the identified burials and other heritage resources.

Table 9-99 – Impact to archaeological resources during the construction phase

Potential Impact: Archaeological resources Damage to or destruction of sites	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	5	1	5	5	5	**80**	**High**	(-)

With Mitigation	1	1	5	5	1	**12**	**Very low**	(-)
Mitigation and Management Measures	- A no development buffer of 50m must be implemented around the burial sites identified within the development area. - Ongoing community access to these burials, as well as their conservation into the future, must be ensured. This can be managed through the development of a Heritage Management Plan for the burials to be implement for the duration of the project. - Should any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources be found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted. - If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit(Mimi Seetelo 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. - A professional archaeologist must be contracted as soon as possible to inspect the findings. - A Phase 2 rescue excavation operation may be required subject to permits issued by SAHRA.							

9.6.2 OPERATIONAL PHASE

There are no operational impacts anticipated for the cultural and heritage resources on site, however all prescribed mitigation measures should be implemented.

9.6.3 DECOMMISSIONING PHASE

The decommissioning impacts are expected to be the same as the construction phase, therefore the same mitigation measures should be implemented.

9.7 PALAEONTOLOGY IMPACT ASSESSMENT

According to the PIA completed for the project, based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct age and type to preserve fossils. The site visit and walk through confirmed that there were NO FOSSILS of any significance in the project footprint. Furthermore, the surface material to be excavated is soil and this does not preserve fossils. Since there is a small chance that fossils from the Vryheid Formation might occur below ground and might be disturbed when excavations commence for foundations and infrastructure, a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact to fossil heritage resources is low to moderate.

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and only some do contain fossil plant, insect, invertebrate and vertebrate material. The site visit and walk through on 06 February 2023 (summer) by palaeontologists confirmed that there are no fossils on the surface. There were no outcrops of shales that could potentially preserve fossils. There were no fossils on the surface. It is not known what lies below the surface but the soils appear to be a metre or more deep. The overlying soils and sands of the Quaternary period would not preserve fossils.

Based on the fossil record but confirmed by the site visit and walk through there are NO FOSSILS of any significance such as those of recognisable Glossopteris floral elements, even though fossils have been recorded from rocks of a similar age and type in South Africa. It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur below the ground surface in the shales of the Vryheid Formation so a Fossil Chance Find Protocol must be implemented for the duration of excavation activities.

9.7.1 CONSTRUCTION PHASE

Table 9-100 – Impact on fossil heritage resources during the construction phase

Potential Impact: Loss of fossil heritage resources	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	5	5	2	**26**	**Low**	(-)
With Mitigation	1	1	5	5	1	**12**	**Very low**	(-)
Mitigation and Management Measures	▪ The Chance Fossil Finds Procedure must be implemented for the duration of construction activities Section 8 of Palaeontological assessment (**Appendix H.8**)							

9.8 TRAFFIC ASSESSMENT

The potential impact on the surrounding environment is expected to be generated by the development traffic, of which traffic congestion and associated noise, dust, and exhaust pollution form part. It must be noted that the significance of the impact is expected to be higher during the construction and decommissioning phases because these phases generate the highest development traffic.

9.8.1 CONSTRUCTION PHASE

The construction phase will generate traffic including transportation of people, construction materials, water, and equipment (abnormal trucks transporting the transformers). The exact number of trips generated will be determined at a later stage. The impact of the temporary increase in traffic, noise and dust pollution associated with potential traffic is indicated in **Table 9-101**.

Table 9-101 – Impact of increased development trips during the construction phase

Potential Impact: Increase in Development Trips Increase in development trips for the duration of the construction phase; associated noise and dust pollution.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	4	1	2	4	**40**	**Moderate**	(-)
With Mitigation	2	4	1	2	3	**27**	**Low**	(-)
Mitigation and Management Measures	▪ Stagger components delivery to site. ▪ Reduce the construction period where possible. ▪ Stagger the construction phase. ▪ Use of mobile batch plants and quarries in close proximity to the site to decrease the impact on the surrounding road network. ▪ Staff and general trips should occur outside of peak traffic periods as much as possible. ▪ Maintenance of haulage routes. ▪ Design and maintenance of internal roads. Possibly provide two access points to the site to split construction vehicle trips and reduce the risk of congestion.							

9.8.2 OPERATIONAL PHASE

This phase includes the operation and maintenance of the Tournée 2 Solar PV Facility throughout its life span. Slight increase in trips due to transport of permanent staff to site, irregular maintenance and bi-annual transport of water for cleaning of panels. The traffic generated during this phase will have a nominal impact on the surrounding road network. The impact of noise and dust pollution associated with potential traffic is indicated on **Table 9-102**.

Table 9-102 – Impact of noise and dust pollution associated with potential traffic during the operational phase

Potential Impact: Noise and dust pollution Slight increase in trips due to transport of permanent staff to site, irregular maintenance and bi-annual transport of water for cleaning of panels	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	4	2	**18**	**Low**	(-)
With Mitigation	2	2	1	4	1	**9**	**Very Low**	(-)

Mitigation and Management Measures	▪ Source on-site water if possible. ▪ Utilise cleaning systems for the panels needing less vehicle trips. ▪ Schedule trips for the provision of water for the cleaning of panels outside peak traffic times as much as possible.

9.8.3 DECOMMISSIONING PHASE

This phase will have similar impacts and generated trips as the Construction Phase. The impact of the temporary increase in traffic, noise and dust pollution associated with potential traffic is indicated in **Table 9-103**.

Table 9-103 – Impact of increased development trips during the decommissioning phase

Potential Impact: Increase in Development Trips Increase in development trips for the duration of the construction phase; associated noise and dust pollution.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	4	1	2	4	**40**	**Moderate**	(-)
With Mitigation	2	4	1	2	3	**27**	**Low**	(-)
Mitigation and Management Measures	▪ Stagger components delivery to site. ▪ Reduce the decommissioning period where possible. ▪ Stagger the decommissioning phase. ▪ Use of mobile batch plants and quarries in close proximity to the site to decrease the impact on the surrounding road network. ▪ Staff and general trips should occur outside of peak traffic periods as much as possible. ▪ Maintenance of haulage routes. ▪ Design and maintenance of internal roads. Possibly provide two access points to the site to split construction vehicle trips and reduce the risk of congestion.							

9.9 VISUAL IMPACT ASSESSMENT

Most of the time farmsteads have trees surrounding or partially surrounding the houses to act as windbreaks, which is also beneficial from a visual impact perspective in so that it assists in screening (or partial) the proposed infrastructure. As such the impacts below are grouped in the following manner: the farmsteads within 2 km radius, the gravel road traversing the Tournée 2 Solar PV Park and the Tutuka Power Station Airfield.

9.9.1 CONSTRUCTION PHASE

Table 9-104 – Impact on Farmsteads within 2km radius during construction

Potential Impact: Removal of vegetation leading to potential visual contrast, loss of visual intrusion on sensitive receptors. **Alteration of natural features, resulting in potential loss or alterations of natural vegetation (grassland), leading to loss of visual quality and visual exposure.**	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	3	2	5	**55**	**Moderate**	(-)
With Mitigation	3	2	3	2	5	**50**	**Moderate**	(-)
Mitigation and Management Measures	▪ All construction areas must be kept in a neat and orderly condition at all times; ▪ The development footprint and disturbed areas associated with the construction phase of the project should be kept as small as possible, with as little indigenous vegetation being cleared as possible; ▪ Construction boundaries should be clearly demarcated to minimise areas of surface disturbance; ▪ Site offices and temporary structures should be limited to single storey and situated at such a location so as to reduce visual intrusion; ▪ Any areas for temporary material storage and other potentially intrusive activities must be screened from view as far as possible, i.e. not situated in a direct line of sight from a receptor (farmsteads); ▪ An efficient removal system of waste and rubble must be ensured during the construction phase; ▪ The duration of the construction phase should be reduced as far as possible through careful planning, to reduce the exposure of bare ground and thus potential of dust generation especially on windy days; ▪ The height of any temporary structures such as soil stockpiles should be kept as low as possible; ▪ Excavation and earthmoving activities are to be kept to a minimum and limited to foundation areas for substations and support structures of the PV panels; ▪ During the construction phase all dirt and access roads, as well as other areas cleared of vegetation for construction purposes will require effective dust suppression such as regular watering; ▪ Direct loss of or damage to valuable natural visual resources such as the freshwater ecosystems in the area should be actively avoided;								

	- As far as possible, existing roads are to be utilised for construction and maintenance purpose, to limit cumulative impacts from roads, as well as to limit the extent of the vegetation cleared for the purpose of the project; - Internal access roads must be suitably maintained to limit erosion and dust pollution. To reduce the dust accumulation on the solar PV panels, and hence the more regular cleaning thereof, it is recommended that the internal roads be surfaced; - Vehicle speed on unpaved roads must be reduced to limit dust creation. The following speed is recommended: 40km/h for normal vehicles and 30km/h for heavy vehicles; - Concurrent/ progressive rehabilitation of temporary cleared areas, including reshaping and revegetation, must be implemented as soon as possible; - Upon completion of construction, the project area should be left in a condition that protects the soil surface against erosion and instability; - Indigenous and locally occurring plant species selected for use in re-vegetation should be selected taking quick growth rates into consideration in order to cover bare areas and prevent soil erosion; and - Upon decommissioning, it is important that vegetation be reinstated to blend with the natural environment.

Table 9-105 – Impact on the Gravel road during construction

Potential Impact: Removal of vegetation leading to potential visual contrast, loss of visual intrusion on sensitive receptors. **Alteration of natural features, resulting in potential loss or alterations of natural vegetation (grassland), leading to loss of visual quality and visual exposure.**	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	3	3	2	5	**55**	**Moderate**	(-)
With Mitigation	3	2	3	2	5	**50**	**Moderate**	(-)

Mitigation and Management Measures	▪ Please refer to the mitigation measures described in the Table above. Additional mitigatory measures applicable to the gravel road are listed below: ▪ It is further recommended that a row of trees be planted on both sides of the gravel road, for the length of the Facility, to assist in screening, at least to a degree, the proposed Facility.

Table 9-106 – Impact on receptors within 5km during construction

Potential Impact: Night time security lighting at the temporary construction camps, office area, workshop/store and plant area impacting the sensitive receptors in the area;	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	3	1	2	4	**36**	**Moderate**	(-)
With Mitigation	3	3	1	2	4	**36**	**Moderate**	(-)
Mitigation and Management Measures	▪ As far as possible, construction activities should be restricted to daylight hours, in order to limit the need of bright floodlighting and the potential for skyglow and to avoid the use of additional night-time lighting for security purposes; ▪ Night lighting of construction sites and camps, the BESS, substation and O&M Building should be minimised as far as possible, taking into consideration that due to safety requirements a certain level of lighting may be necessary; ▪ Where security lighting is used during the construction phase, the following management measures should be implemented: ▪ Making use of motion detectors on security lighting, at the substation, BESS and O&M Building, ensures that the site will remain in relative darkness, until lighting is required for security and maintenance purposes; ▪ Placement of lights should consider the location of surrounding receptors and as far as possible be screened from view; ▪ The use of high light masts and high pole top security lighting should be avoided; ▪ Up-lighting of structures must be avoided, with lighting installed at downward angles that provide precisely directed illumination beyond the immediate surroundings of the infrastructure, thereby minimising the light spill and trespass;								

	▪ Care should be taken when selecting luminaries to ensure that appropriate units are chosen and that their location will reduce spill light and glare to a minimum; ▪ Minimum wattage light fixtures should be used, with the minimum intensity necessary to accomplish the light's purpose; ▪ The use of low-pressure sodium lamps, yellow LED lighting, or an equivalent should be considered to reduce skyglow (BLM, 2013).

9.9.2 OPERATIONAL PHASE

Table 9-107 – Impact on Farmsteads within 2km during operational phase

Potential Impact: Operation of PVSEF and increased vehicular and human movement.	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	2	3	4	5	**60**	**Moderate**	(-)
With Mitigation	3	2	3	3	5	**55**	**Moderate**	(-)
Mitigation and Management Measures	▪ Appropriately selected and installed fencing should be muted in colour and located as close as possible around the Facility, to avoid impeding visibility and ensure that it is visually pleasing to observers. ▪ The use of highly reflective material for storage, BESS and security facilities should be avoided. Lighter tones attract an observer while darker shades recede from the viewer, therefore pure whites and bright colours should be avoided, unless such colours are present in the landscape. ▪ It must be ensured that all buildings / containers and other structures fit its surroundings through the appropriate use of colour and material selection in order to lower the visibility of the proposed infrastructure. It is recommended that neutral colours be utilised, where possible. ▪ The use of permanent signage and project construction signs should be minimised and visually unobtrusive. ▪ Erosion, which may lead to high levels of visual contrast and further detract from the visual environment, must be prevented throughout the lifetime of the project by means of putting soil stabilisation measures in place where required and through concurrent rehabilitation. ▪ Indigenous and locally occurring plant species selected for use in re-vegetation should be selected taking quick growth rates into consideration in order to cover bare								

	areas and prevent soil erosion

Table 9-108 – Impact on the Gravel road during operation

Potential Impact: Operation of the PVSEF in an area where no previous renewable energy facilities are present.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	4	5	60	Moderate	(-)
With Mitigation	3	2	3	3	5	55	Moderate	(-)
Mitigation and Management Measures	▪ Please refer to the mitigation measures described in the Table above. Additional mitigatory measures applicable to the gravel road are listed below: ▪ Recent studies indicated that an extra layer of anti-reflective material on the outer surface of the glass can further limit sunlight reflection (Sreenath et. al., 2019). This should be helpful to reduce the potential glint and glare experienced especially where the gravel road is slightly elevated above the Facility and should be investigated if practical and feasible. ▪ Another design feature to limit glint and glare is to roughen the protective glass surface, reducing specular reflection (Sreenath et. al., 2019). ▪ A possible mitigatory technique that can be employed is possible adjustment in the tilt and orientation angle of PV modules. These changes can alter the direction of solar reflection and hence the degree of glare impact. The Solar Glare Hazard Analysis Tool (SGHAT) can be used to check the glare potential for the proposed PV system design values. SGHAT has the capability to identify PV configurations that produce no glare and the design with maximum energy production can be selected (Sreenath et. al., 2019). This should be investigated if practical and feasible. ▪ It is further recommended that a row of trees be planted on both sides of the gravel road, for the length of the Facility, to assist in screening, at least to a degree, the proposed Facility. This should be investigated if practical and feasible.								

The airstrip of the Tutuka Power Station axis is orientated at a north north-east to south south-west direction, which puts the airstrip at a significantly lower risk to glint and glare impacts when landing and on take-off from features in the landscape. The Tournée 2 Solar PV Facility is located at an angle between 60˚ and 65˚ to the runway axis, depending on the position within the Tournée 2 Solar PV Park. From the above, the risk of glint and glare on the Tutuka Power Station Airfield – FATT is reduced considerably. With the Airfield located approximately 6,3 km west of the Tournée 2 Solar PV Park, the potential visual impacts experienced during the construction and decommissioning phases of the project are considered negligible for the Airfield, since potential glint and glare will not be experienced during these phases,

Table 9-109 – Impact on Tutuka Power Station Airfield during operation

Potential Impact: Potential glint and glare experienced	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	3	3	3	2	20	Low	(-)
With Mitigation	1	2	1	3	2	14	Low	(-)
Mitigation and Management Measures	▪ A mitigatory measure that could be implemented is that the PV Panels are no longer managed as flat by the time the sun rises, and should ideally be facing east already, to lower the risk of reflection toward the airstrip. ▪ Recent studies indicated that an extra layer of anti-reflective material on the outer surface of the glass can further limit sunlight reflection (Sreenath et. al., 2019). This should be helpful to reduce the potential glint and glare experienced especially where the gravel road is slightly elevated above the Facility and should be investigated if practical and feasible. ▪ Another design feature to limit glint and glare is to roughen the protective glass surface, reducing specular reflection (Sreenath et. al., 2019). This should be investigated if practical and feasible. ▪ A possible mitigatory technique that can be employed is possible adjustment in the tilt and orientation angle of PV modules. These changes can alter the direction of solar reflection and hence the degree of glare impact. The Solar Glare Hazard Analysis Tool (SGHAT) can be used to check the glare potential for the proposed PV system design values. SGHAT has the capability to identify PV configurations that produce no glare and the design with maximum energy production can be selected (Sreenath et. al., 2019). This should be investigated if practical and feasible.								

Table 9-110 – Impact on receptors within 5km during operation

Potential Impact: Night-time security lighting at the BESS, O&M Buildings and substation;	Magnitude	Extent	Reversibility	Duration	Probability	Significance	Character

Without Mitigation	3	3	1	2	4	**30**	**Low**	(-)
With Mitigation	3	3	1	3	4	**24**	**Low**	(-)
Mitigation and Management Measures	▪ Night lighting of construction sites and camps, the BESS, substation and O&M Building should be minimised as far as possible, taking into consideration that due to safety requirements a certain level of lighting may be necessary; ▪ It must be ensured that routine maintenance and cleaning of PV modules, especially after a rainfall event, should occur during the daylight hours, to reduce the potential of night lighting and potential temporary contribution to skyglow; ▪ Where security lighting is used during the operational phase, the following management measures should be implemented: ▪ Making use of motion detectors on security lighting, at the substation, BESS and O&M Building, ensures that the site will remain in relative darkness, until lighting is required for security and maintenance purposes; ▪ Placement of lights should consider the location of surrounding receptors and as far as possible be screened from view; ▪ The use of high light masts and high pole top security lighting should be avoided; ▪ Up-lighting of structures must be avoided, with lighting installed at downward angles that provide precisely directed illumination beyond the immediate surroundings of the infrastructure, thereby minimising the light spill and trespass; ▪ Care should be taken when selecting luminaries to ensure that appropriate units are chosen and that their location will reduce spill light and glare to a minimum; ▪ Minimum wattage light fixtures should be used, with the minimum intensity necessary to accomplish the light's purpose; ▪ The use of low-pressure sodium lamps, yellow LED lighting, or an equivalent should be considered to reduce skyglow (BLM, 2013). ▪ Upon decommissioning, it is recommended that no activities occur at night, to reduce the use of bright floodlighting.							

9.9.3 DECOMISSIONING PHASE

Table 9-111 – Impact on farmsteads within 2km during decommissioning

Potential Impact: Demolition and removal of infrastructure leading to dust generation, erosion and changes in the visual character of the project area.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	2	4	**40**	**Moderate**	(-)
With Mitigation	3	1	3	2	4	**36**	**Moderate**	(-)
Mitigation and Management Measures	▪ Mitigation measures from the construction phase should also be applied during the decommissioning phase. ▪ Upon decommissioning, it is important that vegetation be reinstated to blend with the natural environment. ▪ Concurrent/ progressive rehabilitation of temporary cleared areas, including reshaping and revegetation, must be implemented as soon as possible.							

Table 9-112 – Impact on the gravel road during decommissioning

Potential Impact:	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	2	4	**40**	**Moderate**	(-)

With Mitigation	3	1	3	3	4	**36**	**Moderate**	(-)
Mitigation and Management Measures	▪ Mitigation measures from the construction phase should also be applied during the decommissioning phase. ▪ Upon decommissioning, it is important that vegetation be reinstated to blend with the natural environment. ▪ Concurrent/ progressive rehabilitation of temporary cleared areas, including reshaping and revegetation, must be implemented as soon as possible.							

Table 9-113 – Impact on receptors within 5km during decommissioning

Potential Impact: Additional lighting that may be required during decommissioning phase.	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	2	1	2	3	**21**	**Low**	(-)
With Mitigation	2	1	1	2	3	**18**	**Low**	(-)
Mitigation and Management Measures	▪ Upon decommissioning, it is recommended that no activities occur at night, to reduce the use of bright floodlighting.							

9.10 SOCIAL IMPACT ASSESSMENT

9.10.1 CONSTRUCTION PHASE

Creation of local employment, training, and business opportunities

The construction phase of the PV SEF will extend over a period of approximately 18-24 months and create in the region of 150 employment opportunities. Members from the local communities in the area, specifically Standerton, Thuthukani, Morgenson, Bethal and Secunda would be in a position to qualify for a percentage of the low skilled and semi-skilled employment opportunities. Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members of the community. Based on information from similar projects the total wage bill will be in the region of R 30 million (2023 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the local towns in the area.

Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a localised, social benefit. The capital expenditure associated with the construction phase will be approximately R 2 billion (2023 Rand value). Due the lack of diversification in the local economy the potential for local companies is likely to be limited. The majority of benefits are therefore likely to accrue to contractors and engineering companies based outside the LM. The local service sector will also benefit from the construction phase. The potential opportunities would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site. Construction workers are likely to be accommodated in Standerton.

The hospitality industry in the area will also benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other construction projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project.

The impact assessment of employment and business creation opportunities during the construction phase is indicated in **Table 9-114**.

Table 9-114 – Impact assessment of employment and business creation opportunities during the construction phase during the construction phase

Potential Impact: Creation of employment and business opportunities	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	N/A	2	3	21	Low	(+)
With Mitigation	3	3	N/A	2	4	32	Moderate	(+)
Enhancement	**Employment:** ▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase. ▪ Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area. ▪ Where feasible, efforts should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria. ▪ Before the construction phase commences the proponent should meet with representatives from the LM to establish the existence of a skills database for the area. If such as database exists, it should be made available to the contractors appointed for the construction phase. ▪ The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.							

	- Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase. - The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. **Business:** - The proponent should liaise with the LM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction service providers. These companies should be notified of the tender process and invited to bid for project-related work. *Note that while preference to local employees and companies is recommended, it is recognised that a competitive tender process may not guarantee the employment of local labour for the construction phase.*

Impact of construction workers on local communities

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

- An increase in alcohol and drug use.
- An increase in crime levels.
- The loss of girlfriends and/or wives to construction workers.
- An increase in teenage and unwanted pregnancies.
- An increase in prostitution.
- An increase in sexually transmitted diseases (STDs), including HIV.

The objective will be to source as many of the low and semi-skilled workers locally (Standerton, Thuthukani, Morgenson, Bethal and Secunda). These workers will be from the local community and form part of the local family and social networks. This will reduce the risk and mitigate the potential impacts on the local community. The potential impact on the local community is therefore likely to be low. The balance of semi-skilled and skilled workers is likely to be accommodated in Standerton.

The assessment of impact of the presence of construction workers in the area on local communities is indicated in **Table 9-115**.

Table 9-115 – Assessment of impact of the presence of construction workers in the area on local communities during the construction phase

Potential Impact: Presence of construction workers in the area on local communities	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	3	27	Moderate	(-)
With Mitigation	2	1	3	2	3	24	Low	(-)
Mitigation and Management Measures	▪ Preparation and implementation of a SEP prior to and during the construction phase. ▪ Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase. ▪ The SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to report resolve incidents. ▪ Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories. ▪ The proponent should consider the option of establishing a Monitoring Committee (MC) for the construction phase that representatives from local landowners, farming associations, and the local municipality. This MC should be established prior to commencement of the construction phase and form part of the SEP. ▪ The proponent and contractor should develop a Code of Conduct (CoC) for construction workers. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be subject to appropriate disciplinary action and/or dismissed. All dismissals must comply with the South African labour legislation. The CoC should be signed by the proponent and the contractors before the contractors move onto site. The CoC should form part of the CHSSP. ▪ The proponent and the contractor should implement an HIV/AIDS, COVID-19 and Tuberculosis (TB) awareness programme for all construction workers at the outset of the construction phase. The programmes should form part of the CHSSP. ▪ The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contactor to effectively manage and monitor the movement of construction workers on and off the site. ▪ The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days for their contract coming to an end. ▪ No construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.								

Influx of job seekers

Large construction projects tend to attract people to the area in the hope that they will secure a job, even if it is a temporary job. These job seekers can in turn become "economically stranded" in the area or decide to stay on irrespective of finding a job or not. While the proposed project on its own does not constitute a large construction project, the establishment of a number of renewable energy projects in the area may attract job seekers to the area. As in the case of construction workers employed on the project, the actual presence of job seekers in the area does not in itself constitute a social impact. However, the way in which they conduct themselves can impact on the local community. The main areas of concern associated with the influx of job seekers include:

- Impacts on existing social networks and community structures.
- Competition for housing, specifically low-cost housing.
- Competition for scarce jobs.
- Increase in incidences of crime.

These issues are similar to the concerns associated with the presence of construction workers. Based on experience from the construction of other renewable energy facilities the potential for economically motivated in-migration and subsequent labour stranding is likely to limited. This is due to the relatively limited number of employment opportunities and short duration of the construction phase. In addition, the economic opportunities in Standerton are limited.

The assessment of impact of job seekers on local communities is indicated in **Table 9-116**.

Table 9-116 – Impact assessment of impact of job seekers on local communities during the construction phase

Potential Impact: Influx of job seekers impacts on family structures, social networks and community services associated with the influx of job seekers	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	3	**27**	**Low**	(-)
With Mitigation	2	1	3	2	3	**24**	**Low**	(-)
Mitigation and Management Measures	▪ Preparation and implementation of a SEP prior to and during the construction phase. ▪ Preparation and implementation of CHSSP prior to and during the construction phase. ▪ The proponent, in consultation with the LM, should investigate the option of establishing a MC to monitor and identify potential problems that may arise due to the influx of job seekers to the area. The MC should also include the other proponents of solar energy projects in the area. ▪ The proponent should implement a "locals first" policy, specifically with regard to unskilled and low skilled opportunities. ▪ The proponent should implement a policy that no employment will be available at the gate.							

Risk to safety, livestock, and farm infrastructure

The presence on and movement of construction workers on and off the site poses a potential safety threat to local famers and farm workers in the vicinity of the site. In addition, farm infrastructure, such as fences and gates, may be damaged and stock losses may also result from gates being left open and/or fences being damaged, or stock theft linked either directly or indirectly to the presence of construction workers on the site. The potential risks (safety, livestock, and farm infrastructure) can be effectively mitigated by careful planning and managing the movement of construction workers and construction related activities during the construction phase.

The Tournée 2 PV SEF is located on Remaining Portion of Portion 3 of the Farm Dwars-In-D-Weg 350, owned by Eskom. Eskom have entered into lease agreements that enable local farmers to use the land. It is understood that the lease agreements will not be extended to enable the development of the PV SEF. The establishment of the PV SEF will therefore have a limited impact on farming operations. However, the construction activities may impact on adjacent landowners. These impacts can be effectively mitigated.

The assessment of risk to safety, livestock, and damage to farm infrastructure is indicated in **Table 9-117**.

Table 9-117 – Impact assessment of risk to safety, livestock, and damage to farm infrastructure during the construction phase

Potential Impact: Risk to safety, livestock, and damage to farm infrastructure	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	3	24	Low	(-)
With Mitigation	2	1	3	2	3	24	Low	(-)
Mitigation and Management Measures	▪ Preparation and implementation of a SEP prior to and during the construction phase. ▪ Preparation and implementation of a CHSSP prior to and during the construction phase. ▪ The proponent should enter into an agreement with adjacent local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences. ▪ All farm gates must be closed after passing through. ▪ Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers to and from the site. ▪ The proponent should establish a MC and CoC for workers (see above). ▪ The proponent should hold contractors liable for compensating farmers and in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent,							

	the contractors, and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below). ▪ The proponent should implement a Grievance Mechanism that provides local farmers with an effective and efficient mechanism to address issues related to report issues related to damage to farm infrastructure, stock theft and poaching etc. ▪ The Environmental Management Plan (EMP) must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested. ▪ Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms. ▪ Contractors appointed by the proponent must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the CoC. All dismissals must be in accordance with South African labour legislation. ▪ It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

Increased risk of grass fires

The presence of construction workers and construction-related activities on the site may pose an increased risk of grass fires that could, in turn pose, a threat to livestock, crops, and farm infrastructure both on the site and for adjacent landowners. The potential risk of grass fires will be higher during the dry, windy winter months from May to October. The impacts are likely to be largely local and can be effectively mitigated.

The assessment of impact of increased risk of grass fires is indicated in **Table 9-118**.

Table 9-118 – Impact assessment of impact of increased risk of grass fires during the construction phase

Potential Impact: Increased risk of grass fires	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	2	3	30	Moderate	(-)
With Mitigation	2	1	3	2	2	12	Very Low	(-)
Mitigation and Management Measures	▪ Preparation and implementation of a SEP prior to and during the construction phase. ▪ Preparation and implementation of a CHSSP prior to and during the construction phase.							

	▪ The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences. ▪ Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas. ▪ Smoking on site should be confined to designated areas. ▪ Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high-risk dry, windy winter months. ▪ Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle. ▪ Contractor should provide fire-fighting training to selected construction staff. As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities. ▪ No construction staff, with the exception of security staff, to be accommodated on site overnight.

Nuisance impacts associated with construction related activities

Construction related activities, including the movement of heavy construction vehicles of and on the site, has the potential to create dust, noise and safety impacts and damage to local roads. The impacts are likely to be largely local and can be effectively mitigated.

The assessment of the impacts associated with construction related activities is indicated in **Table 9-119**.

Table 9-119 – Impact assessment of the impacts associated with construction related activities during the construction phase

Potential Impact: Construction related activities	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	2	3	30	Moderate	(-)
With Mitigation	2	1	3	2	2	16	Low	(-)
Mitigation and Management Measures	▪ Preparation and implementation of a SEP prior to and during the construction phase. ▪ Preparation and implementation of a CHSSP prior to and							

	during the construction phase. ▪ Timing of construction activities should be planned to avoid / minimise impact on key farming activities, including planting and harvesting operations. ▪ The proponent should establish a MC to monitor the construction phase and the implementation of the recommended mitigation measures. The MC should be established before the construction phase commences, and should include key stakeholders, including representatives from local farmers and the contractor(s). The MF should also address issues associated with damage to roads and other construction related impacts. ▪ Ongoing communication with landowners and road users during construction period. This should be outlined in the SEP. ▪ The proponent should implement a Grievance Mechanism that provides local farmers and other road users with an effective and efficient mechanism to address issues related to construction related impacts, including damage to local gravel farm roads. ▪ Implementation of a road maintenance programme throughout the construction phase to ensure that the affected roads maintained in a good condition and repaired once the construction phase is completed. ▪ Repair of all affected road portions at the end of construction period where required. ▪ Dust suppression measures must be implemented on un-surfaced roads, such as wetting on a regular basis and ensuring that vehicles used to transport building materials are fitted with tarpaulins or covers. ▪ All vehicles must be roadworthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.

Impacts associated with loss of farmland

The activities associated with the construction phase and establishment of the proposed project and associated infrastructure will result in the disturbance and loss of land available for grazing and crops. The impact on farmland associated with the construction phase can be mitigated by minimising the footprint of the construction related activities and ensuring that disturbed areas are fully rehabilitated on completion of the construction phase. In addition, the landowner will be compensated for the loss of land. As indicated above, The Tournée 2 PV SEF is located on Remaining Portion of Portion 3 of the Farm Dwars-In-D-Weg 350, owned by Eskom. Eskom have entered into lease agreements that enable local farmers to use the land. It is understood that the lease agreements will not be extended to enable the development of the PV SEF.

The lessee of Portion 3 of Dwars in De Weg (Tournée 2 PV SEF) indicated that the property leased from Eskom is used to produce summer crops, including maize and soybean. In addition, areas are used for grazing and are cut annually and used as fodder for cattle. Approximately 140ha are planted with maize with an average production of 6t/ha maize. The total potential yield is therefore ~ 840 tons which generates an annual income of ~ R3 million. The value of the fodder produced from 10ha of land is in the region of R180 000. The lessee indicated that the land leased from Eskom

(~273ha) forms a integral part of the farming business and alternative plans will need to be put in place to and if we end up losing it, we would definitely need to make alternative plans in order to reduce the impact of the potential loss of income.

The lessee of Portion Portion 3 of Dwars in De Weg (Tournée 2 PV SEF) indicated that they have a 5-year lease with Eskom. They currently give Eskom a courtesy call before they start preparing for the next season. The lessee also indicated that land in the area was scarce, and Eskom is currently the only landowner in the area that provides the opportunity to lease land. The opportunities to lease land are therefore limited.

Although the land is leased from Eskom the loss of land will impact on the farmers that currently lease land from Eskom.

The assessment of impact on farmland due to construction related activities is indicated in **Table 9-120**.

Table 9-120 – Impact assessment of impact on farmland due to construction related activities during the construction phase

Potential Impact: Loss of farmland	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	3	2	4	36	Moderate	(-)
With Mitigation	1	1	3	2	4	28	Low	(-)
Mitigation and Management Measures	▪ Eskom should assess if replacement land is available in the area that can be leased to the current lessees. ▪ The recommendations of the agricultural / soil assessment should be implemented. ▪ The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be minimised. ▪ An Environmental Onsite Compliance Officer (ESCO) and Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase. ▪ All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase. ▪ The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation programme should be drawn up by the Environmental Consultants appointed to manage the EIA. ▪ The implementation of the Rehabilitation Programme should be monitored by the ECO.								

9.10.2 OPERATIONAL PHASE

Improve energy security and develop the renewable energy sector

The primary goal of the proposed project is to improve energy security in South Africa by generating additional energy. The proposed SEF also reduces the carbon footprint associated with energy generation. The project should therefore be viewed within the context of the South Africa's current reliance on coal powered energy to meet most of its current energy needs. The project will be bid in the REIPPPP and consider private energy agreements. The development should also be considered within the context of the REIPPPP.

Improved energy security

South Africa's energy crisis, which started in 2007 and is ongoing, has resulted in widespread rolling blackouts (referred to as load shedding) due to supply shortfalls. The load shedding has had a significant impact on all sectors of the economy and on investor confidence. The mining and manufacturing sector have been severely impacted and will continue to be impacted until such time as there is a reliable supply to energy. The Minister of Mineral Resources and Energy, Gwede Mantashe, indicated in February 2023 that the cost of load shedding was estimated at R1 billion a day . The South African Reserve Bank indicated in February 2023 that stage 3 and stage 6 loadshedding cost the South African economy between R204 million and R899 million a day.

A survey of 3 984 small business owners in 2019 found that 44% said that they had been severely affected by load shedding with 85% stating that it had reduced their revenue, with 40% of small businesses losing 20% or more or revenue during due to load shedding period .

Impact of a coal powered economy

The Green Jobs study (2011) notes that South Africa has one of the most carbon-intensive economies in the world, thus making the greening of the electricity mix a national imperative. The study notes that renewable energy provides an ideal means for reaching emission reduction targets in a relatively easy manner. In addition, and of specific relevance to South Africa renewable energy is not as dependent on water compared to the massive water requirements of conventional power stations, has a limited footprint and therefore does not impact on large tracts of land, poses limited pollution and health risks, specifically when compared to coal and nuclear energy plants.

The Greenpeace Report (powering the future: Renewable Energy Roll-out in South Africa, 2013), also notes that within a broader context of climate change, coal energy does not only have environmental impacts, it also has socio-economic impacts. These include acid mine drainage from abandoned mines in South Africa and the risk this poses on the country's limited water resources.

Benefits associated with REIPPPP

Through the competitive bidding process, the IPPPP has effectively leveraged rapid, global technology developments and price trends, buying clean energy at lower and lower rates with every bid cycle, resulting in SA getting the benefit of renewable energy at some of the lowest tariffs in the world. The price for wind power has dropped by 50% to R0.94/kWh, while solar PV has dropped with 75% to R1.14/kWh between BW1 and BW4.

Prices contracted under the REIPPPP for all technologies are well below the published REFIT prices. The REIPPPP has effectively translated policy and planning into delivery of clean energy at very competitive prices. As such it is contributing to the national aspirations of secure, affordable energy, lower carbon intensity and a transformed 'green' economy.

The impact of approving improve energy security and support renewable sector is indicated in **Table 9-121**.

Table 9-121 – Impact of approving improve energy security and support renewable sector during the operational phase

Potential Impact: Improving energy security and support renewable sector	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	4	N/A	4	4	48	Moderate	(+)
With Mitigation	4	4	N/A	4	5	60	High	(+)
Enhancement	▪ Maximise the number of employment opportunities for local community members. ▪ Implement training and skills development programs for members from the local community. ▪ Maximise opportunities for local content and procurement.							

Creation of employment opportunities

The proposed development will create approximately 30 full time employment opportunities during the operational phase. Based on similar projects the annual operating budget will be in the region of R 25 million (2023 Rand values), including wages.

The impact assessment of employment and business creation opportunities is indicated in **Table 9-122**.

Table 9-122 – Impact assessment of employment and business creation opportunities during the operational phase

Potential Impact: Creation of employment opportunities	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	N/A	4	2	14	Very Low	(+)
With Mitigation	3	2	N/A	4	4	36	Moderate	(+)
Enhancement	**Employment:** ▪ Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories.							

	- Where feasible, efforts should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria. - Before the operational phase commences the proponent should meet with representatives from the HM to establish the existence of a skills database for the area. - The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the operational phase of the project. - Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the operational phase. - The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. **Business:** - The proponent should liaise with the LM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers prior to the commencement of the operational. These companies should be notified of the tender process and invited to bid for project-related work. - Where possible, the proponent should assist local BBBEE companies to complete and submit the required tender forms and associated information.

Benefits associated with the socio-economic development contributions

The REIPPPP has been designed not only to procure energy but has also been structured to contribute to the broader national development objectives of job creation, social upliftment and broadening of economic ownership. Socio-economic development (SED) contributions are an important focus of the REIPPPP and are aimed at ensuring that local communities benefit directly from the investments attracted into the area. These contributions are linked to Community Trusts and accrue over the project operation life and, in so doing, create an opportunity to generate a steady revenue stream over an extended period. This revenue can be used to fund development initiatives in the area and support the local community. The long-term duration of the revenue stream also allows local municipalities and communities to undertake long term planning for the area. The revenue from the proposed SEF can be used to support a number of social and economic initiatives in the area, including:

- Creation of jobs.
- Education.
- Support for and provision of basic services.
- School feeding schemes.
- Training and skills development.
- Support for SMME's.

The minimum compliance threshold for SED contributions is 1% of the revenue with 1.5% the targeted level over the 20-year project operational life. For the current portfolio of projects, the average commitment level is 2%, which is 101% higher than the minimum threshold level. To date (across BW1-4) a total contribution of R22.8 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R1.1 billion. Of the total commitment, R18.5 billion is specifically allocated for local communities where the IPPs operate. With every new IPP on the grid, revenues and the respective SED contributions will increase.

As a percentage of revenue, SED obligations become effective only when operations commence, and revenue is generated. Of the 91 IPPs that have reached financial close (BW1–BW4), 85 are operational. The SED contributions associated with these 85 projects has amounted to R 1.8 billion to date.

In terms of ED and SED spend, education, social welfare, and health care initiatives have a SED focus. SED spend on education has been almost double the expenditure on enterprise development. In this regard IPPs have supported 1 388 education institutions with a total of R437 million in contributions, from 2015 to the end of June 2021. A total of 1 276 bursaries, amounting to R210.8 million, have been awarded by 67 IPPs from 2015 until the end of June 2021. The largest portion of the bursaries were awarded to African and Coloured students (97.4%), with women and girls receiving 56.3% of total bursaries. The Northern Cape province benefitted most from the bursaries awarded, with 57.2%, followed by the Eastern Cape (20.2%) and Western Cape (14.1%). Enterprise development and social welfare are the focus areas that have received the second highest share of the contributions to date.

The Green Jobs study (2011) found that the case for renewable energy is enhanced by the positive effect on rural or regional development. Renewable energy facilities located in rural areas create an opportunity to benefit the local and regional economy through the creation of jobs and tax revenues. The SED contributions do therefore create significant benefits for local rural communities. However, the funds can be mismanaged. This is an issue that will need to be addressed when allocating SED funds.

The assessment of benefits associated with socio-economic development contributions is indicated in **Table 9-123**.

Table 9-123 – Impact assessment of benefits associated with socio-economic development contributions during the operational phase

Potential Impact: Benefits associated with socio-economic development contributions	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	N/A	4	4	36	Moderate	(+)
With Mitigation	4	3	N/A	4	5	55	Moderate	(+)
Enhancement	▪ The proponents should liaise with the municipalities to identify projects that can be supported by SED							

	contributions. ▪ Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community. ▪ Strict financial management controls, including annual audits, should be instituted to manage the SED contributions.

Visual impact and impact on sense of place

The proposed SEF has the potential to impact on the areas existing rural sense of place. However, given the location of the site next to the existing Thukuka Power station and associated fly ash dump the potential impact on the areas sense of place is likely to be limited. The visual character of the area has also been impacted by power lines associated with the Eskom substations.

The findings of the Visual Impact Assessment (VIA) (Scientific Aquatic Services, July 2023) are summarised below.

The proposed Tournée 2 Solar PV Facility is situated in a rural area with a relatively low number of sensitive receptors; comprising mostly of farmsteads. Based on the field assessment, the undulating topography and dense vegetation associated with the farmsteads partially obscures the view towards the Tournée 2 Solar PV Park, therefore the visual impact for the Tournée 2 Solar PV Facility is Facility is considered moderately low as the visual intrusion on the receiving environment will be low to moderate depending on the location of the vantage point. The Tutuka ash dump will assist in screening and/ or absorbing the Tournée 2 Solar PV Park, especially to receptors located to the south and north. In terms of significance the impact on local farmsteads in the vicinity of the site was rated a Moderate Negative with and without mitigation. The potential impact associated with nighttime lighting was rated as Low Negative with and without mitigation.

In conclusion the VIA notes that from a visual resource aspect, there are no fatal flaws associated with the Tournée 2 Solar PV Park. Hence, it is the professional opinion of the visual specialist that the development of the Tournée 2 Solar PV Park, from a visual resource management perspective, can be considered for authorisation.

The visual impact and impact on sense of place is indicated in **Table 9-124**.

Table 9-124 – Visual impact and impact on sense of place during the operational phase

Potential Impact: Visual impact and impact on sense of place	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	3	**33**	**Moderate**	(-)
With Mitigation	2	2	3	4	3	**33**	**Moderate**	(-)

Mitigation and Management Measures	▪ The recommendations contained in the VIA should also be implemented

Potential impact on property values

The potential visual impacts associated with the proposed WEF have the potential to impact on property values. Based on the results of a literature review undertaken for wind farms the potential impact on property values in rural areas is likely to be limited. This is also likely to apply to PV SEFs. In this regard a study undertaken in Australia in 2016 (Urbis Pty Ltd) found that:

- There is limited available sales data to make a conclusive finding relating to value impacts on residential or lifestyle properties located close to wind farm turbines, noting that wind farms in NSW have been constructed in predominantly rural areas.

Based on the findings of the literature review the impact of the proposed PV SEF on property values is therefore likely to be low, specifically given the location of the site adjacent to the Thukuka Power station and associated fly ash dump.

The assessment of potential impact on property values and operations is indicated in **Table 9-125**.

Table 9-125 – Impact assessment of potential impact on property values and operations during the operational phase

Potential Impact: Impact on property values	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	N/A	4	2	16	Low	(-)
With Mitigation	2	1	N/A	4	2	14	Very Low	(-)
Mitigation and Management Measures	▪ The recommendations contained in the VIA should be implemented							

Potential impact on tourism

The potential visual impacts associated with the proposed PV SEF have the potential to impact on tourism facilities and tourism in the area. Based on the findings of the literature review there is limited evidence to suggest that the proposed PV SEF would impact on the tourism in the LM and or GSDM. Based on the findings of the SIA there are no tourism related facilities in close proximity to the site that would be impacted by the PV SEF.

As indicated above, the study area is also located next to the existing Thukuka Power station and associated fly ash dump. The visual character and quality of the area has therefore been impacted by these activities and the power lines associated with the Eskom substations.

The impact on tourism in the region is indicated in **Table 9-126**.

Table 9-126 – Impact on tourism during the operational phase

Potential Impact: Tourism	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	2	N/A	4	2	14	Very Low	(-)
With Mitigation	1	2	N/A	4	2	14	Very Low	(-)
Mitigation and Management Measures	▪ The recommendations contained in the VIA should be implemented							

9.10.3 DECOMMISSIONING PHASE

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the proposed facility the decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in the 20 - 25 years of post-commissioning. The decommissioning phase is therefore likely to create additional construction type jobs, as opposed to the jobs losses typically associated with decommissioning.

Given the relatively small number of people employed during the operational phase (~ 20), the social impacts at a community level associated with decommissioning will be limited. In addition, potential impacts associated with the decommissioning phase can be effectively managed with the implementation of a retrenchment and downscaling programme.

The assessment of social impacts associated with decommissioning is indicated in **Table 9-127**.

Table 9-127 – Social impacts associated with decommissioning during the decommissioning phase

Potential Impact: Social impacts associated with decommissioning	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	N/A	2	3	18	Low	(-)
With Mitigation	1	2	N/A	2	3	15	Very Low	(-)
Mitigation and Management Measures	▪ The proponent should ensure that retrenchment packages are provided for all staff retrenched when the plant is decommissioned.							

	▪ All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning. ▪ Revenue generated from the sale of scrap metal during decommissioning should be allocated to funding closure and rehabilitation of disturbed areas.

9.11 DESKTOP GEOTECHNICAL ASSESSMENT

9.11.1 CONSTRUCTION PHASE

The construction phase could include the following impacts: Increased stormwater velocity. Increase in soil and wind erosion due to clearing of vegetation. Creation of drainage paths along access tracks. Sedimentation of non-perennial features and excessive dust.

Table 9-128 –Construction Impacts on Soil erosion

Potential Impact: Soil erosion	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	3	3	3	4	**48**	**Moderate**	(-)
With Mitigation	2	1	1	2	2	**12**	**Very low**	(-)
Mitigation and Management Measures	▪ Rehabilitation of affected areas (such as revegetation). ▪ Construction of temporary berms and drainage channels to divert surface water. ▪ Minimize earthworks and fills. ▪ Use existing road network and access tracks. ▪ Correct engineering design and construction of gravel roads and water crossings. ▪ Control stormwater flow.							

Table 9-129 –Construction Impacts from oil spillages

Potential Impact: Contamination of ground and surface water resources from heavy plant leading to quality deterioration of the water resources.	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	3	3	3	4	**48**	**Moderate**	(-)
With Mitigation	2	1	1	2	2	**12**	**Very low**	(-)

Mitigation and Management Measures	▪ Vehicle and construction machinery repairs to be undertaken in designated areas with proper soil protection. ▪ Frequent checks and conditional monitoring

Table 9-130 –Construction Impacts from disturbance of fauna and flora

Potential Impact: The displacement of natural earth material and overlying vegetation leading to erosion.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	3	3	2	18	Low	(-)
With Mitigation	2	1	1	2	2	12	Very low	(-)
Mitigation and Management Measures	▪ Limit and control excavations where possible							

Table 9-131 –Construction Impacts on Slope stability

Potential Impact: Slope instability around structures.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	3	3	2	18	Low	(-)
With Mitigation	1	1	3	2	2	14	Very low	(-)
Mitigation and Management Measures	▪ Avoid steep slope areas. ▪ Design cut slopes according to detailed geotechnical analysis.							

Table 9-132 –Construction Impacts on Seismic activity

Potential Impact: Damage of proposed development.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	1	3	4	1	**12**	**Very low**	(-)
With Mitigation	2	1	3	3	1	**9**	**Very low**	(-)
Mitigation and Management Measures	▪ Design according to expected peak ground acceleration.							

9.11.2 OPERATIONAL PHASE

Table 9-133 –Operational Impacts on Soil Erosion

Potential Impact: Increase in soil and wind erosion due to clearance of structures. **• Displacement of soil and damage to vegetation by vehicles**	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	3	2	2	**16**	**Low**	(-)
With Mitigation	1	1	1	1	1	**4**	**Very low**	(-)
Mitigation and Management Measures	▪ Use existing road network and access tracks. ▪ Use of temporary berms and drainage channels to divert surface water. ▪ Minimize earthworks and demolish footprints. ▪ Rehabilitation of affected areas (such as revegetation). ▪ Reinstate channelized drainage features. ▪ Strip, stockpile and re-spread topsoil.							

Table 9-134 –Operational Impacts from Oil Spillages

Potential Impact: Potential oil spillages from service vehicles and heavy plant.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	5	5	3	**45**	**Moderate**	(-)

With Mitigation	1	1	1	1	1	**4**	**Very low**	(-)
Mitigation and Management Measures	▪ Vehicle repairs to be undertaken in designated areas.							

9.11.3 DECOMMISSIONING PHASE

The decommissioning impacts are expected to be the same as the construction impacts, therefore the same mitigation measures should be applied.

9.12 HIGH LEVEL SAFETY, HEALTH AND ENVIRONMENTAL RISK ASSESSMENT

An analysis was undertaken for the BESS to identify the failure events, their causes, consequences, as well as the preventative and mitigation measures in place on the proposed installation for all three phases of a typical project.

A summary of the impacts for the construction, operation and decommissioning phases is indicated in **Table 9-135**. The full impact assessment is included in **Appendix H.13**.

Table 9-135 – Summary of High Level Safety, Health and Environmental Risk Impacts for BESS

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
High Level Safety, Health and Environmental Risk Assessment	Human Health - chronic exposure to toxic chemical or biological agents	C	(-)	Moderate	Low
	Human Health - exposure to noise	C	(-)	Moderate	Low
	Human Health - exposure to temperature extremes and/or humidity	C	(-)	Low	Very Low
	Human Health - exposure to psychological stress	C	(-)	Low	Low
	Human Health - exposure to ergonomic stress	C	(-)	Low	Low
	Human and Equipment Safety - exposure to fire radiation	C	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to explosion over pressures	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	C	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Human and Equipment Safety - exposure to electromagnetic waves	C	(-)	Moderate	Low
	Environment - emissions to air	C	(-)	Low	Very Low
	Environment - emissions to water	C	(-)	Low	Low
	Environment - emissions to earth	C	(-)	Low	Low
	Environment - waste of resources e.g., water, power etc	C	(-)	Low	Very Low
	Public - Aesthetics	C	(-)	Low	Low
	Investors - Financial	C	(-)	Moderate	Low
	Employees and investors - Security	C	(-)	Moderate	Low
	Emergencies	C	(-)	Moderate	Low
	Investors - Legal	C	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	O	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	O	(-)	Moderate	Low
	Human Health - exposure to noise	O	(-)	Moderate	Low
	Human Health - exposure to temperature extremes and/or humidity	O	(-)	Low	Very Low
	Human Health - exposure to psychological stress	O	(-)	Low	Very Low
	Human Health - exposure to ergonomic stress	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to fire radiation	O	(-)	High	Low
	Human and Equipment Safety - exposure to fire radiation	O	(-)	High	Low
	Human and Equipment Safety - exposure to explosion over pressures	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	O	(-)	Low	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to electromagnetic waves	O	(-)	Moderate	Low
	Environment - emissions to air	O	(-)	Low	Very Low
	Environment - emissions to water	O	(-)	Low	Low
	Environment - emissions to earth	O	(-)	Low	Very Low
	Environment - waste of resources e.g., water, power etc	O	(-)	Low	Very Low
	Public - Aesthetics	O	(-)	Low	Low
	Investors - Financial	O	(-)	Moderate	Low
	Employees and investors - Security	O	(-)	Moderate	Low
	Employees and investors - Security	O	(-)	Moderate	Low
	Emergencies	O	(-)	Moderate	Low
	Investors - Legal	O	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	D	(-)	N/A	N/A
	Human Health - exposure to noise	D	(-)	N/A	N/A
	Human Health - exposure to temperature extremes and/or humidity	D	(-)	N/A	N/A
	Human Health - exposure to psychological stress	D	(-)	N/A	N/A
	Human Health - exposure to ergonomic stress	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to fire radiation	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to explosion over pressures	D	(-)	N/A	N/A

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to electromagnetic waves	D	(-)	N/A	N/A
	Environment - emissions to air	D	(-)	N/A	N/A
	Environment - emissions to water	D	(-)	N/A	N/A
	Environment - emissions to earth	D	(-)	Moderate	Low
	Environment - waste of resources e.g., water, power etc	D	(-)	N/A	N/A
	Public - Aesthetics	D	(-)	N/A	N/A
	Investors - Financial	D	(-)	N/A	N/A
	Employees and investors - Security	D	(-)	N/A	N/A
	Emergencies	D	(-)	N/A	N/A
	Investors - Legal	D	(-)	Moderate	Low

Mitigation measures for the construction, operation and decommissioning phases includes:

- The construction phase will be managed according to all the requirements of the Occupational Health and Safety Act No. 85 of 1993 specifically the Construction Regulations.
- SHEQ policy in place.
- A detailed construction Risk Assessment prior to work.
- SHE procedure in place.
- PPE to be specified.
- SHE appointees in place.
- Contractor's safety files in place and up to date.
- All necessary health controls/ practices to be in place, e.g., ventilation of welding and painting areas.
- SHE monitoring and reporting programs in place.
- Emergency response plan to be in place prior to beginning construction and to include aspects such as appointment of emergency controller, provision of first aid, first responder contact numbers.
- Health Risk Assessment to determine if equipment noise exceeds 85dB at workstation and 61dB at boundary of the site
- Employees to be provided with hearing protection if working near equipment that exceeds the noise limits.
- Construction site facilities to comply with Occupational Health and Safety Act No. 85 of 1993 specifically the thermal, humidity, lighting and ventilation requirements of the Environmental Regulations for Workplaces.
- Adequate potable water for employees to be provided during all phases of the project. Bore hole, bowser and tank or small water treatment plant may be required to provide potable water for the BESS installation staff during all phases of the project.
- Training in lifting techniques.
- Ensure that despite the isolated location all the necessary equipment is available (and well maintained) during construction. Otherwise employees may revert to unsafe practices. Isolated location, maintenance of construction equipment to ensure safe operation is critical. Ensure this is in place prior to project beginning.
- Fuels stored on site in dedicated, demarcated and bunded areas.
- Suitable fire-fighting equipment on site near source of fuel, e.g., diesel tank, generators, mess, workshops etc.
- Solid state battery design includes abuse tests such as drop test, impact, rapid discharge etc. Propagation tests for systems, e.g., heat insulating materials between cells/modules. Factory acceptance test prior to prior to leaving manufacture. Batteries are usually stored at 50% charge to prolong life but may be shipped fully discharged. This level of detail should be understood to assess the risk during transport and storage.
- The company responsible for the battery installation should ensure suitably competent transport companies are appointed.
- Prior to bringing any containers into the country, the company responsible for the battery installation (possibly via appointed contractors) should ensure that an Emergency response plan is in place for the full route from the ship to the site. Drivers trained in the hazards of containerized batteries.

- All necessary good hygiene practices to be in place, e.g., provision of toilets, eating areas, infectious disease controls.
- Policies and practice for dealing with known vectors of disease such as Aids, TB, COVID 19 and others.
- Awareness training for persons on site, safety induction to include animal hazards.
- First aid and emergency response to consider the necessary anti-venom, anti-histamines, topical medicines etc.
- Due to isolated locations some distance from town, the ability to treat with anti-venom and extreme allergic reactions on site is critical to mitigate the impacts
- Appointed transport company to ensure transport in accordance with Regulation 8 of the National Road Traffic Act 93 of 1996, Dangerous Goods. Not permitted to transport prescribed goods in manner not consistent with the prescriptions, e.g., consignor and consignee responsibilities. Prescription found in SANS 10228/29 and international codes for battery transport etc.
- Transport in sealed packages that are kept upright, protected from movement damage etc.
- Also packaged to ensure no short-circuiting during transport.
- Transport to prevent excessive vibration considerations as battery internal may be damaged leading to thermal run-away during commissioning.
- Pre-assembled containers will most likely be supplied. These will be fitted with the necessary protective measures by the supplier considering marine and road transport as well as lifting, setting down etc.
- Route selection to consider possible incidents along the way and suitable response, e.g., satellite tracking, mobile communication, 24/7 helpline response.
- Standard dangerous goods requirements for Hazmat labels, Trem cards, driver trained in the hazards of the load.
- There will be packaging materials that will need to be disposed of after the entire system is connected and commissioned as well as after regular maintenance.
- There will need to be waste segregation (e.g., electronic equipment, chemicals) and management on the site.
- Water usage to be monitored on site during construction.
- Handling protocols to be provided by battery supplier.
- End of Life plan needs to be in place before any battery containers enter the country as there may be damaged battery unit from day 1.
- Water management plan and spill containment plans to be in place.
- Fencing around electrical infrastructure to SANS standard and Eskom Guidelines.
- The hazardous nature of the electrical and battery equipment should be clearly indicated – e.g., Skull and Cross Bones or other signs.
- Night lighting to be provided both indoors and outdoors where necessary.
- If batteries are stored at 50% charge, thermal run away can happen while in storage on site waiting for installation. In addition, if involved in an external fire thermal run away can happen even with uncharged batteries. Except during shipping, ideally the units should not be stored any closer to each other than they would be in the final installation so that propagation is prevented, i.e. laydown area needs to be considered.
- The company in charge of the containers at each stage in the transport process needs to be very clear so that responsibility for the integrity of the load and protection of the persons involved in transfer and coordination of emergency response on-route. E.g., if purchased from Tesla where does hand over occur to the South African contractor / owner, at the factory door in USA, at the

port in RSA, at the site fence. For example, who will be accountable if there’s thermal runway event on a truck with a container that stops in a small town for driver refreshments.

- Use only internationally reputable battery suppliers who comply with all known regulations/guideline at the time of purchasing.
- Ensure only state of the art battery systems are used and not old technologies prone to fires/explosions etc.
- The operation and maintenance phase will be managed according to all the requirements of the Occupational Health and Safety Act 85 of 1993.
- A detailed Risk Assessment of all normal operating and maintenance activities on site to be compiled, and form the basis of operating instructions, prior to commencing commissioning.
- All necessary health controls/ practices to be in place, e.g., ventilation of confined areas, occupational health monitoring if required and reporting programs in place.
- Emergency response plan for full operation and maintenance phase to be in place prior to beginning commissioning
- Maintenance procedures will be in place should equipment need to be opened, e.g., pumps drained and decontaminated prior to repair in workshop etc.
- PPE will be specified for handling battery parts and other equipment on site.
- Training of staff in hazards of chemicals on site.
- Possible detectors with local alarms if regulated occupational exposure limits are exceeded etc prior to entry for inspection of battery containers.
- Labelling of all equipment.
- Confined space entry procedures if entering tanks.
- There needs to be careful thought given to procedures to be adopted before entering into the BESS or a container particularly after a BMS shut down where there may be flammable or toxic gases present, a fire etc.
- Safety Data Sheets (SDSs) to be available on site.
- Operating manuals to be provided including start-up, shut-down, steady state, monitoring requirements.
- Maintenance manuals with make safe, decontamination and repair procedures.
- Proposed maintenance schedules e.g., checklists for weekly, monthly, annual etc.
- Provided portable equipment for calibration and for testing/verification of defective equipment, e.g., volt/current meters, infrared camera
- Ensure containers are temperature controlled as required to remain within the optimal battery operating temperature range.
- Lighting to be provided inside any buildings, inside the containers, possibly linked to the door opening and outdoors where necessary.
- Adequate potable water to be provided during all phases of the project.
- Suitable lighting to be provided including emergency lighting for safe building exit in the event of power failure.
- PPE for operations and maintenance staff to be suitable for the weather conditions.
- Staff rotation to other activities within the site may be necessary.
- Performance monitoring of inspections / maintenance tasks in particular will be necessary.
- Working at height procedure to be in place.
- Grass cutting and fire breaks around the BESS installations to prevent veld fires. No combustible materials to be stored in or near the batteries or electrical infrastructure. Separation of site diesel tank, transformers from BESS and vice versa.

- There are BESS design codes from the USA and standards of practice that can be used e.g., UL9540, NFPA 855 and DNV GL RP 43.
- Detailed FMEA/Hazop/Bowtie to done during design at the component level and system levels. Safety integrity level rating of equipment (failure probably) with suitable redundancy if required. Site Acceptance Testing as part of commissioning of each unit and the overall system. Abuse tests conducted by supplier.
- BMS should be checking individual cell voltage as well as stack, module, container, system voltages/current etc. BMS tripping the cell and possibly the stack/ building unit or module/rack/container, if variations in voltage. Diagnostics easily accessible. Diagnostics able to distinguish cell from stack or cell from module faults. Protective systems are only as good as their reliability and functionality testing is important, e.g., testing that all battery trips actually work. Fire resistant barrier between the batteries and the PCS side if in the same container, or separate containers.
- Suitable ingress protection level provided for electrical equipment, e.g., IP55 - 66. If air cooling into container, suitable dust filters to be provided. Smoke detectors linked to BMS & alerts in control room.
- Effects of battery aging to be considered. Solid state battery life starts to be impacted above 40 °C and significant impacts above 50 °C with thermal run away starting at 65-70 °C. BMS trips system at 50 °C. Temperature monitoring to be in place. Regular infrared scanning. Data needs to be stored for trend analysis.
- Data indicates an event frequency of 0.001 per installation and with up to 200 units this would mean an event once 5 years, i.e. a high probability event. Most events will be small not resulting in injuries, but this is possible if the event is not controlled.
- Prior to commencement of cold commissioning, emergency plan from transport and construction phase to be extended to operational phase and to include the hazards of the electrically live system. Procedure to address solid state container fires - extinguishing, ventilating, entering as appropriate or not. PPE for container firefighting include fire retardant, chemically resistant, nitrile gloves, antistatic acid resistant boots, fill face shields, BA sets.
- A planned fire response to prevent escalation to an explosion or an environmental event.
- Suitable supply of fire extinguishing medium and cooling medium
- Consider fire water for cooling adjacent equipment – BESS units.
- Can use fogging nozzles to direct smoke.
- Ensure procedures in place for clean up after event Lingering HF and other toxic residues in the soil and on adjacent structures.
- Procedures to be in place for IR scanning (or other suitable method) to determine if batteries are still smouldering / are sufficient cooled to handle as batteries may still be active some weeks after an event.
- Smoke or gas detector systems that are not part of the original battery container package, need to be linked to the main control panel for the entire system so that issues can be detected and responded to rapidly..
- Undertake a hazardous area classification of the inside of the container to confirm the rating of electrical equipment, due to possible leaks of electrolyte or generation of flammable gases under thermal run away. Emergency response plan and employee training referred to above is critical.
- Suitable training of selected emergency responders who may be called out to the facilities is critical.
- Apart from pumps, no major moving parts during operation.

- Maintenance equipment to be serviced and personnel suitably trained in the use thereof.
- Normally just small vehicles on site, bakkies, grass cutting, cherry-pickers etc. Possibly large cranes if large equipment or elevated structure removed/replaced.
- Traffic signs, rules etc. in place on site.
- All normal working at heights, hot work permits, confined space entry, cordon off unsafe areas/works etc. to be in place.
- Emergency response plan.

For a full list of mitigation measures refer to the EMPr (**Appendix I**) and Specialist Study (**Appendix H.13**).

10 CUMULATIVE IMPACT ASSESSMENT

Although the objective of the NEMA process is to undertake an impact and risk assessment process, inclusive of cumulative impacts, which is essential to assessing and managing the environmental and social impacts of projects, it may be insufficient for identifying and managing the incremental impacts on areas or resources used or directly affected by a given development from other existing, planned, or reasonably defined developments at the time the risks and impacts are identified.

IFC PS 1 recognizes that, in some instances, cumulative effects need to be considered in the identification and management of environmental and social impacts and risks. For private sector management of cumulative impacts, IFC considers good practice to be two pronged:

- Effective application of and adherence to the mitigation hierarchy in environmental and social management of the specific contributions by the project to the expected cumulative impacts; and
- Best efforts to engage in, enhance, and/or contribute to a multi-stakeholder, collaborative approach to implementing management actions that are beyond the capacity of an individual project proponent.

Even though Performance Standard 1 does not expressly require, or put the sole onus on, private sector clients to undertake a cumulative impact assessment (CIA), in paragraph 11 it states that the impact and risk identification process "*will take into account the findings and conclusions of related and applicable plans, studies, or assessments prepared by relevant government authorities or other parties that are directly related to the project and its area of influence" including "master economic development plans, country or regional plans, feasibility studies, alternatives analyses, and cumulative, regional, sectoral, or strategic environmental assessments where relevant*."

Cumulative impacts are those that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones. For practical reasons, the identification and management of cumulative impacts are limited to those effects generally recognized as important on the basis of scientific concerns and/or concerns of affected communities (IFC GPH).

Evaluation of potential cumulative impacts is an integral element of an impact assessment. In reference to the scope for an impact assessment, IFC's Performance Standards specify that "*Risks and impacts will be analysed in the context of the project's area of influence. This area of influence encompasses…areas potentially impacted by cumulative impacts from further planned development of the project, any existing project or condition, and other project-related developments that are realistically defined at the time the Social and Environmental Assessment is undertaken; and (iv) areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location.*" (IFC 2006).

A cumulative impact assessment is the process of (a) analysing the potential impacts and risks of proposed developments in the context of the potential effects of other human activities and natural environmental and social external drivers on the chosen Valued Environmental and Social Components (VECs) over time, and (b) proposing concrete measures to avoid, reduce, or mitigate such cumulative impacts and risk to the extent possible (IFC GPH).

Cumulative impacts with existing and planned facilities may occur during construction and operation of the proposed Tournée 2 Solar PV Facility. While one project may not have a significant negative impact on sensitive resources or receptors, the collective impact of the projects may increase the severity of the potential impacts.

Renewable energy developments within the surrounding area which have submitted applications for environmental authorisation have been included in this cumulative impact assessment. It is important to note that the existence of an approved EA does not directly equate to actual development of the project. Only one projects within 30 km of the Tournée 2 Solar PV Facility site was identified:

- 65.9 MW Tutuka PV Energy Facility and Its associated Infrastructure on portion 4, 10, 11 and 12 of the Farm Pretorius Vley 374 is near Standerton within Lekwa, Mpumalanga Province. Applicant: Eskom Holdings SOC Limited. Status: Approved. DFFE Ref: 14/12/16/3/3/2/754

The existing surrounding project is included in **Figure 10-1**.

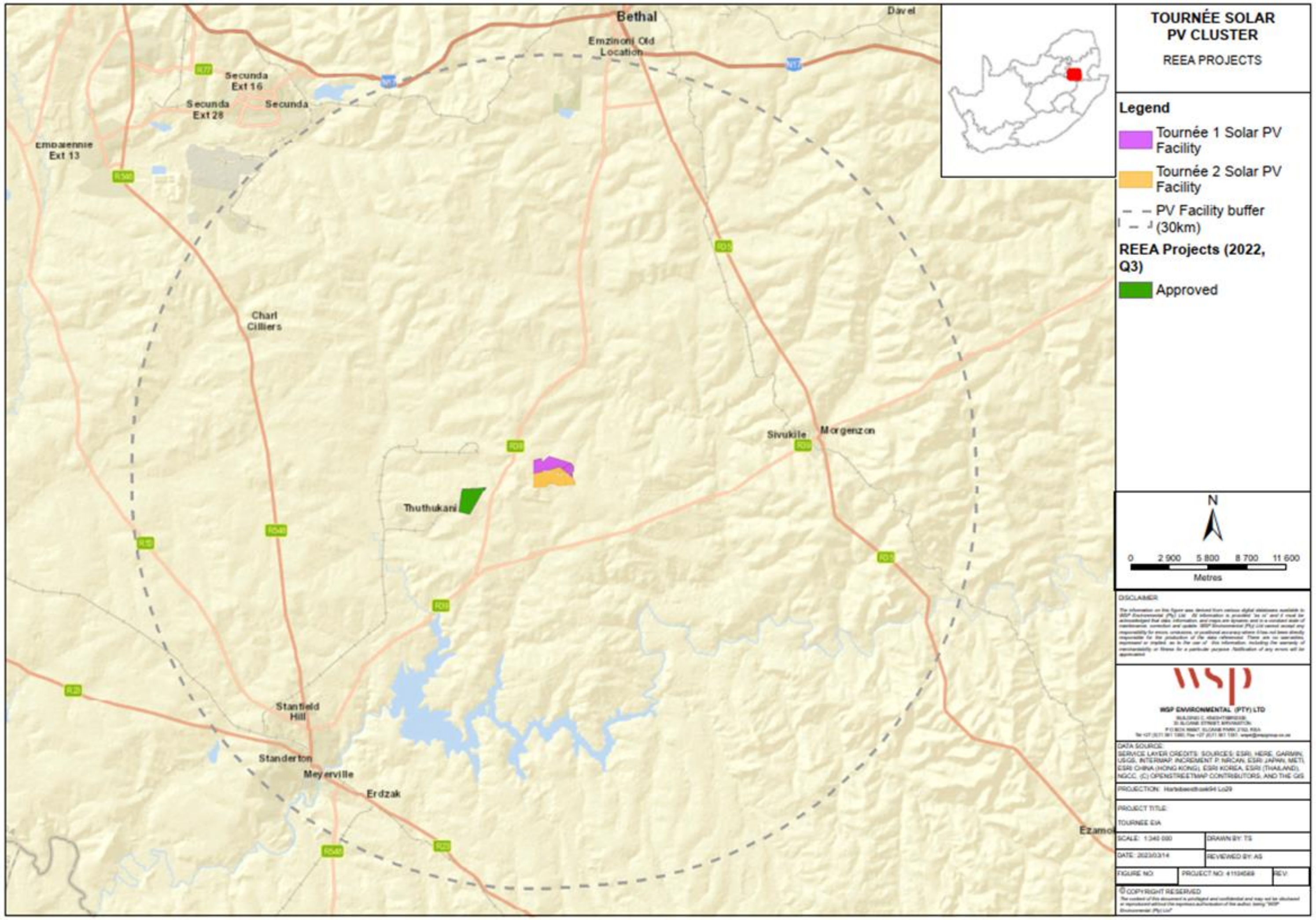


Figure 10-1 - Renewable Energy Projects with 30km of the Tournée Solar PV Facilities

10.1 SOIL, LAND USE AND LAND CAPABILITY

The development footprint presents areas of active cultivation where maize and soybeans are currently cultivated. The yield potential for maize is approximately 8 tons per hectare while the soybeans is 3 tons per hectare. The cultivated areas are therefore regarded important from an agricultural point of view and as such this is deemed to be a constraint for this project.

According to the desk-based assessment the grazing capacity for this area is 4 Hectares per animal which is considered adequate for commercial farming. It was also evident during the site verification that the grazing land was utilised for fodder which means that these areas are actively used for commercial purposes. As such, this also presents a constraint for this project. The loss of agricultural soils and the permanent change in land use will be localised to within the study area. The integrated mitigation measures must be implemented accordingly, with the aim of minimising the potential loss of these valuable soils considering the need for sustainable development.

The cumulative impact on the local and regional scale is considered medium without mitigation and low with mitigatory measures in place as the dominant soils are not sensitive from a soil and land capability point of view.

10.2 AQUATIC BIODIVERSITY

Freshwater ecosystems within the Mpumalanga region are under continued threat due a variety of factors primarily related to landuse which include cultivation, livestock grazing, mining activities and linear developments. These impacts have resulted in degradation of freshwater features due to physical transformation of freshwater ecosystems which alter the geomorphological process, hydraulic regime and vegetation community of these systems.

The proposed Tournée 2 Solar PV Facility will not impact any freshwater ecosystems in terms of the development of its solar arrays as no freshwater ecosystems are located in close proximity (within 32m of the CVB wetland) to the proposed solar array footprint. The only potential impact relates to the stormwater management of the proposed project. However, the correct design of the stormwater management systems and implementation of the recommended mitigation measures would however significantly reduce the potential for cumulative impacts to materialise.

Anticipated impacts to the freshwater ecosystems include an increase in alien and invasive species entering the system due to regular disturbance of soils and removal of indigenous vegetation due to the increased activity in the area. This results in greater inputs of sediment, and nutrients from runoff. As well as potential conveyance of contaminated water or excess sediment loads from the construction footprint area. The impacts of the proposed Tournée 2 Solar PV Facility on the reach of the identified freshwater ecosystems are unlikely to significantly add to the cumulative impacts on the systems, as the proposed activities are located outside the delineated boundaries of the CVB wetland and the associated NEMA 32m ZoR and provided that the recommended mitigation measures, as set out in this report, are implemented. With management and mitigation measures implemented during the construction and operation phases, the impacts can further be reduced, thus no significant contribution to the above mentioned cumulative impacts on the systems from this project are considered likely.

10.3 PLANT SPECIES

For the assessment of potential cumulative impacts to vegetation and plant species associated with Tournée 2 Solar PV Park, consideration was given to past, present, and future (known) projects and natural drivers that affect these aspects. Three areas of concern were identified for Tournée 2 Solar PV Park:

- Additional (known) planned projects in the area.
- Habitat fragmentation.
- Spread of AIPs.

According to the South African Renewable Energy EIA Application Database (2022), there is only one application for renewable energy facilities (wind and solar) within a 30 km radius of the Tournée 2 Solar PV Park, namely the 65.9 MW Tutuka PV Energy Facility and its associated infrastructure on portion 4, 10, 11 and 12 of the Farm Pretorius Vley 374, near Standerton within Lekwa, Mpumalanga Province (Applicant: Eskom Holdings SOC Limited. Status: Approved. DFFE Ref: 14/12/16/3/3/2/754). This indicates that apart from the Tournée 2 Solar PV Facility, there are additional renewable energy developments planned within the area.

Moreover, immediately north of the Tournée 2 Solar PV Facility, there is an application for the Tournée 1 Solar PV Facility . As such, if the project is authorised, there will be a cumulative loss of habitat in the area and specifically habitat associated with the remaining extent of the Soweto Highveld Grassland and associated floral SCCs. However, in terms of known renewable energy projects in the larger area, the Tournée 2 Solar PV Facility is unlikely to contribute towards cumulative impacts in the area which are of unacceptably high significance. This does not, however, consider additional planned developments such as mining projects and/or urban developments within the area (for which less details were available) and there could therefore be more significant, cumulative impacts associated with the proposed Tournée 2 Solar PV Facility in terms overall habitat loss within the area.

The proposed project could further impact on the floral habitat and diversity as well as floral SCC through fragmentation of natural habitat. The habitat is already significantly fragmented by cultivation and very few movement and dispersal corridors remain in the landscape between the remaining extent of natural grasslands (i.e., the Soweto Highveld Grassland).

The proposed layout of the Tournée 2 Solar PV Facility has ensured that the CVB wetlands will not directly be impacted by the development and that these features will not be fragmented. As such, despite the definite fragmentation of the Grassland Habitat, the remaining CVB wetlands will allow for some connectivity to remain between natural patches of vegetation within the area. The cumulative impact from additional fragmentation to the landscape is therefore not anticipated to be significantly (or unacceptably) high in the long-term.

AIPs are reported to be one of the greatest threats to biodiversity and are closely associated with disturbance; these species are able to colonise disturbed areas rapidly. Several sections of Tournée 2 Solar PV Facility are already associated with AIP proliferation and, if not controlled, these species can continue to spread across the landscape, resulting in a cumulative loss of indigenous floral species and potential permanent displacement of floral SCC and their habitat. Ongoing degradation of the remaining extent of the Soweto Highveld Grassland due to uncontrolled spread of AIPs could result in a significant, cumulative loss of the VU vegetation type within the area; however, the spread of AIPs is deemed mitigatable and is not anticipated to be a significant issue that could rise from the Tournée 2 Solar PV Facility's activities (if sufficiently mitigated).

Given that the Tournée 2 Solar PV Facility will be decommissioned and rehabilitated, the cumulative loss of habitat and fragmentation of the landscape is deemed to be temporary.

10.4 ANIMAL SPECIES

Based on the general landscape and habitat within the project areas the site has the potential to host a moderately low to intermediate assemblage of fauna and potentially 4 SCC with one SCC namely *Aonyx capensis* (Cape Clawless Otter) confirmed. Three SCC have foraging and breeding habitat within the project footprint, as such, the development will result in the loss of breeding or foraging habitat for these species. One mammal SCC may potentially lose breeding habitat within the project areas as a result of the developments. While this SCC potentially breeds within the project areas it is not considered an important breeding locality for this species and the development is not likely to result in changes to breeding productivity, however, reductions in abundance within the project areas are likely. As a result of the extent over which the project area and other approved projects are proposed, faunal dispersal corridors are likely to be impacted. It is suggested that corridors using e.g. Freshwater Ecosystem Habitat be retained and managed intact and remain open to the surrounding area as far as possible by only installing perimeter fences where necessary, having culverts in the border fence line or other mechanisms to improve connectivity. The increased human activity may however result in animals avoiding the broader area due to consistent human activity during the construction phase, however human activity will likely reduce during the operational phase.

The proposed activities will lead to the loss of general habitat for faunal species within the development footprints and lead to a reduction in the abundance of fauna and a potential for local reductions in SCC presence. This will lead to the displacement of faunal species currently inhabiting these areas, driving them out into the surrounding vegetated areas, leading to increased competition for territories and breeding sites. Moreover, there is likely to be a knock-on dispersal effect, leading to increased resource competition and possible increased mortality rates as the carrying capacity is impacted, resulting in a decreased species abundance, decreased breeding potential and possible further loss of species diversity in the region. The significance of this impact is however limited provided that impacts on Freshwater Ecosystem habitat are avoided.

10.5 ARCHAEOLOGICAL AND CULTURAL HERITAGE

In terms of impacts to heritage resources, it is preferred that this kind of infrastructure development is concentrated in one location and is not sprawled across an otherwise agricultural landscape.

Based on available information, it seems that there is only 1 other solar facility in the area – this is as per the 2022_Q2 info from the DFFE - 65.9 MW Tutuka Photovoltaic (PV) Energy Facility and Its associated Infrastructure on portion 4, 10, 11 and 12 of the Farm Pretorius Vley 374 is near Standerton within Lekwa, Mpumalanga Province.Applicant: Eskom Holdings SOC Limited. Status: Approved. DFFE Ref: 14/12/16/3/3/2/754.

The proposed development is therefore likely to result in a change to the sense of place of the area however these impacts are assessed in the VIA and appropriate mitigation measures proposed.

10.6 TRAFFIC

This phase will have similar impacts and generated trips as the Construction Phase. The impact of the temporary increase in traffic, noise and dust pollution associated with potential traffic is indicated in **Table 9-103**.

For the cumulative impact during the construction phase, the 65.9 MW Tutuka PV Energy Facility Project and the proposed Tournée 1 Solar PV development have been considered. However, it is unlikely that these developments and the proposed Tournée 2 Solar PV development will exactly overlap with their construction period. In the event that the developments have similar construction periods, it is recommended to agree on a delivery schedule between the respective projects. The cumulative impact of traffic is indicated in **Table 10-1**.

Table 10-1 – Cumulative impact of increase in development trips during the construction phase

Potential Impact: Increase in Development Trips Further increase in development trips during the construction phase if all the projects listed will be constructed at the same time as Tournée 2 Solar.	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	4	2	2	4	44	Moderate	(-)
With Mitigation	3	4	1	2	3	30	Low	(-)
Mitigation and Management Measures	▪ Same as for the Construction phase. ▪ Stagger components delivery to site. ▪ Reduce the construction period where possible. ▪ Stagger the construction phase. ▪ Use of mobile batch plants and quarries in close proximity to the site to decrease the impact on the surrounding road network. ▪ Staff and general trips should occur outside of peak traffic periods as much as possible. ▪ Maintenance of haulage routes. ▪ Design and maintenance of internal roads. Possibly provide two access points to the site to split construction vehicle trips and reduce the risk of congestion							

10.7 VISUAL

Cumulative visual impacts resulting from landscape modifications as a result of the proposed project in conjunction Tournée 1 Solar PV Park and the other one approved application for renewable energy within a 50 km radius, as well as any future renewable energy facilities (wind and solar facilities) in the area, must be considered. Renewable energy facilities have the potential to cause large scale visual impacts and the location of several such developments in close proximity to each other could significantly alter the sense of place and visual character in the broader region. With the Tournée Cluster PVs situated adjacent to each other and only one other approved PVSEF within a 50 km radius, the cumulative impact is considered sequential overall, however for motorists traveling along the gravel road the cumulative impact may be considered combined. Furthermore, with the moderately low viewer incidence, the cumulative visual impacted is expected to be of moderately low significance.

The cumulative impact of additional traffic in the area on the local and regional roads as well as combined impacts from night-time lighting of the substations will affect the sense of place of the larger region. No cumulative impacts are anticipated from the proposed project and other future projects in the area which are of unacceptably high significance.

The cumulative visual impacts of PVSEFs on airfields can vary depending on several factors:

- Scale and size: Large PVSEFs can cover significant land areas and may be visible from the airfield or surrounding areas. The size and scale of the solar panels can create a noticeable change in the landscape. The sized of the Tournée 2 Solar PV Facility is relative, therefore there will be a noticeable change in the surrounding cultivated landscape.
- Glare and reflection: Glare from solar panels can potentially create visibility issues for pilots during critical phases of flight, such as take-off and landing. Proper panel orientation and glare-reducing measures can help mitigate this impact. Due to the axis of the airstrip and the angle of Tournée 2 Solar PV Facility , the likelihood of pilots experiencing glint and glare is considered low.
- Contrast and aesthetics: The contrast between a PVSEF and the surrounding landscape can affect the visual perception of the area. Some people may find the visual contrast appealing, while others may consider it visually intrusive or detracting from the natural or built environment. WithTournée Tournée 2 Solar PV Facility situated in close proximity to the Tutuka Power Station, the landscape is accustomed to energy generation infrastructure.
- Screen age: In some cases, visual screening or vegetation buffers may be installed around solar farms to minimize their visual impact. These buffers can consist of trees, shrubs, or other natural elements that help blend the solar farm into the surrounding environment.

It's important to note that authorities responsible for airfield operations and land use planning typically have specific guidelines and procedures in place to assess and manage the potential visual impacts of PVSEFs in proximity to airfields.

With the Tournée Solar PV Cluster and one other approved solar facility within a 50 km radius, the cumulative visual impact on civil aviation may be considered low, mainly due to the axis of the airstrip.

10.8 SOCIAL

10.8.1 SENSE OF PLACE

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

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

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

As indicated above, the potential impact of the proposed PV SEF and associated infrastructure on the areas sense of place is likely to be limited. The cumulative impacts are also likely to be low with mitigation, specifically given the location of the site next to the Thukuka Power station and associated fly ash dump.

The findings of the (VIA) (Scientific Aquatic Services, July 2023) indicate that renewable energy facilities have the potential to cause large scale visual impacts and the location of several such developments in close proximity to each other could significantly alter the sense of place and visual character in the broader region. With the Tournée Cluster PVs situated adjacent to each other and only one other approved PVSEF within a 50 km radius, the cumulative impact is considered sequential overall, however for motorists traveling along the gravel road the cumulative impact may be considered combined.

The cumulative impacts on sense of place and the landscape are indicated in **Table 10-2**.

Table 10-2 – Cumulative impact on regional employment and household income

Potential Impact: Sense of place	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Overall impact of the proposed project considered in isolation	2	2	3	4	2	**26**	**Low**	(-)
Cumulative impact of the project and other projects in the area	2	3	3	4	3	**36**	**Moderate**	(-)

Mitigation and Management Measures	▪ The recommendations contained in the VIA should be implemented

10.8.2 LOCAL SERVICES AND ACCOMMODATION

The establishment of a number of REFs has the potential to place pressure on local services and accommodation, specifically during the construction phase. The objective will be to source as many low and semi-skilled workers for the construction phase from the LM. This will reduce the pressure on local services and accommodation in the nearby towns, such as Standerton. The impact will however depend on the timing of the construction phase for the different projects. Based on the available information there are a limited number of renewable energy projects proposed within 30-50 km of the site. The potential cumulative impact on local services is therefore likely to the limited.

The potential impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of the proposed facility and associated renewable energy projects in the GMDM. These benefits will create opportunities for investment in the LM, including the opportunity to up-grade and expand existing services. This potential pressure on local services in the LM should therefore be addressed in the Integrated Development Planning (IDP) process undertaken by the LM.

The cumulative impact on local services is included in **Table 10-3**.

Table 10-3 – Cumulative impacts on local services

Potential Impact: Local Services	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Overall impact of the proposed project considered in isolation	2	3	N/A	2	2	**12**	**Very Low**	(-)
Cumulative impact of the project and other projects in the area	3	3	N/A	3	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ The proponent should liaise with the LM to address potential impacts on local services as part of the IDP process.							

10.8.3 LOCAL ECONOMY

In addition to the potential negative impacts, the establishment of renewable energy facilities and associated infrastructure, including the proposed SEF, will also create several socio-economic opportunities for the LM. The positive cumulative opportunities include creation of employment, skills development and training opportunities, and downstream business opportunities.

The potential cumulative benefits for the local and regional economy are associated with both the construction and operational phase of renewable energy projects and associated infrastructure and extend over a period of 20-25 years. However, steps must be taken to maximise employment opportunities for members from the local communities in the area and support skills development and training programmes.

The cumulative impact on local economy is indicated in **Table 10-4**.

Table 10-4 – Cumulative impacts on local economy

Potential Impact: Local Economy	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Overall impact of the proposed project considered in isolation	2	3	N/A	4	4	**32**	**Moderate**	(+)
Cumulative impact of the project and other projects in the area	4	3	N/A	4	5	**55**	**Moderate**	(+)
Enhancement	▪ The proponent should liaise with the LM to identify potential opportunities for the local economy and businesses as part of the IDP process.							

11 ENVIRONMENTAL IMPACT STATEMENT

The essence of any impact assessment process is aimed at ensuring informed decision-making, environmental accountability, and to assist in achieving environmentally sound and sustainable development. In terms of NEMA, the commitment to sustainable development is evident in the provision that "development must be socially, environmentally and economically sustainable…. and requires the consideration of all relevant factors…". NEMA also imposes a duty of care, which places an obligation on any person who has caused, is causing, or is likely to cause damage to the environment to take reasonable steps to prevent such damage. In terms of NEMA's preventative principle, potentially negative impacts on the environment and on people's environmental rights (in terms of the Constitution of the Republic of South Africa, Act No. 108 of 1996) should be anticipated and prevented, and where they cannot be prevented altogether, they must be minimised and remedied in terms of "reasonable measures".

In assessing the environmental feasibility of the proposed construction of the proposed Project, the requirements of all relevant legislation have been considered. The identification and development of appropriate mitigation measures that should be implemented to minimise potentially significant impacts associated with the project, has been informed by best practice principles, past experience, and the relevant legislation (where applicable).

The conclusions of this Draft EIA Report are the result of comprehensive assessments. These assessments were based on issues identified through the S&EIA process and public participation undertaken to date. The Draft EIA will be subject to public review, which will be undertaken according to the requirements of NEMA with every effort made to include representatives of all stakeholders within the process. The Draft EIA will be updated and finalised taking into consideration all comments received during the public review period before being submitted to the CA for consideration.

11.1 IMPACT SUMMARY

A summary of the identified impacts and corresponding significance ratings for the proposed project is provided in **Table 11-1**.

Table 11-1 – Impact Summary

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
Soil, Land use and Land Capability Assessment	Loss of land capability	P	(-)	High	Low
	Soil erosion	P	(-)	Low	Low
	Soil contamination	P	(-)	Moderate	Low
	Soil compaction	P	(-)	Moderate	Low
	Loss of land capability	C	(-)	High	Low
	Soil erosion	C	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Soil contamination	C	(-)	Moderate	Low
	Soil compaction	C	(-)	Moderate	Low
	Loss of land capability	O	(-)	Moderate	Low
	Soil erosion	O	(-)	Low	Low
	Soil contamination	O	(-)	Low	Low
	Soil compaction	O	(-)	Low	Low
Aquatic Biodiversity	Vegetation clearing	C	(-)	Moderate	Very Low
	Construction of infrastructure	C	(-)	Moderate	Very Low
	Operation and Maintenance	O	(-)	Low	Very Low
	Discharge of water from access roads	O	(-)	Moderate	Very Low
	Closure of the project and rehabilitation of the footprint area	D	(-)	Very Low	Very Low
Plant Species habitat and diversity	Grassland Habitat with PV facility and associated infrastructure	P	(-)	Low	Low
	Grassland Habitat with PV facility and surface infrastructure	P	(-)	Moderate	Low
	Grassland Habitat with PV facility and linear development	P	(-)	Low	Low
	Transformed Habitat with PV facility and associated infrastructure	P	(-)	Low	Very low
	Transformed Habitat with PV facility and surface infrastructure	P	(-)	Low	Very low
	Transformed Habitat with PV facility and linear development	P	(-)	Low	Very low
	Grassland Habitat with PV facility and associated infrastructure	C	(-)	Moderate	Moderate
	Grassland Habitat with PV facility and surface infrastructure	C	(-)	High	High
	Grassland Habitat with PV facility and linear development	C	(-)	Moderate	Moderate
	Transformed Habitat with PV facility and associated infrastructure	C	(-)	Low	Very low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Transformed Habitat with PV facility and surface infrastructure	C	(-)	Low	Very low
	Transformed Habitat with PV facility and linear development	C	(-)	Low	Very low
	Fresh water ecosystems with PV facility and surface infrastructure	C	(-)	Moderate	Low
	Fresh water ecosystems with PV facility and linear development	C	(-)	Moderate	Very Low
	Grassland Habitat with PV facility and associated infrastructure	O	(-)	Moderate	Low
	Grassland Habitat with PV facility and surface infrastructure	O	(-)	Moderate	Low
	Grassland Habitat with PV facility and linear development	O	(-)	Moderate	Moderate
	Transformed Habitat with PV facility and associated infrastructure	O	(-)	Very low	Very low
	Transformed Habitat with PV facility and surface infrastructure	O	(-)	Very low	Very low
	Transformed Habitat with PV facility and linear development	O	(-)	Very low	Very low
	Freshwater ecosystems with PV facility and surface infrastructure	O	(-)	Moderate	Low
	Freshwater ecosystems with PV facility and linear development	O	(-)	Moderate	Low
	Grassland Habitat with PV facility and associated infrastructure	D	(-)	Moderate	Low
	Grassland Habitat with PV facility and surface infrastructure	D	(-)	Moderate	Low
	Grassland Habitat with PV facility and linear development	D	(-)	Moderate	Low
	Transformed Habitat with PV facility and associated infrastructure	D	(-)	Very low	Very low
	Transformed Habitat with PV facility and surface infrastructure	D	(-)	Low	Very low
	Transformed Habitat with PV facility and linear development	D	(-)	Low	Very low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
Plant SCC	Grassland Habitat Threatened Floral SCC	P	(-)	Moderate	Low
	Grassland Habitat Protected Floral SCC	P	(-)	Moderate	Low
	Grassland Habitat Threatened Floral SCC	C	(-)	Moderate	Low
	Grassland Habitat Protected Floral SCC	C	(-)	Moderate	Low
	Freshwater ecosystems Threatened Floral SCC	C	(-)	Moderate	Low
	Freshwater ecosystems Protected Floral SCC	C	(-)	Moderate	Moderate
	Grassland Habitat Threatened Floral SCC	O	(-)	Moderate	Low
	Grassland Habitat Protected Floral SCC	O	(-)	Low	Low
	Freshwater ecosystems Threatened Floral SCC	O	(-)	Moderate	Low
	Freshwater ecosystems Protected Floral SCC	O	(-)	Low	Low
	Grassland Habitat Threatened Floral SCC	D	(-)	Moderate	Low
	Grassland Habitat Protected Floral SCC	D	(-)	Low	Very low
Animal Species habitat and diversity	Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity	P	(-)	Moderate	Low
	Grassland Habitat with linear development faunal habitat and diversity	P	(-)	Low	Low
	Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity	P	(-)	Low	Low
	Transformed Habitat with linear development faunal habitat and diversity	P	(-)	Low	Very Low
	Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity	C	(-)	High	Moderate
	Grassland Habitat with linear development faunal habitat and diversity	C	(-)	High	Moderate
	Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity	C	(-)	Low	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Transformed Habitat with linear development faunal habitat and diversity	C	(-)	Low	Low
	Freshwater ecosystems with linear development	C	(-)	Moderate	Low
	Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity	O	(-)	Moderate	Moderate
	Grassland Habitat with linear development faunal habitat and diversity	O	(-)	Moderate	Low
	Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity	O	(-)	Moderate	Low
	Transformed Habitat with linear development faunal habitat and diversity	O	(-)	Moderate	Low
	Freshwater ecosystems with linear development	O	(-)	Moderate	Low
	Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity	D	(-)	Moderate	Low
	Grassland Habitat with linear development faunal habitat and diversity	D	(-)	Moderate	Low
	Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity	D	(-)	Moderate	Low
	Transformed Habitat with linear development faunal habitat and diversity	D	(-)	Moderate	Low
Animal SCC	Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity	P	(-)	Moderate	Low
	Grassland Habitat with linear development faunal habitat and diversity	P	(-)	Moderate	Low
	Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity	P	(-)	Low	Low
	Transformed Habitat with linear development faunal habitat and diversity	P	(-)	Low	Low
	Grassland Habitat with PV facility and associated infrastructure faunal habitat and	C	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	diversity				
	Grassland Habitat with linear development faunal habitat and diversity	C	(-)	Moderate	Low
	Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity	C	(-)	Low	Low
	Transformed Habitat with linear development faunal habitat and diversity	C	(-)	Low	Low
	Freshwater ecosystems with linear development	C	(-)	Moderate	Low
	Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity	O	(-)	Moderate	Low
	Grassland Habitat with linear development faunal habitat and diversity	O	(-)	Low	Low
	Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity	O	(-)	Low	Low
	Transformed Habitat with linear development faunal habitat and diversity	O	(-)	Low	Low
	Freshwater ecosystems with linear development	O	(-)	Low	Low
	Grassland Habitat with PV facility and associated infrastructure faunal habitat and diversity	D	(-)	Moderate	Low
	Grassland Habitat with linear development faunal habitat and diversity	D	(-)	Moderate	Low
	Transformed Habitat with PV facility and associated infrastructure faunal habitat and diversity	D	(-)	Moderate	Low
	Transformed Habitat with linear development faunal habitat and diversity	D	(-)	Moderate	Low
Avifauna	Displacement of priority species	C	(-)	Moderate	Moderate
	Displacement of priority species	C	(-)	High	Moderate
	Mortality of priority species	O	(-)	Low	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Entrapment of large-bodied birds	O	(-)	Low	Low
	Mortality of priority species	O	(-)	Low	Very Low
	Mortality of priority species	O	(-)	Low	Low
	Displacement of priority species	D	(-)	Moderate	Moderate
Archaeological and Cultural Heritage	Possible damage to archaeological resources	C	(-)	High	Very low
Palaeontology	Possible damage to palaeontological resources	C	(-)	Low	Very low
Traffic	Increase in Development Trips	C	(-)	Moderate	Low
	Noise and dust pollution	O	(-)	Low	Very Low
	Increase in Development Trips	D	(-)	Moderate	Low
Visual	Farmsteads within 2 km radius	C	(-)	Moderate	Moderate
	Gravel road	C	(-)	Moderate	Moderate
	All receptors within 5 km radius	C	(-)	Moderate	Moderate
	Tutuka Power Station Airfield	O	(-)	Low	Low
	Farmsteads within 2 km radius	O	(-)	Moderate	Moderate
	Gravel road	O	(-)	Moderate	Moderate
	All receptors within 5 km radius	O	(-)	Low	Low
	Farmsteads within 2 km radius	D	(-)	Moderate	Moderate
	Gravel road	D	(-)	Moderate	Moderate
	All receptors within 5 km radius	D	(-)	Low	Low
Social	Creation of employment and business opportunities	C	(+)	Low	Moderate
	Presence of construction workers in the area on local communities	C	(-)	Moderate	Low
	Influx of job seekers	C	(-)	Low	Low
	Risk to safety, livestock, and damage to farm infrastructure	C	(-)	Low	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Increased risk of grass fires	C	(-)	Moderate	Very Low
	Construction related activities	C	(-)	Moderate	Low
	Loss of farmland	C	(-)	Moderate	Low
	Improving energy security and support renewable sector	O	(+)	Moderate	High
	Creation of employment opportunities	O	(+)	Very Low	Moderate
	Benefits associated with socio-economic development contributions	O	(+)	Moderate	Moderate
	Visual impact and impact on sense of place	O	(-)	Moderate	Moderate
	Impact on property values	O	(-)	Low	Very Low
	Tourism	O	(-)	Very Low	Very Low
	Social impacts associated with decommissioning	D	(-)	Low	Very Low
Geotechnical	Soil erosion	C	(-)	Moderate	Very low
	Oil spillages	C	(-)	Moderate	Very low
	Disturbance of fauna and flora	C	(-)	Low	Very low
	Slope stability	C	(-)	Low	Very low
	Seismic activity	C	(-)	Very Low	Very low
	Soil Erosion	O	(-)	Low	Very low
	Potential Oil Spillages	O	(-)	Moderate	Very low
	Soil erosion	D	(-)	Moderate	Very low
	Oil spillages	D	(-)	Moderate	Very low
	Disturbance of fauna and flora	D	(-)	Low	Very low
	Slope stability	D	(-)	Low	Very low
High Level Safety, Health and Environmental Risk Assessment	Human Health - chronic exposure to toxic chemical or biological agents	C	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Human Health - exposure to noise	C	(-)	Moderate	Low
	Human Health - exposure to temperature extremes and/or humidity	C	(-)	Low	Very Low
	Human Health - exposure to psychological stress	C	(-)	Low	Low
	Human Health - exposure to ergonomic stress	C	(-)	Low	Low
	Human and Equipment Safety - exposure to fire radiation	C	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to explosion over pressures	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to electromagnetic waves	C	(-)	Moderate	Low
	Environment - emissions to air	C	(-)	Low	Very Low
	Environment - emissions to water	C	(-)	Low	Low
	Environment - emissions to earth	C	(-)	Low	Low
	Environment - waste of resources e.g., water, power etc	C	(-)	Low	Very Low
	Public - Aesthetics	C	(-)	Low	Low
	Investors - Financial	C	(-)	Moderate	Low
	Employees and investors - Security	C	(-)	Moderate	Low
	Emergencies	C	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Investors - Legal	C	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	O	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	O	(-)	Moderate	Low
	Human Health - exposure to noise	O	(-)	Moderate	Low
	Human Health - exposure to temperature extremes and/or humidity	O	(-)	Low	Very Low
	Human Health - exposure to psychological stress	O	(-)	Low	Very Low
	Human Health - exposure to ergonomic stress	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to fire radiation	O	(-)	High	Low
	Human and Equipment Safety - exposure to fire radiation	O	(-)	High	Low
	Human and Equipment Safety - exposure to explosion over pressures	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	O	(-)	Low	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to electromagnetic waves	O	(-)	Moderate	Low
	Environment - emissions to air	O	(-)	Low	Very Low
	Environment - emissions to water	O	(-)	Low	Low
	Environment - emissions to earth	O	(-)	Low	Very Low
	Environment - waste of resources e.g., water, power etc	O	(-)	Low	Very Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Public - Aesthetics	O	(-)	Low	Low
	Investors - Financial	O	(-)	Moderate	Low
	Employees and investors - Security	O	(-)	Moderate	Low
	Employees and investors - Security	O	(-)	Moderate	Low
	Emergencies	O	(-)	Moderate	Low
	Investors - Legal	O	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	D	(-)	N/A	N/A
	Human Health - exposure to noise	D	(-)	N/A	N/A
	Human Health - exposure to temperature extremes and/or humidity	D	(-)	N/A	N/A
	Human Health - exposure to psychological stress	D	(-)	N/A	N/A
	Human Health - exposure to ergonomic stress	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to fire radiation	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to explosion over pressures	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to electromagnetic waves	D	(-)	N/A	N/A
	Environment - emissions to air	D	(-)	N/A	N/A
	Environment - emissions to water	D	(-)	N/A	N/A
	Environment - emissions to earth	D	(-)	Moderate	Low
	Environment - waste of resources e.g., water, power etc	D	(-)	N/A	N/A

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Public - Aesthetics	D	(-)	N/A	N/A
	Investors - Financial	D	(-)	N/A	N/A
	Employees and investors - Security	D	(-)	N/A	N/A
	Emergencies	D	(-)	N/A	N/A
	Investors - Legal	D	(-)	Moderate	Low

11.2 SPECIALIST CONCLUSIONS

11.2.1 AGRICULTURAL POTENTIAL

The construction phase will only entail light excavation as part of infrastructure development. The post development scenario will not lead to any significant loss of hydropedological process, however a change in hydrological patterns is anticipated. The project will likely lead to a No-Net Loss of interflow recharge if mitigation measures are carefully implemented. The surface runoff would still be delivered into the wetlands through stormwater management systems, although the pattern, timing and duration of the hydrograph would change to some degree. A change in the Present Ecological State (PES) category is however not deemed likely, provided that all mitigation measures contained in this report and the freshwater ecological report are implemented.

Following the assessment of the study area and the identified potential impacts as the result of the proposed development; the key mitigation and rehabilitation measures **Section 9.1**

It is the opinion of the specialist that this study provides the relevant information required for the Environmental Impact Assessment phase of the project to ensure that appropriate consideration of the agricultural resources in the study area will be made in support of the principles of Integrated Environmental Management (IEM) and sustainable development.

11.2.2 AQUATIC BIODIVERSITY

Scientific Aquatic Services (SAS) was appointed to conduct a freshwater ecosystem assessment as part of the Environmental Authorisation (EA) and Water Use Application (WUA) processes for the proposed Tournée 2 Solar photovoltaic (PV) Park and associated infrastructure, near the Thuthukani Settlement, Mpumalanga Province.

The proposed Tournée 2 Solar PV Facility forms part of the larger Tournée Solar PV Cluster which will include two (2) 150 Megawatts (MW) Solar Energy Facilities (SEFs). The proposed Tournée 2 Solar PV Facility will have a generating capacity of no more than 150 Megawatts (MW) and battery energy storage systems (BESS) of 600 megawatt-hours (MWh).

The site assessment confirmed the presence of a Channelled Valley Bottom (CVB) wetland in the eastern and southern portions of the proposed Tournée 2 Solar PV Facility and a depression wetland in the northern portions of the investigation area. As the depression wetland is exclusively associated with the investigation area, and unlikely to be directly impacted by the proposed Tournée

2 Solar PV Facility, only the CVB wetland was assessed further. The CVB wetland was assessed to be in a largely modified ecological condition and of moderate ecological importance and sensitivity.

Results for the EAP provided Impact Assessment indicates that the construction and operational activities associated with the proposed Tournée 2 Solar PV Facility poses a medium impact significance prior to the implementation of mitigation measures and a very low impact significance post the implementation of mitigation measures. The activities associated with the decommissioning phase pose a very low impact significance pre and post implementation of mitigation measures.

Assuming that strict enforcement of cogent, well-developed mitigation measures takes place, the significance of impacts arising from the proposed solar energy facility are likely to be reduced during the construction and operational phases assuming that a high level of mitigation takes place.

Based on the findings of this study it is the opinion of the freshwater ecologist that the proposed Tournée 2 Solar PV Facility, from a freshwater resource management perspective, be considered for development provided that all mitigation measures as defined in this report are implemented.

11.2.3 TERRESTRIAL BIODIVERSITY

The proposed activities will largely occur within Transformed habitat (approximately 190 ha of the total 505,2 ha); however various components of the Tournée 2 Solar PV Facility will occur within the Grassland Habitat (approximately 92 ha of the total 505,2 ha). The proposed activities will impact on these habitat units to varying degrees.

The greatest impacts to floral and faunal communities and ecology (i.e., habitat, diversity, and SCC) are anticipated from the construction phase of the project, where the direct loss of habitat and species will take place through vegetation clearing activities. The Decommissioning phase can allow for reinstatement of some indigenous vegetation but achieving the pre-development landscape is possible but will require significant effort.

It is the opinion of the ecologists that several aspects of the proposed Tournée 2 Solar PV Facility development (especially the developable areas) will result in moderate-high impacts to the receiving environment. However, with adequate implementation of the suggested mitigation measures and avoiding development within the recommended SCC buffers, the impacts associated with the Tournée 2 Solar PV Facility development can be reduced to acceptable levels, taking into consideration the aim of the Decommissioning phase and subsequent rehabilitation of the Tournée 2 Solar PV Facility development. This study is deemed to provide the relevant information required to implement Integrated Environmental Management (IEM) and to ensure that the best long-term use of the ecological resources in the Tournée 2 Solar PV Facility will be made in support of the principle of sustainable development.

11.2.4 PLANT SPECIES

The Tournée 2 Solar PV Facility is associated with habitat of varying degrees of ecological importance, and each will be impacted to different extents. That is, the floral communities identified for the Tournée 2 Solar PV Facility that will be impacted by the proposed activities include the following:

Transformed Habitat of low sensitivity (within the proposed project footprint).
Grassland Habitat of intermediate sensitivity (within the proposed project footprint).

Freshwater Ecosystems of moderately high sensitivity (will not directly be impacted by the proposed activities).

The proposed activities will largely take place within Transformed Habitat (approximately 190 ha); the remaining developments will occur within the Grassland Habitat (approximately 92 ha). The Grassland Habitat is somewhat modified (e.g., by long term grazing) and as such has a lowered habitat integrity; however, the Grassland Habitat still provides suitable habitat for threatened floral SCC and have several confirmed occurrences of provincially protected floral SCC present. The proposed project activities will directly and indirectly impact on floral habitat and will infringe upon habitat where floral SCC were observed during the site assessments.

A floral monitoring plan must be designed and implemented (by the proponent) during the Operational and Maintenance Phase of the project as well as post-decommissioning and rehabilitation of the project (should the project be approved). The following points aim to guide the design of the monitoring plan, and it must be noted that the monitoring plan must be continually updated and refined for site-specific requirements:

Alien vegetation monitoring should take place across the Tournée 2 Solar PV Facility to identify sites that should be prioritised for AIP control. The clearing and management of AIP priority areas should be monitored for re-emerging alien vegetation. Follow-up work can be undertaken on a three (3) to six (6) monthly basis, depending on the rate of re-growth.

Threatened floral SCC and protected floral SCC that have been relocated (if applicable) must be monitored.

Monitoring of all the natural areas surrounding the project's activities should continue throughout the operational and maintenance phase to ensure these areas are not adversely affected by the proposed project activities, especially with regards to edge effect impacts that can stem from AIP proliferation or from a fragmented landscape.

The method of monitoring must be designed to be subjective and repeatable to ensure consistent results.

The significance of biodiversity impacts varied depending on the floral habitat and proposed activities; however, with mitigation measures effectively implemented, the impacts on floral habitat, diversity, protected flora, and threatened flora can be acceptably reduced. Prior to construction, once the approved EMPr and layout is received, a floral walkdown of the finalised footprint is required to obtain exact numbers and localities of floral SCC and protected species that will be impacted.

It is the opinion of the ecologists that this study provides the relevant information required to implement Integrated Environmental Management (IEM) and to ensure that the best long-term use of the ecological resources in the Tournée 2 Solar PV Facility will be made in support of the principle of sustainable development.

11.2.5 ANIMAL SPECIES

The Tournée 2 Solar PV Facility comprised of three habitat units, namely the Grassland habitat Transformed habitat and Freshwater Ecosystem habitat. The Grassland habitat provides habitat and food resources for the majority of faunal species and SCC observed on site. The Freshwater Ecosystem habitat supports several common faunal species, one mammal SCC was observed, and is used as an additional throughfare / movement corridor connecting areas in and outside of the Tournée 2 Solar PV Park. In terms of sensitivities Grassland habitat is of intermediate sensitivity, Transformed habitat is of low sensitivity and the Freshwater Ecosystem habitat is of high sensitivity.

During the site assessment, a single SCC was observed within the Tournée 2 Solar PV Facility footprint, namely Aonyx capensis (Cape Clawless Otter). In addition to this species, several other SCC have a medium POC within the proposed Tournée 2 Solar PV Facility footprint area. Impacts stemming from the construction of the proposed Tournée 2 Solar PV Facility will vary from high to low impacts on faunal biodiversity. Through the implementation of mitigation measures as stipulated in this report, along with sound environmental management, impacts can be reduced.

Although the proposed development will likely impact on faunal species as a result of habitat loss, the habitats within the proposed Tournée 2 Solar PV Facility is not deemed to be of increased sensitivity for fauna, nor does it contain niche / unique habitat types or features that support range restricted SCC. From an IFC perspective the habitat on site cannot be defined as critical habitat except for the Freshwater Ecosystem habitat which has been avoided as part of the proposed development. Although several SCC faunal species are likely to occur within (permanently or temporarily) the proposed Tournée 2 Solar PV Park, they are equally likely to be found in the same abundance in the surrounding natural areas. From a faunal ecological perspective, provided that all mitigation measures are implemented and that sound environmental management takes place, the proposed Tournée 2 Solar PV Facility are not expected to pose a significant threat to faunal populations in the region. As such, it is the opinion of the specialists that there is no clear reason why this development should not be authorised.

11.2.6 AVIFAUNA

Large sections of the PAOI have already been transformed and consists of agricultural land, used for crops and cattle grazing, with the most sensitive areas for birds identified as the wetlands and farm dams. These damp areas serve as potential roosting areas for Black Harrier, African Marsh Harrier, Montagu's Harrier, Pallid Harrier, and Blue Crane. They are also likely to attract large raptors, storks and bustards which may use these to both bath and drink. Blue Cranes regularly enter farm dams to protect their chicks from terrestrial predators in the evenings.

The more natural grasslands on the PAOI seemed to hold a greater number of priority species such as Blue Korhaan, Secretarybird, and although these species would all be affected by the permanent removal of these grasslands for the construction of the proposed SEF, the surrounding grasslands neighbouring the PAOI should be sufficient to allow for the feeding and breeding of these species.

Currently, with only thirty percent of the potential Priority Species being recorded on both the Tournée 1 Solar PV and Tournée 2 Solar PV facilities, the overall impact on birds based off the seasonal surveys is considered LOW, and we have identified no fatal flaws and all likely risks can be mitigated.

11.2.7 HERITAGE

The significant heritage resources identified in the study area relate to the historic farm occupation of the property. These resources include the remnants of an old farm werf as well as burial sites that were identified. In order to ensure that no impact to the identified resources occurs during the construction or operational phases of the development, a number of recommendations are made below.

Based on the fossil record but confirmed by the site visit and walk through there are NO FOSSILS of any significance such as those of recognisable Glossopteris floral elements, even though fossils have been recorded from rocks of a similar age and type in South Africa. It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur below the ground surface in the shales of the Vryheid Formation so a Fossil Chance Find Protocol must be implemented for the duration of excavation activities.

There is no objection to the proposed development from an archaeological perspective on condition that:

- The recommendations in the VIA must be implemented.
- A no development buffer of 50m is implemented around the burial sites identified within the development area.
- Ongoing community access to these burials, as well as their conservation into the future, must be ensured.
- This can be managed through the development of a Heritage Management Plan for the burials to be implemented for the duration of the project.
- The Chance Fossil Finds Procedure must be implemented for the duration of construction activities.
- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.

11.2.8 PALAEONTOLOGY

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- The Chance Fossil Finds Procedure must be implemented for the duration of construction activities.
- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.

11.2.9 TRAFFIC

The potential traffic and transport related impacts for the construction, operation and decommissioning phases of the proposed Tournée 2 Solar PV Facility were identified and assessed.

The main impact on the external road network will be during the construction phase. This phase is temporary in comparison to the operational period. The number of abnormal loads vehicles was estimated and to be found to be able to be accommodated by the road network.

During operation, it is expected that maintenance and security staff will periodically visit the facility and water be transported to site possibly twice a year for the cleaning of panels. The generated trips can be accommodated by the external road network and the impacts are rated negative very low post-mitigation.

The traffic generated during the construction phase, although significant, will be temporary and impacts are considered to be of negative low impact after mitigation.

The traffic generated during the decommissioning phase will be similar to or even less than the construction phase traffic and the impact on the surrounding road network will also be considered to be of negative low impact after mitigation.

For the cumulative impact, it was assumed that all listed developments in a radius of 30 km from the site will be developed at the same time (which will in reality be unlikely). After mitigation, a rating of a negative low impact is given.

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

- Dust suppression of internal gravel roads and the access roads.
- Component delivery to/ removal from the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network, if available and feasible.
- Staff and general trips should occur outside of peak traffic periods.
- A “dry run” of the preferred route. Should the haulage company be familiar with the route, evidence is to be provided to the Client and the Contractor.
- Design and maintenance of the internal gravel roads and maintenance of the access roads.
- If required, any low hanging overhead lines (lower than 5.1m) e.g., Eskom and Telkom lines, along the proposed routes will have to be moved (to be arranged by haulage company) or raised to accommodate the abnormal load vehicles.

The construction and decommissioning phases of a solar power facility are the only significant traffic generators and therefore noise and dust pollution will be higher during these phases. The duration of these phases is of temporary nature, i.e., the impact of the solar power facility on the external traffic on the surrounding road network is temporary and solar facilities, when operational, do not add any significant traffic to the road network.

From a transport engineering perspective, the proposed development alternatives (i.e., electrical infrastructure compound location alternatives and the technology options for the BESS) are acceptable as they do not have any impact on the traffic on the surrounding road network and as such the project is supported from a transport engineering perspective.

11.2.10 VISUAL

The proposed Tournée 2 Solar PV Facility is situated in a rural area with a relatively low number of sensitive receptors comprising mostly of farmsteads. Based on the field assessment, the undulating topography and dense vegetation associated with the farmsteads partially obscures the view towards the Tournée 2 Solar PV Facility, therefore the visual impact for the Tournée 2 Solar PV Facility is considered moderately low as the visual intrusion on the receiving environment will be low to moderate depending on the location of the vantage point.

According to the Strategic Environmental Assessment (SEA) Project (2019) the Tournée 2 Solar PV Facility does not fall within any Renewable Energy Development Zones (REDZ) nor within any corridor for Electrical Grid Infrastructure (EGI). According to South African Renewable Energy EIA Application Database (REEA) there is one approved application for a renewable energy facility (solar) within a 30 km radius of the Tournée 2 Solar PV Facility. This indicates that the larger region may be earmarked for renewable energy facilities in the foreseeable future, which may alter the landscape character on a broader scale. With the Tournée 2 Solar PV Facility and surroundings being dominated by grasses interspersed with freshwater ecosystems and cultivated fields, the vegetative component will not be able to substantially assist in screening the Tournée 2 Solar PV Facility. The farmsteads do however have existing dense tree lines which may partially or completely obscure the view towards Tournée 2 Solar PV Facility. The local topography of the Tournée 2 Solar PV Facility is relatively flat to gently sloping with the surrounding landscape displaying undulating terrain. With the local topography of the Tournée 2 Solar Facility being relatively flat, it is unlikely to assist in absorbing and/ or screening the Tournée 2 Solar PV Facility. The field assessment did however indicate the undulating terrain of the surrounding area affecting the degree of visibility from various vantage points. The Tutuka ash dump will assist in screening and/ or absorbing the Tournée 2 Solar PV Facility, especially to receptors located to the south and north.

The sense of place associated with the Tournée 2 Solar PV Facility can be described as calm, tranquil and peaceful, with limited development and movement, with the exception of the shepherds moving with the livestock and the cultivated fields being tilled or harvested. The sense of place is however not unique to the Tournée 2 Solar PV Facility as it extends to the larger region. During the construction phase of the Tournée 2 Solar PV Facility, the sense of place will however be affected, shifting the mood to busy and disturbed with construction vehicles and potential need for some earth moving equipment, however, once the panels are operational there will be limited additional vehicular movement in and out of the area, thus returning the area to a calm and tranquil landscape.

The Tournée 2 Solar PV Facility being located in a rural area, results in limited sources of night-time lighting, as such the lighting environment is considered rural with low district brightness.

Development of the Tournée 2 Solar PV Facility may potentially be a source of light pollution during the construction and operational phases, due to security lighting on the perimeter fence and at the buildings (substation, BESS and O&M Buildings). Overall, the impact significance of potential night-time lighting is expected to be moderately low and will be limited to a local area, as the Tournée 2 Solar PV Facility is not a development that requires a significant amount of lighting. This corresponds with Bortle's Scale – indicating that Tournée 2 Solar PV Facility falls within a Class 4 area (rural/suburban transition) where the light pollution is low and distant large objects are distinct. As such the introduction of lighting sources in a rural area result in the Tournée 2 Solar PV Facility likely to somewhat contribute to the effects of sky glow and artificial lighting in the region.

From a visual resource aspect, there are no fatal flaws associated with the Tournée 2 Solar PV Facility. Hence, it is the professional opinion of the visual specialist that he development of the Tournée 2 Solar PV Facility can be considered for authorisation.

11.2.11 SOCIAL

The findings of the SIA indicate that the proposed Tournée 2 PV Facility and associated infrastructure will result in several social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. The project will also contribute to local economic development though socio-economic development (SED) contributions. In addition, the development will improve energy security and reduce the carbon footprint associated with energy generation. The findings of the SIA also indicate that the potential negative impacts associated with both the construction and operational phase are likely to be Low Negative with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented.

The establishment of the proposed Tournée 2 PV Facility is supported by the findings of the SIA.

11.2.12 DESKTOP GEOTECHNICAL

The completed desktop assessment of the geotechnical conditions at the proposed development site for Tournée 2 Facility has shown the site to be generally suitable for the proposed development. A “negative very low to moderate” impact was assessed, from a geotechnical perspective, for the pre-mitigation situation. Post-mitigation, the assessed impact decreases significantly to “negative very low”. A geotechnical site investigation must be undertaken to provide detailed geotechnical information for the design of the proposed structures and roads.

The proposed development should, from a geotechnical impact perspective, be authorized. The most significant geotechnical condition that will affect the development is the possibility of hard excavation conditions if shallow rock is present.

Minimal slope stability issues are expected as slope areas are minimal. Access roads can be developed as gravel roads with suitable wearing-course to protect the subgrade likely being obtained from local weathered dolerite deposits.

A detailed intrusive site investigation is recommended to further characterize site conditions, to better understand the key geotechnical risks characteristics and optimise the design of the Solar PV plant.

Based on the current lack of previous geotechnical investigation data, the primary objectives of the proposed intrusive investigation must include:

- Determination of the founding conditions for all structures. The scope of the intrusive investigation should comprise test pitting, the drilling of a representative number of boreholes and laboratory testing.
- Investigation of subgrade conditions for service roads.
- Investigation of materials to be used during construction.
- Non-intrusive investigation techniques, such as geophysical (seismic refraction) surveys, thermal and electrical resistivity for ground earthing requirement.

11.2.13 HIGH LEVEL SAFETY, HEALTH AND ENVIRONMENT RISK ASSESSMENT

General

The RA has found that with suitable preventative and mitigation measures in place, none of the identified potential risks are excessively high, i.e., from a SHE perspective no fatal flaws were found with the BESS installation at the proposed Tournée PV Facility near Murraysburg.

At a large facility, without installation of the state-of-the art battery technology that includes protective features, there can be significant risks to employees and first responders. The latest battery designs include many preventative and mitigation measures to reduce these risks to tolerable levels. State-of-the-art technology should be used, i.e., not old technology that may have been prone to fire and explosion risks.

The design should be subject to a full HAZOP prior to commencement of procurement. A HAZOP is a detailed technical systematic study that looks at the intricacies of the design, the control system, the emergency system etc. and how these may fail under abnormal operating conditions. Additional safeguards may be suggested by the team doing the study.

Lithium Solid State Containerized Batteries

With lithium solid-state batteries, the most significant hazard with battery units is the possibility of thermal runaway and the generation of toxic and flammable gases. There have been numerous such incidents around the world with batteries at all scales and modern technology providers include many preventative and mitigation features in their designs. This type of event also generates heat which may possibly propagate the thermal runaway event to neighbouring batteries if suitable state of the art technology is not employed.

The flammable gases generated may ignite leading to a fire which accelerates the runaway process and may spread the fire to other parts of the BESS or other equipment located near-by.

If the flammable gases accumulate within the container before they ignite, they may eventually ignite with explosive force. This type of event is unusual but has happened with an older technology container installed at McMicken in the USA in 2019.

Due to a variety of causes, thermal runaway could happen at any point during transport to the facility, during construction or operation / maintenance at the facility or during decommissioning and safe making for disposal.

Due to the containerized approach as well as the usual good practice of separation between containers, which should be applied on this project, and therefore the likely restriction of events to one container at a time, the main risks are close to the containers i.e., to transport drivers, employees at the facilities and first responders to incidents.

In terms of a worst conceivable case container fires, the significant impact zone is likely to be limited to within 10m of the container and mild impacts to 20m. Based on the current proposed layouts, impacts at the closest isolated farmhouses are not expected.

In terms of a worst conceivable case explosion, the significant impact zone is likely to be limited to with 10m of the container and minor impacts such as debris within 50m. Based on the current proposed layouts, impacts at the closest isolated farmhouses are not expected.

In terms of a worst reasonably conceivable toxic smoke scenario, provided the units are placed suitably far apart to prevent propagation from one unit to another and large external fires are prevented, the amount of material burning should be limited to one container at any one time. In this case, beyond the immediate vicinity of the fire, the concentrations of harmful gases within the smoke should be low. The proposed BESS installation's location is well over 500m from any occupied farmhouse, industrial or commercial activity and therefore the risks posed by the BESS are negligible.

Recommendations

The following recommendations have been made:

- There are numerous different battery technologies but using one consistent battery technology system for the proposed Tournée PV BESS installations in the area would allow for ease of training, maintenance, emergency response and could significantly reduce risks.
- Where reasonably practicable, state-of-the-art battery technology should be used with all the necessary protective features e.g., draining of cells during shutdown and standby-mode, full BMS with deviation monitoring and trips, leak detection systems.
- TournéeSection 9 of the EIA report contains technical and systems recommendations for managing and reducing risks. Ensure the items listed in these tables under preventative and mitigation measures are included in the design.
- The overall design should be subject to a full HAZOP prior to finalization of the design.
- Prior to bringing any solid-state battery containers into the country, the contractor should ensure that:
  - An Emergency Response Plan is in place that would be applicable for the full route from the ship to the site. This plan would include details of the most appropriate emergency response to fires both while the units are in transit and once they are installed and operating.
  - An End-of-Life plan is in place for the handling, repurposing or disposal of dysfunctional, severely damaged batteries, modules and containers.
- The site layout and spacing between lithium solid-state containers should be such that it mitigates the risk of a fire or explosion event spreading from one container to another.
- Under certain weather conditions, the noxious smoke from a fire in a lithium battery container could travel some distance from the unit. The smoke will most likely be acrid and could cause irritation, coughing, distress etc. Close to the source of the smoke, the concentration of toxic gases may be high enough to cause irreversible harmful effects. The BESS needs to be located at a suitable distance from public facilities/residences etc. The proposed BESS must be located more than 500m from isolated farmhouses. None of the dwellings/industrial or commercial activities in the area is within 500m of the proposed BESS location and therefor ethe location is suitable.
- Where there is a choice of alternative locations for the BESS, those that are further from water courses would be preferred. Solid-state systems may experience fires that may result in loss of containment of liquids or the use of large amounts of fire water which could be contaminated. The size of the buffer between water bodies and the BESS containing chemicals should be set in consultation with a water specialist and is therefore not specified in this SHE RA.
- Finally, it is suggested once the exact battery technology has been chosen and more details of the actual design are available, the necessary updated Risk Assessments should be in place.

11.3 ALTERNATIVES ASSESSMENT

Project alternatives in terms of activity, technology, location and layout were considered as part of this EIAR process. The revised layout avoids sensitivities as much as possible.

Table 11-2 outlines the preferred alternatives considered feasible and preferred from an environmental perspective (that is, as per the input from the Specialists).

Table 11-2 – Preferred Site Alternatives

Alternative	Preferred	Comment
Technology – Solar	The Tournée 2 Solar PV Facility will utilise solar PV technology to generate power. Therefore, no other technology alternatives were considered for this project.	Motivation for the use of solar PV technology includes: ▪ Availability of solar resource in the Mpumalanga region; and ▪ PV technology is more competitive from a cost perspective.
Technology – BESS	The Tournée 2 Solar PV Facility will utilise Lithium-Ion batteries or similar solid-state technology for the BESS. No other BESS technology was considered by the developer as from an environmental and design perspective it was the most favourable	Motivation for the use of Lithium-Ion batteries or similar solid-state technology for the BESS includes: ▪ This technology is mature and safe technology with regard to potential impacts on the environment in a solar facility farm; and ▪ They work well as energy storage systems for solar facilities. The design of the cells are completely sealed in the factories when they are manufactured, and no electrolytic liquids are thus handled on site.
Location Alternatives	There is no site alternative for the Tournée 2 Solar PV Facility. The location of the proposed project is based on the site awarded to the applicant in response to an Eskom RFP. The investigation of an alternative site is not currently proposed within this S&EIA Tournée 2 Solar PV Facility area is located on Remaining Portion of Portion 3 of Farm Dwars-in-die-Weg 350 IS and Portion 6 of Farm Dwars-in-die-Weg 350 IS	The Tournée 2 Solar PV Facility was selected because it meets the requirements outlined by the Eskom RfP, which includes: ▪ The selected location must be in close proximity to the existing Eskom infrastructure and interconnection points including substations; ▪ The site must be suitable open land for Solar PV development; ▪ The screening process for the selected location must not identify exceedances of environmental sensitivities; and ▪ The selected site must contribute to the JET

Alternative	Preferred	Comment
		Programme.
Layout Alternatives	The location of the project infrastructure (i.e., layout) was determined based on initial environmental and technical screening which considered the infrastructure locations feasible from a constructability perspective. This included several key aspects including environmental constraints and opportunities, distance to grid connection, topography, site accessibility. The conceptual layout was taken forward for assessment by the various Specialists during this EIA Phase. The project layout has been optimised based on specialist sensitivities and therefore the current layout is considered most suitable.	The conceptual layout was optimised based on the following: ▪ Repositioning of the internal road crossing to avoid bisecting the CVB wetland; ▪ Repositioning of the powerline to ensure that the pylons will be located outside of the wetlands; and ▪ Repositioning of the BESS so it is further away from the office/workshop area. The optimised and finalised layout is included in **Figure 11-1**.

11.3.1 NO-GO ALTERNATIVE

In the “no project” alternative, the proposed project will not be developed. In this scenario, there could be a missed opportunity to address the need for increase in renewable energy generation in an effort to mitigate against concerns of climate change and exploitation of non-renewable resources. The no-go alternative would not assist in responding to the growing electricity demand in South Africa and would not contribute to the reliability of electricity supply at a national scale. Conversely, negative environmental impacts of the project (as outlined in Section 9) associated with the development of the Tournée 2 Solar PV Facility would be avoided, and the current status quo will continue. This includes continued use of the land for agriculture.

Specialists have considered the no-go alternative and the following has been concluded:

- Traffic:
  - The no-go alternative implies that the proposed Tournée 2 Solar PV Facility as well as the associated infrastructure do not proceed. This would mean that there will be no negative environmental impacts and no traffic impact on the surrounding network during the construction and decommissioning phases. However, this would also mean that there would be no socio-economic benefits to the surrounding communities, and it will not assist government in meeting its targets for renewable energy. Hence, the no-go alternative is not a preferred alternative.
- Social:
  - The aim of the project is to produce renewable energy for the mining and industrial sector in the area. This will assist to reduce South Africa’s carbon footprint. South Africa relies on coal-

powered energy to meet more than 90% of its energy needs. South Africa is therefore one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions.

- The No-Development option would represent a lost opportunity for South Africa to produce renewable energy and reduce its carbon footprint. This would represent a significant negative social cost.

11.4 FINALISED LAYOUT

The final layout is provided in **Figure 11-1**. The sensitivities provided by the specialists have been overlaid on the layout map and is indicated in **Figure 11-2**.

Legislated "no go" areas or setbacks are areas or features that are considered of such significance that impacting them may be regarded as fatal flaw or strongly influence the project impact significance profile. Therefore areas or features that are considered to have a high sensitivity or where project infrastructure would be highly constrained and should be avoided as far as possible are referred to as "no-go" areas. Infrastructure located in these areas are likely to drive up impact significance ratings and mitigations. The assumption is that the overhead lines could span these areas, but the towers/pylons should adhere to the buffer distances as indicated as far as possible where areas are too large to span (buffers) then these tower positions must be evaluated on a case by case basis prior to construction. A "no-go" map has been included in **Figure 11-3**.

This map includes a 30 m visual buffer specifically for solar panels to mitigate the glint and glare impact to road users. The solar panels are to be constructed outside of the visual buffer. All other ancillary infrastructure including roads, overhead powerlines and cabling will be allowed in this area.

It is recommended that the final layout for the Tournée 2 Solar PV Facility is approved.

Figure 11-1 – Tournée 2 Solar PV Facility Final Layout

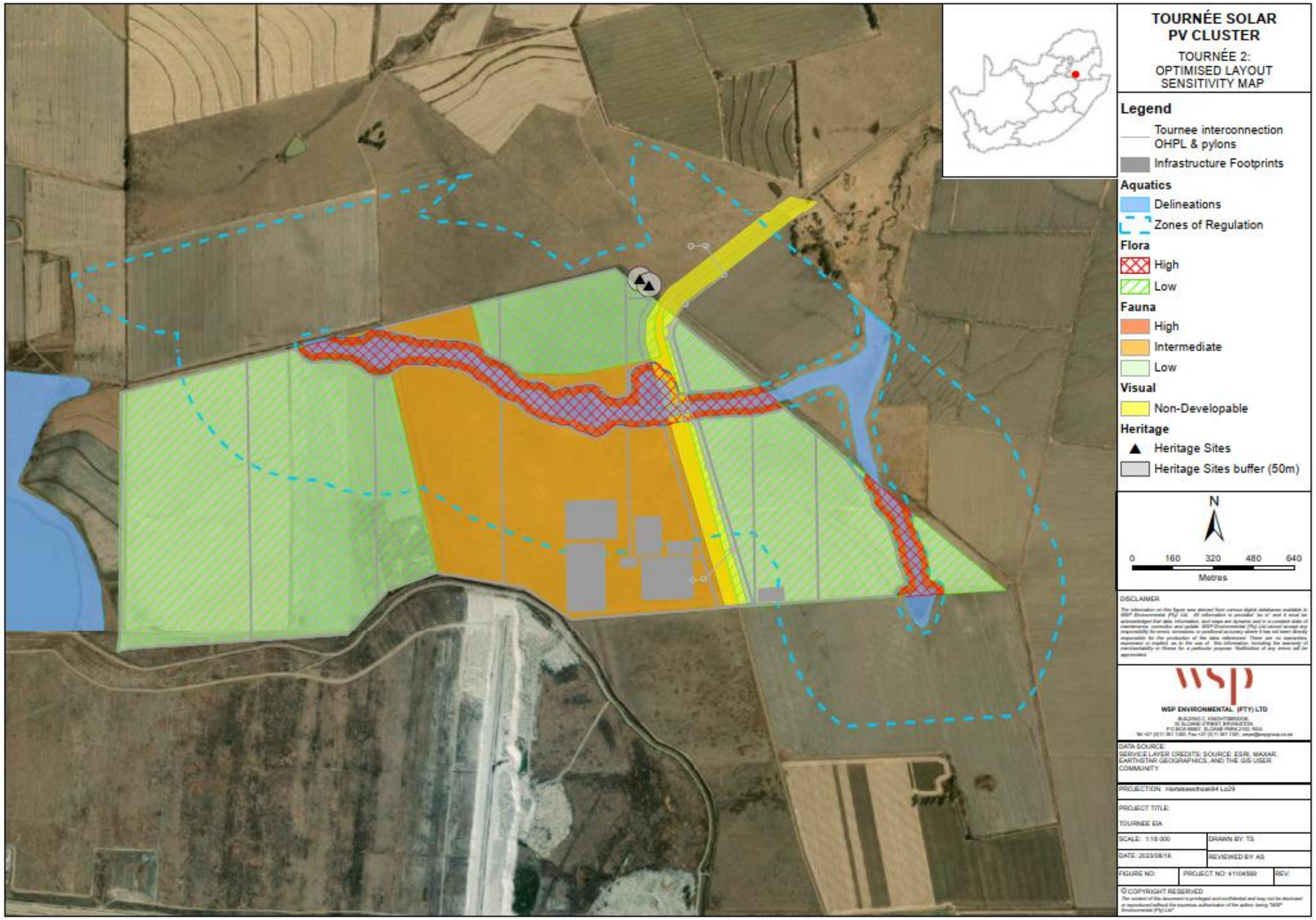

Figure 11-2 – Tournée 2 Solar PV Facility Final Layout Sensitivity Map

Figure 11-3 – Tournée 2 Solar PV Facility Final Layout No-Go Map

11.5 RECOMMENDED CONDITIONS OF AUTHORISATION

The layout presented in this report for the Tournée 2 Solar PV Facility is final and no additional site visits are required. All proposed infrastructure have been buffered and no further design buffers or changes are required.

The Final Layout and EMPr should be approved such that the following can be implemented:

- **The EMPr and EIA mitigation measures must be adhered to;**
- **Recommendations for the layout as provided by the relevant specialists must be implemented;**
- **The final EMPr must form part of all contractual documents with contractors during construction and operational phases of the project. Furthermore, an Environmental Site Compliance Officer (ESCO) must be appointed to ensure compliance to all EA conditions and EMPr commitments throughout the construction phase; and**
- **Where required, water use authorisation under NWA is to be obtained from the Department of Water and Sanitation prior to construction.**

The following key aspects are recommended to be included as conditions of authorisation:

- The project layout must avoid all the no-go areas identified by the specialists.

Specialist recommendations that have been made in respect of the project and have been included in the EMPr (**Appendix I**):

11.6 EA AUTHORISATION PERIOD

Appendix 1(3)(1)(q) of the NEMA EIA Regulations 2014, as amended requires "where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised" must be included in the EIA Report.

The EA is required to be valid for a period of 10 years from the date of issuance of the EA. This is considered a reasonable period to allow the Applicant time to conduct relevant internal processes which can only begin after issuance of the EA.

12 IMPACT STATEMENT

The overall objective of the S&EIA Process is to provide sufficient information to enable informed decision-making by the authorities. This was undertaken through consideration of the proposed Project components, identification of the aspects and sources of potential impacts and subsequent provision of mitigation measures.

It is the opinion of WSP that the information contained in this document (read in conjunction the EMPr) is sufficient for DFFE to make an informed decision for the environmental authorisation being applied for in respect of this Project.

Mitigation measures have been developed, where applicable, for the above aspects and are presented within the site specific and generic EMPrs (**Appendix I**). It is imperative that all impact mitigation recommendations contained in the EMPr, of which the environmental impact assessment took cognisance, are legally enforced.

Considering the findings of the respective studies, no fatal flaws were identified for the proposed Project. Should the avoidance and mitigation measures prescribed be implemented, the significance of the considered impacts for all negative aspects pertaining to the environmental aspects is expected to be acceptable. It is thus the opinion of the EAP that the Project can proceed, and that all the prescribed mitigation measures and recommendations are considered by the issuing authority.

WAY FORWARD

Tournée 2 Solar (Pty) Ltd is proposing the development of the 150 MW Tournée 2 Solar PV Facility located near Standerton in the Mpumalanga Province. This report provides a description of the proposed Project and details the aspects associated with the construction and operation. The report also includes the methodology followed to undertake the S&EIA process. A detailed description on the existing environment (biophysical as well as socio-economic) is provided based on findings from the specialist surveys and existing information. Stakeholder engagement undertaken from the onset of the assessment to date, has been conducted in a transparent and comprehensive manner.

This draft EIAR is available for public review from **18 August 2023 to 18 September 2023**.

All issues and comments submitted to WSP during the scoping phase have been incorporated in the SER (**Appendix D**). The Final EIR will be submitted to the DFFE, as the competent authority, following the public review and addressing of comments, where necessary.

If you have any further enquiries, please feel free to contact:

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