Prepared for:
ABO Wind Renewable Energies (Pty) Ltd

Scoping and Environmental Impact Assessment (EIA) Process
for the
PROPOSED DEVELOPMENT OF A SOLAR PHOTOVOLTAIC (PV) FACILITY (KUDU SOLAR FACILITY 6) AND ASSOCIATED INFRASTRUCTURE, NEAR DE AAR, NORTHERN CAPE PROVINCE

JULY 2023

FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Prepared by:
Council for Scientific and Industrial Research (CSIR)

Touching lives through innovation

PART A:
MAIN REPORT

CSIR
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SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT

for the

Proposed Development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 6) and associated infrastructure, near De Aar, Northern Cape Province

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

July 2023

Prepared for:
ABO Wind renewable energies (Pty) Ltd

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Council for Scientific and Industrial Research (CSIR)

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Magdel van der Merwe (DTP Solutions)

Title:	Scoping and Environmental Impact Assessment (EIA) Process for the proposed development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 6) and associated infrastructure, near De Aar in the Northern Cape Province: FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT	
Purpose of this report:	The purpose of this EIA Report is to: ▪ Present the details of and the need for the proposed project; ▪ Describe the affected environment at a sufficient level of detail based on specialist input to facilitate informed decision-making; ▪ Provide an overview of the EIA Process that has been followed, including public consultation; ▪ Provide an overview of the potential positive and negative impacts of the proposed project on the environment; ▪ Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project; and ▪ Provide an Environmental Management Programme (EMPr) for the relevant phases of the project. The Draft EIA Report was released to all Interested and/or Affected Parties (I&APs), Organs of State and relevant stakeholders for a 30-day review period extending from **2 June 2023 to 3 July 2023**, excluding public holidays. All comments submitted during the 30-day review period have been incorporated in the Comments and Responses Report, and addressed, as applicable and where relevant, and included as an appendix in this Final EIA Report. This Final EIA Report has been submitted to the National Department of Forestry, Fisheries and the Environment (DFFE) for decision-making.	
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Date:	July 2023	
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PART B: APPENDICES

Key Changes made from the DRAFT EIA Report that was issued for I&AP, Stakeholder and Organ of State Review from 2 June 2023 to 3 July 2023

	Change made – Yes (denoted by ✓) or N/A (denoted by ■)																														
	Chapters																				Appendices										
Key change description	**Summary**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
The term “Draft EIA Report” has been updated to “Final EIA Report”, where applicable	✓	✓	✓	✓	✓	✓	■	■	■	■	■	■	■	■	■	■	■	■	■	■	✓	■	■	■	■	■	■	■	✓	✓	✓	■
Additional details on the applicability of relevant listed activities and project description details, where possible	■	■	■	■	✓	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Updated with additional information regarding the status and progress made on the EIA Process, the submission of the Amended Application for EA to the DFFE, as well as DFFE’s acknowledgment of receipt.	✓	✓	■	■	✓	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	✓	■	■	■	■	✓	■
Updated with details of the Public Participation Process undertaken thus far. Added proof of placement of the newspaper advertisements, correspondence and proof of correspondence sent to stakeholders for the Draft EIA Report release; proof of submission of the Draft EIA Report and Application Form to the DFFE; comments received from stakeholders during the 30-day review of the Draft EIA Report; and Comments and Responses Trail (Specifically Appendix H.3 to H.7).	✓	✓	■	■	✓	✓	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	✓	■	■	✓	■	✓	■
Updated the database of I&APs, Stakeholders and Organs of State to reflect stages of consultation, commenting, as well as additions to the database.	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	✓	■	■	■	■	■	■
Updated the EMPr with recommendations provided by Stakeholders, where relevant	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	✓	✓	■
Project specific feedback on sensitivities added in Chapter 20, Table 20.1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	✓	■	■	■	■	■	■	■	■	■	■	■
Summary feedback on the comments raised during the 30-day review period on the Draft EIA Report in relation to specific specialist assessments	■	■	■	■	■	■	✓	✓	✓	■	✓	■	■	✓	■	■	✓	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Note from the CSIR: If sections are not mentioned in the above table, this means that either there have been no changes or no major changes to these sections.

EXECUTIVE SUMMARY

INTRODUCTION AND PROJECT LOCALITY

The Project Developer, Kudu Solar Facility 6 (Pty) Ltd (hereafter "Project Applicant" or "Project Developer") is proposing to develop a Solar Photovoltaic (PV) power generation facility and associated Electrical Grid Infrastructure (EGI), north-east of the town of De Aar in the Renosterberg Local Municipality and Pixley Ka Seme District Municipality, in the Northern Cape Province. The proposed projects are located approximately 50 km from De Aar and 25 km from Petrusville. A total of 12 Solar PV Facilities are being proposed. Each project will have a specific Project Applicant. The proposed projects are referred to as the "Kudu project". A locality map is provided in Figure A.

ABO Wind renewable energies (Pty) Ltd (hereafter "ABO Wind") is involved in the development proposal stage, however the responsibility for the actual implementation of the project (should Environmental Authorisation (EA) and relevant approvals be granted) lies with the Project Developer / Project Applicant (i.e., Kudu Solar Facility 6 (Pty) Ltd)).

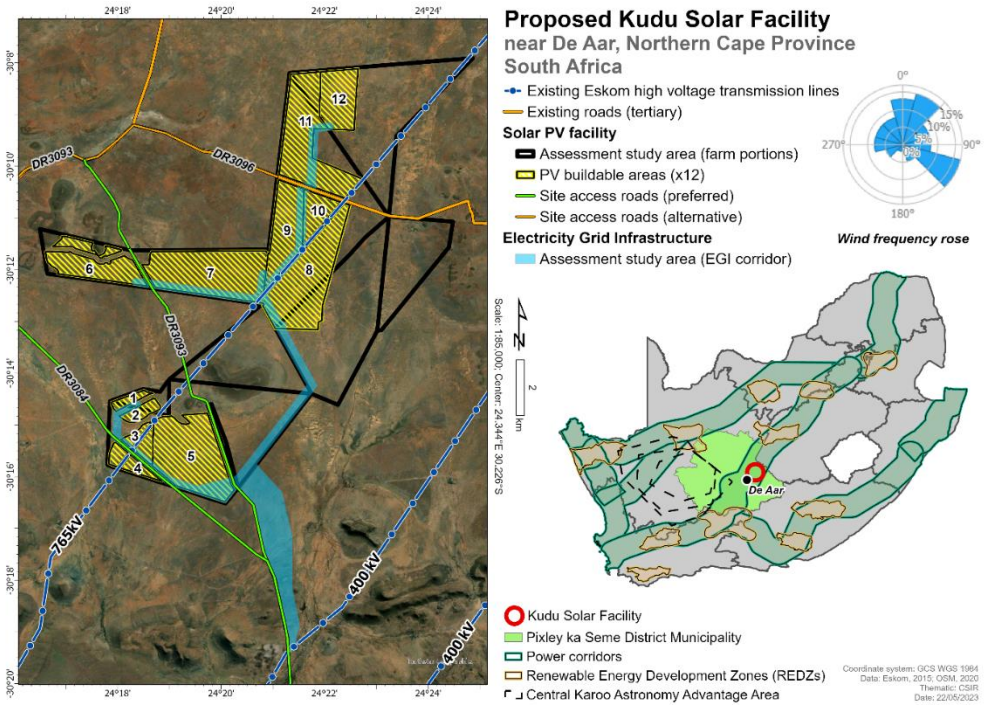

Figure A. Locality Map of the proposed Kudu Projects. Note that the EGI Projects are not part of the current application and report. The EGI Projects will be considered separately at a later stage. The EGI corridor indicated in this Figure is indicative.

The proposed Solar PV Facilities will make use of PV solar technology to generate electricity from energy derived from the sun. Each solar PV Facility will have a range of associated infrastructure, including, but not limited to, an on-site substation complex, Battery Energy Storage System (BESS), and is proposed to connect to the existing Hydra-Perseus 400 kV overhead power line via dedicated proposed 132 kV power lines, an independent Main Transmission Substation (MTS), and a 400 kV Loop-In-Loop-Out (LILO).

Each of the Solar PV Facilities would be its own project and would require its own, separate EA. The same applies to the EGI projects. The following projects are being proposed (illustrated in Figure B):

- **PROJECTS 1 TO 12**: The proposed development of 12 Solar PV Facilities and associated infrastructure (i.e. Kudu Solar Facility 1 to Kudu Solar Facility 12[1]).
- **PROJECTS 13 TO 24**: The proposed development of switching stations and collector stations at each on-site substation complex at each of the 12 Kudu Solar Facilities, and up to 12 x 132 kV overhead power lines running from each Solar PV Facility to the proposed collector stations or up to the proposed MTS.
- **PROJECT 25**: The proposed development of an independent 400/132 kV MTS, including associated infrastructure at the MTS.
- **PROJECT 26**: The proposed development of a 400 kV LILO from the existing Hydra-Perseus 400 kV overhead power line to the proposed MTS.

Scoping and EIA Processes x 12		BA Processes x 12 or Standard Registration Processes x 12 or hybrid approach		
Project 1: Kudu Solar Facility 1	Project 7: Kudu Solar Facility 7	Project 13: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 1	Project 19: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 7	Project 25: Independent 400/132 kV MTS and associated infrastructure
Project 2: Kudu Solar Facility 2	Project 8: Kudu Solar Facility 8	Project 14: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 2	Project 20: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 8	Project 26: 400 kV Loop-In-Loop-Out (LILO) from the existing Hydra-Perseus 400 kV line to the proposed MTS
Project 3: Kudu Solar Facility 3	Project 9: Kudu Solar Facility 9	Project 15: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 3	Project 21: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 9	
Project 4: Kudu Solar Facility 4	Project 10: Kudu Solar Facility 10	Project 16: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 4	Project 22: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 10	
Project 5: Kudu Solar Facility 5	Project 11: Kudu Solar Facility 11	Project 17: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 5	Project 23: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 11	
Project 6: Kudu Solar Facility 6	Project 12: Kudu Solar Facility 12	Project 18: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 6	Project 24: Switching Station, Collector Station, 132 kV Power Line for Kudu Solar 12	

Figure B: Breakdown of the projects that comprise the Kudu Solar Facilities and EGI cluster.

[1] Note that throughout the report the term Solar Facility and PV are used synonymously. For example, Kudu Solar Facility 1 and Kudu PV1 are used interchangeably.

Projects 1 to 12 require Scoping and Environmental Impact Assessment (EIA) Processes in terms of the 2014 National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) EIA Regulations (as amended). Projects 13 to 26 will require Basic Assessment (BA) Processes or will be subjected to separate registration processes in terms of the EGI Standard (Government Gazette (GG) 47095; Government Notice (GN) 2313, dated 27 July 2022).

Note that separate reporting will also be followed for Projects 13 to 26 based on the relevant environmental management instrument implemented at the time. Projects 13 to 26 are not the subject of this current EIA Report.

This EIA Report only addresses Kudu Solar Facility 6 (i.e., Project 6) (hereafter referred to as the "Kudu Solar Facility" or "proposed project"), and separate reports have been compiled for each of the Solar PV Facilities (i.e., Projects 1 to 12).

The proposed project is not located within any of the Renewable Energy Development Zones (REDZs) that were gazetted in GG 41445, GN 114 on 16 February 2018; and GG 44191, GN 144 on 26 February 2021, hence it is subjected to a full Scoping and EIA Process with a 107-day decision-making timeframe, as opposed to a BA Process and 57-day decision-making timeframe allowed for in the REDZs. The proposed project is located within the Central Strategic Transmission Corridor that was gazetted in GN 113 on 16 February 2018; however, the benefits only apply specifically to the EGI projects (Projects 13 – 26). This is depicted in Figure A.

The Competent Authority for this proposed project is the National Department of Forestry, Fisheries and the Environment (DFFE). It is intended that this project will be bid into a future bidding program of the Renewable Energy Independent Power Producer Programme (REIPPPP) [or another future process linked to the IRP].

Study Area and Buildable Areas

The study area or preferred site for all 12 of the Kudu Solar Facilities constitutes the full extent of the eight affected farm portions indicated in Table A. The total extent of the study area is approximately 8 150 hectares (ha). The preferred site serves as the study area for this Scoping and EIA Process.

Table A: Farm portions and SG codes for the Study Area.

FARM PORTION	SG CODE
Remaining Extent of the Farm Bas Berg No. 88	C05700000000008800000
Remaining Extent of Portion 3 of the Farm Bas Berg No. 88	C05700000000008800003
Portion 4 (Portion of Portion 3) of the Farm Bas Berg No. 88	C05700000000008800004
Remaining Extent of Portion 2 (Middel Plaats) (a Portion of Portion 1) of the Farm Grasspan No. 40	C05700000000004000002
Remaining Extent of the Farm Annex Wolve Kuil No. 41	C05700000000004100000
Portion 1 (Wolve Kuil West) of the Farm Annex Wolve Kuil No. 41	C05700000000004100001
Portion 2 of the Farm Wolve Kuil No. 43	C05700000000004300002
Remaining Extent of the Farm Wolve Kuilen No. 42	C05700000000004200000

At the commencement of this Scoping and EIA Process, the Original Scoping Buildable Areas were identified by the Project Developer following the completion of high-level environmental screening based on the Screening Tool.

Following the identification of sensitivities during the Scoping Phase, the Project Developer considered such sensitivities and formulated the Revised Scoping Buildable Areas. The Revised Scoping Buildable Areas were used to inform the design of the layout, and further assessed during this EIA Phase of the project in order to identify the preferred development footprint of the proposed project on the approved site as contemplated in the accepted Scoping Report.

PROJECT ENVIRONMENTAL IMPACT ASSESSMENT TEAM

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), ABO Wind appointed the Council for Scientific and Industrial Research (CSIR) to undertake the required Scoping and EIA Process in order to determine the potential biophysical, social and economic impacts associated with undertaking the proposed development. The project team and the relevant specialists are indicated in Table B below.

Table B. Project Team for the Scoping and EIA Process.

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Environmental Management Services (CSIR)		
Paul Lochner *(Registered EAP (2019/745))*	CSIR	EAP, Technical Advisor and Quality Assurance
Rohaida Abed (*Pr.Sci.Nat.* and *Registered EAP (2021/4067))*	CSIR	EAP and Project Manager
Helen Antonopoulos	CSIR	Project Officer
Sonto Mkize	CSIR	Project Officer
Phindile Mthembu	CSIR	Project Officer
Luanita Snyman van der Walt *(Pr.Sci.Nat.)*	CSIR	GIS Specialist
Lizande Kellerman *(Pr.Sci.Nat.)*	CSIR	Public Participation Specialist
Specialists		
Johann Lanz (*Pr.Sci.Nat.)*	Private	Agriculture and Soils Compliance Statement
Corne Niemandt *(Pr.Sci.Nat.)* Samuel Laurence *(Pr.Sci.Nat.)*	Enviro-Insight cc	Terrestrial Biodiversity, Terrestrial Plant Species, and Terrestrial Animal Species
Toni Belcher *(Pr.Sci.Nat.)* Dana Grobler *(Pr.Sci.Nat)*	Private	Aquatic Biodiversity Impact Assessment
Chris van Rooyen Albert Froneman (*Pr.Sci.Nat.)*	Chris van Rooyen Consulting	Avifauna Impact Assessment
Quinton Lawson (*SACAP, 3686*) Bernard Oberholzer (*SACLAP, 87018*)	QARC and BOLA	Visual Impact Assessment
Dr Jayson Orton (*APHP: Member 43; ASAPA CRM Section: Member 233*)	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology and Cultural Landscape)
Dr John Almond *(PSSA and APHP Member)*	Natura Viva cc	Palaeontology Site Sensitivity Verification Report
Tony Barbour and Schalk van der Merwe	Private	Socio-Economic Impact Assessment
Annebet Krige *(Pr Eng)*	Sturgeon Consulting	Traffic Impact Assessment
Debbie Mitchell *(Pr Eng)*	Ishecon cc	Battery Storage High Level Safety, Health and Environment Risk Assessment

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Dale Barrow (*Pr.Sci.Nat.)* Christel van Staden (*Cand.Sci.Nat.)* Shane Teek (*Cand.Sci.Nat.)* Louis Jonk *(Pr.Sci.Nat.)* Julian Conrad	GEOSS South Africa (PTY) Ltd	Geohydrology Assessment
Shane Teek (*Cand.Sci.Nat.)* Hardy Luttig Julian Conrad	GEOSS South Africa (PTY) Ltd	Geotechnical Assessment
Rohaida Abed *(Pr.Sci.Nat.* and *Registered EAP (2021/4067))* Helen Antonopoulos Lizande Kellerman *(Pr.Sci.Nat.)*	CSIR	Civil Aviation Site Sensitivity Verification
Rohaida Abed *(Pr.Sci.Nat.* and *Registered EAP (2021/4067))* Helen Antonopoulos Lizande Kellerman *(Pr.Sci.Nat.)*	CSIR	Defence Site Sensitivity Verification

The specialist assessments have been detailed during the EIA Phase and comply with Appendix 6 of the 2014 NEMA EIA Regulations (as amended), or the Assessment Protocols published in GN 320 on March 2020; or the Assessment Protocols published in GN 1150 on October 2020. However, the BESS High Level Safety, Health and Environment Risk Assessment serves as a technical report and the aforementioned legislation will thus not be applicable.

PROJECT DESCRIPTION

It is important to point out at the outset that the exact specifications of the proposed project components will be determined during the detailed design and engineering phase prior to construction (subsequent to the issuing of EA, should it be granted for the proposed project). A summary of the key components of the proposed project is provided in Table C below.

Table C. Summary of the proposed project components and associated infrastructure.

Component	Description
Solar Field	
Type of Technology	Solar Photovoltaic (PV) Technology
Generation Capacity (Maximum Installed)	▪ Up to 150 MWac
Total developable area that includes all associated infrastructure within the fenced off area of the PV facility	▪ Approximately 265 ha
PV Panel Structure (with the following possible tracking and mounting systems): ▪ Single Axis Tracking structures (aligned north-south); ▪ Dual Axis Tracking (aligned east-west and north-south); ▪ Fixed Tilt Mounting Structure; ▪ Mono-facial Solar Modules; or ▪ Bifacial Solar Modules.	▪ Height: Approximately 3.5 m (maximum)
Building Infrastructure	
Auxiliary Buildings	▪ Type: These include, but are not limited to, Operation and Maintenance (O&M) building / centre, site office, workshop,

Component	Description
	staff lockers, bathrooms/ablutions, warehouses, guard houses, etc. ▪ Cumulative Footprint: Approximately up to 5000 m^2 ▪ Height: Up to 10 m
Inverter/Transformer Stations	▪ Preliminary average number of stations: 27 ▪ Height: Approximately 3 m ▪ Footprint: Approximately 220 m^2 each
On-site Substation Complex	▪ Components of the on-site substation complex: o On-site Independent Power Producer (IPP) or Facility Substation (~1 ha)[2]. o Solid State Lithium Ion or Redox Flow Battery Energy Storage System. Refer to the details below. o Switching Station and Collector Station (~2 ha). **This forms part of Projects 13 – 24 and will be assessed as part of separate processes. It is important to mention here for contextualisation (it does not appear in the Application for EA or relevant listed activities).** ▪ Footprint of the on-site substation complex: Up to approximately 8 ha ▪ Height of the on-site substation complex: Up to 10 m ▪ Capacity of the on-site substation complex: This varies according to the detailed design and requirements from potential clients, however a capacity stepping up from 22 kV or 33 kV to 132 kV is estimated.
Associated Infrastructure	
Battery Energy Storage System (BESS)	▪ Technology: Solid State Lithium-Ion BESS or Redox Flow BESS (both options have been considered in the Scoping and EIA Process). Both technologies were deemed acceptable by the Environmental Assessment Practitioner (EAP) and specialists. However, the DFFE requested that preferred technology be selected. **Therefore, Solid State Lithium Ion BESS is selected as the preferred technology for authorisation**. However, should the need to change the technology arise in future, it is understood that an EA amendment process can be followed as both technologies have been assessed as part of the EIA Phase. ▪ Footprint: Approximately 1 ha ▪ Height: Up to 10 m ▪ Capacity: Up to 500 MW / 500 MWh

[2] As confirmed with the DFFE, the on-site substation complex can be included within the current Application for EA.

Component	Description
On-site medium voltage internal cables	▪ Placement: Underground or above ground in certain sections ▪ Capacity: 22 or 33 kV ▪ Depth: Maximum depth of 1.5 m
Underground low voltage cables or cable trays	▪ Depth: Maximum depth of 1.5 m
Access roads (including upgrading and widening of existing roads, where relevant)	▪ Details: Existing roads will be used as far as practically achievable to access the site. The Traffic Specialist has noted that the main roads leading to the proposed project site are of a sufficient width. However, upgrading of the main access point from the R48 will be required. This is specifically at the intersection of the TR38/01 (i.e. R48) and DR3093, which will require an existing island of approximately 60 m^2 to be removed and surfaced to accommodate the turning movements of vehicles.
Internal roads	▪ Details: New internal service roads will need to be established (i.e. new roads within the fenced off area of the PV Facility, and new roads between the closest existing road and the PV Facility to gain access). These would either comprise farm roads (compacted dirt/gravel) or paved roads. ▪ Width: o Within the PV Facility: Up to 5 m o Between the existing road and PV Facility: Up to 8 m
Fencing around the PV Facility Perimeter	▪ Type: Could be palisade, mesh or fully electrified. A single perimeter fence is proposed around the PV Facility. ▪ Height: Up to 3 m
Storm water channels	▪ Details to be confirmed once the Engineering, Procurement and Construction (EPC) contractor has been selected and the design is finalised. Where necessary, a detailed storm water management plan would need to be developed.
Panel cleaning and maintenance area	▪ The type of panels to be used (and panel cleaning) will be confirmed during detailed design/engineering phase. The panel cleaning and maintenance area will form part of the O&M Auxiliary Buildings (located at the on-site substation complex).
Work area during the construction phase (i.e. laydown area)	▪ Temporary Laydown: Up to 7 ha. ▪ The need for a permanent laydown area will be confirmed during the detailed design/engineering phase.
Water Requirements	▪ Approximately 9 000 m^3 of water is estimated to be required per year for the construction phase. ▪ Approximately 1 000 m^3 of water is estimated to be required per year for the operational phase. ▪ Water requirements during the decommissioning phase are unknown at this stage, however they are expected to be similar to the construction phase. ▪ Potential sources: Local municipality, third-party water supplier, existing boreholes or drilled boreholes on site.
Construction Period	▪ 12 – 18 months
Operational Period	▪ Once the commercial operation date is achieved, the proposed facility will generate electricity for a minimum period of 20 years.

APPROACH TO THE EIA PROCESS

As noted above, in terms of the 2014 NEMA EIA Regulations (as amended), a full Scoping and EIA Process is required for the proposed project. The need for the Scoping and EIA is triggered by, amongst others, the inclusion of Activity 1 listed in GN R325 (Listing Notice 2):

- *"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs (a) within an urban area; or (b) on existing infrastructure".*

Chapter 4 of the EIA Report contains the detailed list of activities contained in GN R327, R325 and R324 which are triggered by the various project components and thus form part of this Scoping and EIA Process.

The Public Participation Process (PPP) for this Scoping and EIA Process is being undertaken in compliance with Chapter 6 of the 2014 NEMA EIA Regulations (as amended). An integrated PPP is being undertaken for all 12 proposed Solar PV facilities. The Scoping and EIA Process commenced in December 2022, and a pre-application meeting with the National DFFE was held on 26 April 2022 (Reference Number: 2022-04-0005). The Draft Scoping Report was made available for a 30-day comment period in December 2022, and the Final Scoping Report was submitted to the DFFE in February 2023, and thereafter accepted in March 2023.

The Draft EIA Report was made available to all Interested and/or Affected Parties (I&APs), Organs of State and relevant stakeholders for a 30-day review period, extending from **2 June 2023 to 3 July 2023.** The Draft EIA Report was uploaded to the project website (i.e., https://www.csir.co.za/environmental-impact-assessment) for potential and registered I&APs to access it. As a supplementary mechanism, the Draft EIA Report was also uploaded to an alternative web-platform i.e., Google Drive. Written notification of the commencement of the EIA Phase and the availability of the Draft EIA Report for comment was sent to all potential and registered I&APs, Organs of State and key relevant stakeholders included on the project database via email, where email addresses were available. This notification was sent at the commencement of the 30-day review period on the Draft EIA Report and included information on the proposed project and notification of the release and availability of the report. Various reminder emails were also sent to the stakeholders, and key stakeholders were called telephonically, followed by a confirmation of discussion email or text message. Refer to Appendix H.4 of this EIA Report for proof of such correspondence. Copies of all written comments received during the 30-day review of the Draft EIA Report have been incorporated into a detailed Comments and Responses Report, and addressed, as applicable and where relevant, and included in this Final EIA Report. The Final EIA Report (i.e., this report) has been submitted to the DFFE, in accordance with Regulation 23 of the 2014 NEMA EIA Regulations (as amended), for decision-making.

SUMMARY OF IMPACT ASSESSMENT FINDINGS AND RECOMMENDED MANAGEMENT ACTIONS

The findings and impact assessment of the detailed specialist assessments (included as Chapters 6 to 17), as well as other relevant project information are included and integrated into the EIA Report. An Environmental Management Programme (EMPr) for the Solar PV Facility and a Generic EMPr for the on-site substation are included in Appendix I and J of this EIA Report, respectively. The EMPr is based on the recommendations for mitigation measures and management actions provided by the specialist team for the planning and design, construction, operational and decommissioning phases of the proposed project.

This section provides a summary of the key impacts that were identified and assessed in detail by the specialists during the EIA Phase. Note that several mitigation measures have also been provided by the specialists, however only selected key measures are noted in Table D below.

Table D. Summary of Issues and Key Impacts that were identified and assessed during the EIA Phase as part of the Specialist Impact Assessments, including recommended mitigation measures and management actions.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
Chapter 6 – Agriculture Compliance Statement	**Negative Direct Impacts:** **Construction Phase**: • Loss of agricultural potential by occupation of land. • Loss of agricultural potential by soil degradation. Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. • Loss of agricultural potential by dust generation. **Decommissioning Phase**: • Loss of agricultural potential by soil degradation. Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. • Loss of agricultural potential by dust generation. **Positive Indirect Impacts (mainly during operations):** • Increased financial security for farming operations. • Improved security against stock theft and other crime due to the presence of security infrastructure and security personnel at the energy facility.	**Design Phase:** ▪ Design an effective system of stormwater run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion. This is included in the stormwater management plan. **Construction and Decommissioning Phases:** ▪ Implement an effective system of stormwater run-off control, where it is required (as specified above). ▪ Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion. ▪ If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface. **Operational Phase:** ▪ Maintain the stormwater run-off control system. Monitor erosion and remedy the stormwater control system in the event of any erosion occurring. ▪ Facilitate re-vegetation of denuded areas throughout the site.
Chapter 7: Terrestrial Biodiversity, Terrestrial Plant Species, and	**Negative Direct Impacts:** **Construction Phase:** • Habitat loss and fragmentation • Loss of protected species • Increased alien invasive species	**Construction Phase:** ▪ No development should take place within High sensitivity areas or buffer zones. Accordingly, the Koppies habitat (where relevant) should be avoided. The Watercourse habitats of medium sensitivity

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
Terrestrial Animal Species Assessment	• Increased erosion and soil compaction • Littering and general pollution **Operational Phase:** • Loss of species composition and diversity • Increased alien invasive species • Littering and general pollution **Decommissioning Phase:** • Loss of habitat • Increased alien invasive species **Cumulative Impacts – Construction Phase and Negative:** • Loss of habitat and vegetation	should be avoided, as recommended by the Aquatic specialist. ▪ No construction related activities, such as the site camp, storage of materials, temporary roads or ablution facilities may be located in the high sensitivity areas. ▪ Where the approved layout designs impact on individuals, permit applications are required for either the relocation or destruction of provincially protected species (Northern Cape Nature Conservation Act No.9 of 2009) and for protected trees in terms of the National Forests Act No. 84 of 1998. ▪ Alien invasive species establishment and spreading should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested with such plants. ▪ Utilise existing access routes as far as possible. Confine the movement of vehicles to the access routes to and from the site and to the construction areas. ▪ Rehabilitate new vehicle tracks and areas where the soil has been compacted as soon as possible. ▪ Monitor the entire site for signs of erosion. ▪ General good housekeeping in terms of spills, refuelling and waste management. These have been included in the Environmental Management Programme. **Operational Phase:** ▪ The loss of species composition and diversity cannot be mitigated due to a permanent structure which will change microclimatic conditions for the life of the facility operation. ▪ Implement appropriate rehabilitation measures to restore each habitat to a natural state that is representative of the respective vegetation type after construction. ▪ Follow an alien and invasive species control and monitoring plan. ▪ General good housekeeping in terms of spills, refuelling and waste management. These have been included in the Environmental Management Programme. **Decommissioning Phase:** ▪ The loss of vegetation is unavoidable within the approved layout development footprint, but sensitive areas must be avoided. ▪ Rehabilitation and alien invasive management as per the construction and operational phase.
Chapter 8: Aquatic Biodiversity	**<u>Negative Direct Impacts:</u>** **Construction Phase:** ▪ Disturbance of aquatic habitat and impact on aquatic biota; ▪ Removal of indigenous aquatic vegetation and associated loss of aquatic ecological integrity and functionality;	**Construction Phase:** ▪ Ensure the final layout of the PV facility and associated infrastructure avoids watercourses and recommended buffers as far as possible; utilisation should be made of existing disturbed areas where possible. The medium sensitivity aquatic habitats should be avoided in the layout design, with only low-sensitivity habitats being disturbed during construction. Note that this has

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	▪ Water supply for construction and stress on available water resources; ▪ Road crossing structures may impede flow in the aquatic features; ▪ Alien vegetation infestation within the aquatic features due to disturbance; and ▪ Increased sedimentation and contamination of surface water runoff may result from construction activities. **Operational Phase:** ▪ Ongoing disturbance of aquatic features and associated vegetation along access roads or adjacent to the infrastructure that needs to be maintained; ▪ Modified runoff characteristics from hardened surfaces has the potential to result in erosion of adjacent watercourses; and ▪ Water supply and water quality impacts (e.g. contamination from sewage) as a result of the operation of the proposed Solar Facility and associated infrastructure. **Decommissioning Phase:** ▪ Increased disturbance of aquatic habitat due to the increased activity; and ▪ Increased sedimentation and contamination of surface water runoff. **<u>Negative Cumulative Impacts:</u>** **Construction and Decommissioning Phases:** ▪ Increased disturbance of aquatic habitat due to the increased activity in the wider area. **Operational Phases:** ▪ Degradation of ecological condition of aquatic ecosystems	been achieved in the EIA Phase, whereby the recommended development setbacks (i.e. recommended setback from the wider floodplain adjacent to the larger rivers) have been adopted in the identification of the development footprints. Minor encroachment to the recommended 35 m buffer adjacent to the watercourse along the eastern edge of the facility is however deemed acceptable. The recommended avoidance areas have been avoided. ▪ Clearing of indigenous vegetation should not take place within the aquatic features and the recommended buffers. ▪ Rehabilitate disturbed aquatic habitats by revegetating them with suitable local indigenous vegetation. ▪ Water use for construction should be minimised as much as possible. The water should be obtained from an existing water allocation or other viable water sources for construction purposes. ▪ The road crossing structures should be designed to not impede flow in watercourses - low water crossing is preferred. Use existing crossings, as best as possible and where allowable. ▪ The existing road infrastructure, particularly within the floodplain, should be utilised as far as possible to access new infrastructure to minimise the overall disturbance. It is recommended that any new linear type of infrastructure crossings over watercourses be placed where there are existing structures or road crossings within the watercourse corridors, where possible. ▪ Undertake monitoring for the growth of alien vegetation. **Operational Phase:** ▪ Implement avoidance setbacks as recommended above the for the construction phase. ▪ Develop a stormwater management plan for the proposed development that addresses the stormwater runoff from the developed areas. ▪ Stormwater run-off infrastructure must be designed to mitigate both the flow and water quality impacts of any stormwater leaving the developed areas. The runoff should rather be dissipated over a broad area covered by natural vegetation or managed using appropriate shaping of the road with berms or channels and swales adjacent to hardened surfaces where necessary. Should any erosion features develop, they should be stabilised immediately. ▪ Sewage generated within the site should be discharged to a conservancy tank that is properly serviced and regularly evacuated to nearby wastewater treatment works. **Decommissioning Phase:** ▪ Minimise works within aquatic ecosystems. If the project layout avoided these areas, the decommissioning works would also be able to avoid aquatic habitats as delineated. Note that all aquatic

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		areas recommended for avoidance have been avoided in the EIA phase layout identification. ▪ Rehabilitate and revegetate disturbed areas, where required. ▪ Decommissioning activities within aquatic features should be undertaken in the dry season where possible.
Chapter 9: Avifauna Assessment	**<u>Negative Direct Impacts:</u>** **Construction Phase:** ▪ Displacement due to disturbance associated with the construction of the solar PV plant and associated infrastructure. **Operational Phase:** ▪ Displacement due to habitat transformation associated with the presence of the solar PV plant and associated infrastructure. ▪ Collisions with the solar panels. ▪ Entrapment in perimeter fences. ▪ Electrocutions in the onsite substation complex. ▪ Electrocution of priority species on the internal 33kV powerlines. **Decommissioning Phase:** ▪ Displacement due to disturbance associated with the decommissioning of the solar PV plant and associated infrastructure. **<u>Negative Cumulative Impacts:</u>** **Construction and Decommissioning Phases:** ▪ Displacement due to disturbance associated with the construction and decommissioning of the solar PV plants and associated infrastructure. **Operational Phase:** ▪ Displacement due to habitat transformation associated with the presence of the solar PV plants and associated infrastructure. ▪ Collisions with the solar panels. ▪ Entrapment in perimeter fences. ▪ Electrocutions in the onsite substation complexes. ▪ Electrocution of priority species on the internal 33kV powerlines.	**Construction Phase:** ▪ Activity should as far as possible be restricted to the footprint of the infrastructure. ▪ Measures to control noise and dust should be applied according to best practice in the industry at the time. ▪ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. ▪ Access to the rest of the property must be restricted. ▪ The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint is concerned. ▪ A 1km all infrastructure exclusion zone around the Verreaux's Eagle nest at -30.227660° 24.329773° must be implemented to provide unhindered access to the nest. The development footprint assessed in this report does not infringe on this buffer. **Operational Phase:** ▪ The recommendations of the botanical specialist must be strictly implemented, especially as far as limiting the vegetation clearance to what is absolutely necessary, and rehabilitation of transformed areas are concerned. ▪ Where possible, surface water (pans, dams and water troughs) must be buffered by a minimum of 50m to ensure unhindered access of priority species to the water. No PV panels should be constructed in this zone. Note that some of the waterpoints in the development footprint will be removed, however, since the minimum circular solar panel exclusion zone of 50m will be applied, the removal of some of the waterpoints will therefore not be a significant impact. ▪ A single perimeter fence should be used. ▪ The hardware within the proposed substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site-specific mitigation (insulation) be applied reactively. This is an acceptable approach because Red List priority species are unlikely to frequent the substation and be electrocuted. ▪ Use underground cabling as far as possible. Where the use overhead lines are unavoidable due to technical constraints, a bird-friendly pole design must be used. The avifaunal specialist must sign off on the pole design.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		Decommissioning Phase: ▪ Activity should as far as possible be restricted to the footprint of the infrastructure. ▪ Measures to control noise and dust should be applied according to best practice in the industry at the time. ▪ Maximum use should be made of existing access roads during the decommissioning phase and the construction of new roads should be kept to a minimum as far as practical. ▪ The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the activity footprint is concerned.
Chapter 10: Visual Impact Assessment	**<u>Negative Direct Impacts:</u>** **Construction Phase:** ▪ Potential effect of dust and noise from trucks and construction machinery during the construction period, and the effect of this on nearby farmsteads and visitors to the area. ▪ Potential visual effect of haul roads, access roads, stockpiles and construction camps in the visually exposed landscape. **Operational Phase:** ▪ Potential visual intrusion of solar arrays and related infrastructure on receptors including glint and glare. ▪ Potential visual impact of an industrial type activity on the pastoral / rural character and sense of place of the area. **Decommissioning Phase:** ▪ Potential visual effect of any remaining structures, platforms and disused roads on the landscape. **<u>Negative Cumulative Impacts:</u>** **Construction, Operational and Decommissioning Phases:** ▪ Potential combined visual effect of the proposed 12 solar PV facilities in the study area, seen together with other existing and proposed renewable energy facilities in the area, and could potentially increase the overall cumulative visual impact.	**Construction Phase:** ▪ Locate construction camps, batching plants and stockpiles in visually unobtrusive areas, away from the public road and Middelplaas-Noord farmstead. ▪ Implement EMPr with ECO during construction. **Operational Phase:** ▪ Substation and BESS to be located in an unobtrusive low-lying area, away from the public road and Middelplaas-Noord farmstead. ▪ Muted natural colours and non-reflective finishes to be used for structures generally. ▪ Internal access roads to be as narrow as possible, and existing roads or tracks used as far as possible. ▪ Outdoor/ security lighting to be fitted with reflectors to obscure the light source, and to minimise light spillage. ▪ Internal powerlines (i.e. 22 kV or 33 kV) to be located underground where possible. (In some cases, such as stream crossings, internal powerlines may need to be above ground). ▪ Outdoor signage to be discrete and commercial / billboard signage avoided. **Decommissioning Phase:** ▪ Solar arrays and infra-structure to be removed and recycled. ▪ Access roads no longer required to be ripped and regraded. ▪ Exposed or disturbed areas to be revegetated to blend with the surroundings.
Chapter 11: Heritage Impact Assessment (Archaeology and Cultural Landscape)	**<u>Negative Direct Impacts:</u>** **Construction Phase:** ▪ Potential impacts to archaeology; ▪ Potential impacts to graves; and ▪ Potential impacts to the cultural landscape. **Operational Phase:** ▪ Potential impacts to the cultural landscape. **Decommissioning Phase:** ▪ Potential impacts to the cultural landscape.	**Construction Phase:** ▪ Pre-construction survey in short grass conditions. ▪ Flag all features adjacent to the access road as No-Go areas and monitor for compliance (ECO). ▪ Report any chance finds of dense clusters of artefacts or other features. Protect in situ and appoint archaeologist to sample as needed. ▪ Report any chance finds of graves to SAHRA and/or an archaeologist. Protect in situ and appoint archaeologist to exhume. ▪ Minimise duration of construction period.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	<u>Negative Cumulative Impacts:</u> **Construction, Operational and Decommissioning Phases:** ▪ Potential impacts to the cultural landscape. **Construction Phase:** ▪ Potential impacts to archaeology; and ▪ Potential impacts to graves.	▪ Ensure effective rehabilitation, at the end of the construction period, of areas not needed during operation. **Operational Phase:** ▪ Ensure that all maintenance vehicles and operational activities stay within designated areas. ▪ Paint buildings in earthy colours to reduce contrast. ▪ Make use of motion detectors and downlighting to reduce night-time light pollution. **Decommissioning Phase:** ▪ Minimise duration of decommissioning period. ▪ Ensure effective rehabilitation of the entire site once the infrastructure has been removed.
Chapter 12: Palaeontology Site Sensitivity Verification Report	▪ The study area has been confirmed as low to very low palaeo-sensitivity. Provided that the Chance Fossil Finds Protocol is incorporated into the EMPrs and fully implemented during the construction phase of the solar PV facility, there are no objections on palaeontological heritage grounds to authorisation of the proposed project. Pending the discovery of significant new fossil finds before or during construction, no further specialist palaeontological studies, reporting, monitoring or mitigation are recommended for the proposed project.	▪ The Chance Fossil Finds Protocol has been incorporated into the project EMPrs (Appendix I and Appendix J of this EIA Report).
Chapter 13: Socio-Economic Assessment	**<u>Direct Negative Impacts</u>** **Construction Phase:** ▪ Impacts associated with the presence of construction workers on local communities. ▪ Impacts related to the potential influx of job seekers. ▪ Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site. ▪ Increased risk of grass fires associated with construction related activities; ▪ Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles. ▪ Impact on productive farmland. **Operational Phase:** ▪ Visual impacts and associated impacts on sense of place. ▪ Potential impact on property values. ▪ Potential impact on tourism. **Decommissioning Phase:** ▪ Social Impacts associated with retrenchment, including loss of jobs and source of income. **<u>Direct Positive Impacts</u>**	Note that several mitigation and enhancement measures have been identified in the assessment. The list below is only a summary of some of the recommendations. **Positive Impacts – Enhancement Measures:** **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 Renosterberg Local Municipality (RLM) and the Emthanjeni Local Municipality (ELM) to establish the existence of a skills database for the area. If such as database exists, it should be made available to the contractors appointed for the construction phase. ▪ The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	Construction Phase: ▪ Creation of employment and business opportunities, and opportunity for skills development and on-site training. **Operational Phase:** ▪ Establishment of infrastructure to improve energy security and support renewable sector. ▪ Creation of employment opportunities. ▪ Benefits associated with socio-economic contributions to community development. ▪ Benefits for local landowners. **<u>Cumulative impacts:</u>** ▪ Negative: Cumulative impacts on sense of place ▪ Negative: Cumulative impact on local services and accommodation ▪ Positive: Cumulative impact on local economy.	▪ 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. ▪ 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. **Operational Phase:** ▪ 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. ▪ Implement agreements with affected landowners on which the PV facility will be constructed. **Negative Impacts – Mitigation Measures:** **Construction Phase:** ▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase. ▪ Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase. ▪ 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. ▪ Timing of construction activities should be planned to avoid / minimise impact on key farming activities. ▪ 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. **Operational Phase:** ▪ The recommendations of the Visual Impact Assessment should be implemented. ▪ The potential impact of the Kudu Solar Facility 6 on the hunting activities on Grass Pan 40/4 should be discussed with the relevant lessee (Jakkalskuil operation). **Decommissioning Phase:** ▪ The proponent should ensure that retrenchment packages are provided for all staff retrenched when the plant is decommissioned.

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
		▪ All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning.
Chapter 14: Traffic Impact Assessment	**Direct Negative Impacts** **Construction and Decommissioning Phases:** ▪ Potential congestion and delays on the surrounding road network. ▪ Potential impact on traffic safety and increase in accidents with other vehicles or animals. ▪ Potential change in the quality of the surface condition of the roads. ▪ Potential noise and dust pollution. **Operational Phase:** ▪ The traffic generated during the operational phase are mainly related to the staff that will be transported to and from the sites and are not anticipated to have a significant traffic impact on the surrounding road network. **Cumulative Negative Impacts** **Construction and Decommissioning Phases:** ▪ Potential congestion and delays on the surrounding road network. ▪ Potential impact on traffic safety and increase in accidents with other vehicles or animals. ▪ Potential change in the quality of the surface condition of the roads. ▪ Potential noise and dust pollution.	**Construction and Decommissioning Phases:** ▪ Stagger delivery trips and schedule trips, including staff trips outside of peak hours where possible. ▪ Implement speed control by means of a stop and go system and speed limit road signage within the construction and decommissioning site. ▪ Ensure all vehicles are roadworthy, visible, adequately marked, and operated by an appropriately licenced operator. ▪ Regular maintenance of internal farm access roads by the contractor. ▪ Ensure private access roads that are impacted on by the proposed development are restored to original pre-construction road condition. ▪ Implement dust control on gravel roads within the construction and decommissioning site.
Chapter 15: Battery Energy Storage System High Level Safety, Health and Environment Risk Assessment	Various risks were identified in terms of safety, health and the environment due to the proposed BESS. The BESS High Level Safety, Health and Environment Risk Assessment identified risks, hazards, and consequences, such as, but not limited to: ▪ Human Health - chronic exposure to toxic chemical or biological agents. Causes - Construction materials such as cement, paints, solvents, welding fumes, truck fumes etc. Consequences - Employee / contractor illness. ▪ Human Health - exposure to noise. Causes - Drilling, piling, generators, air compressors. Consequences - Adverse impact on hearing of workers. Possible nuisance factor in near-by areas. ▪ Human and Equipment Safety - exposure to fire radiation Causes – ▪ Involvement in an external fire. Fire involving fuels used in construction vehicles or vehicles themselves (e.g., tyre fire). Fire due to uncontrolled welding or other hot-work. Consequences - Injuries due to radiation especially amongst first responders and bystanders. Fatalities unlikely from the heat radiation as not highly flammable nor massive fire.	▪ There are numerous different battery technologies but using one consistent battery technology system for the BESS installations associated with all the proposed Kudu Solar Facilities 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 Battery Management System (BMS) with deviation monitoring and trips, leak detection systems. ▪ Ensure that the technical and system suggestions for reducing risks, as specified in the assessment, specifically in terms of preventative and mitigative measures are included in the design. ▪ The overall design should be subject to a full Hazard and Operability Study (HAZOP) prior to finalisation of the design. ▪ For Redox Flow systems, an end of life (and for possible periodic purging requirements) solution for the large quantities of hazardous electrolyte should be investigated, e.g., can it be returned to the supplier for re-conditioning. ▪ Prior to importing any solid-state battery containers into the country, the contractor should ensure that: o An Emergency Response Plan is in place that would be applicable for the full route

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	▪ Human and Equipment Safety - exposure to explosion over pressures. Transformer shorting / overheating / explosion. Consequences - Potential fatalities, e.g., amongst first responders. Damage to nearby equipment.	from the ship to the site. This plan needs to include details of the most appropriate emergency response to fires both while the units are in transit and once they are installed and operating. o 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. ▪ In order to limit the possibility of domino failures the BESS should be separated from the substation by at least 20 m. ▪ Where there is a choice of alternative locations for the BESS, those that are further from water courses would be preferred. Redox Flow BESS hazards are mostly related to possible loss of containment of electrolyte and 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 run-off should not enter water courses directly. ▪ Finally, it is suggested once the BESS technology has been chosen and more details of the final design are available, the necessary updated Risk Assessments should be in place (prior to commencement, after EA and other necessary approvals are granted (should such be granted)).
Chapter 16: Geohydrology Assessment	**<u>Direct Negative Impacts:</u>** **Construction Phase:** ▪ Potential lowering of the groundwater level from construction requirements; ▪ Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages. **Operational Phase:** ▪ Potential lowering of the groundwater level from operational requirements. ▪ Potential impact of groundwater quality as a result of using cleaning agents for cleaning the solar panels. ▪ Groundwater quality deterioration as a result of electrolyte that will be used for the BESS. **Decommissioning Phase:** ▪ Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages. ▪ Potential lowering of the groundwater level from decommissioning requirements. **<u>Cumulative Negative Impacts:</u>** ▪ Potential lowering of groundwater level during the construction, operational and	**Construction and Decommissioning Phases:** ▪ Adhere to the borehole's safe yield and to monitor water levels and flow. ▪ Boreholes must be correctly yield tested according to the National Standard (SANS 10299-4:2003, Part 4 – Test pumping of water boreholes). This includes a Step Test, Constant Discharge Test and recovery monitoring. ▪ Vehicles must be regularly serviced and maintained to check and ensure there are no leakages. ▪ Diesel fuel storage tanks, if required, should be above ground on an impermeable surface in a bunded area. ▪ Vehicles and equipment should also be refuelled on an impermeable surface. A designated area should be established at the construction site camp for this purpose, if off-site refuelling is not possible. If spillages occur, they should be contained and removed as rapidly as possible, with correct disposal procedures of the spilled material, and reported. **Operational Phase:** ▪ Borehole's safe yield, monitoring and yield testing as per the construction phase. ▪ Use environmentally safe cleaning agents that breakdown naturally and do not cause adverse effects. ▪ Ensure that all electrolyte or chemicals stored or used on site have secondary containment systems

Specialist Assessment undertaken	Key Impacts Identified	Recommended Mitigation Measures
	decommissioning phase for all 12 of the Kudu PV facilities. ▪ Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages from the construction and the decommissioning phase for all 12 Kudu facilities. ▪ Potential of impact on groundwater quality as a result of using cleaning agents for cleaning the solar panels during the operational phase for all the 12 Kudu facilities. ▪ Potential impact on groundwater quality as a result of electrolyte that will be used for the BESS. ▪ Other wind and solar, and EGI projects within a 30 km radius.	in place with reliable leak detection, annunciation in place. Ensure that all chemicals are handled on concrete bunded surfaces and not on bare soil. ▪ Wastewater produced by fire hydrants should not be allowed to runoff into the environment. ▪ It is recommended that all BESS's are placed a minimum of 50m from any borehole.
Chapter 17: Geotechnical Assessment	**<u>Direct and Cumulative Negative Impacts:</u>** **Construction Phase:** ▪ Displacement of geologic materials. ▪ Contamination of geologic materials as a consequence of the construction activities. **Operational and Decommissioning Phase:** ▪ Increased unnatural hard surfaces. ▪ Contamination of geologic materials as a consequence of typical maintenance and decommissioning activities.	**Construction Phase:** ▪ Favour dolerite as an aggregate (as opposed to Karoo sandstones and mudstones). Subject to investigation. ▪ Any road cuttings should be designed by an appropriately qualified professional. ▪ Drainage in the region should be designed and managed appropriately. ▪ Investigate and confirm the geotechnical suitability of each structure (or other appropriate level of investigation) prior to construction (i.e., determine that soil with an adequate bearing capacity is obtained beneath each footing). Such investigations would not be required to fulfil the requirements of this EIA process. However, it would be necessary prior to construction. ▪ Only strip vegetation necessary for the next phase of construction. ▪ Install temporary drainage to divert stormwater away from active construction activities, where required. ▪ Where impacted through construction-related activities, all sloped areas must be stabilised to ensure proper rehabilitation is affected and erosion is controlled. **Operational Phase:** ▪ Install drainage to divert stormwater away from activities, roads/tracks, structures, where required. ▪ During the execution of the operations, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained; **Decommissioning Phase:** ▪ Land rehabilitation to near natural state, i.e., removal of foundations and backfilling of any resultant voids within the soil, as well as removal of hard surfaced areas. Replacement soil should be sourced locally to ensure homogeneity. ▪ Reinstate natural topography where cut-to-fill embankments have been constructed.

SUMMARY OF KEY IMPACT ASSESSMENT FINDINGS

Based on the findings of the detailed specialist impact assessments, which are included in Chapter 6 to 17 of this EIA Report, the proposed project is considered to have an **overall Moderate to Very Low negative environmental impact** and an **overall High to Moderate positive socio-economic impact** (with the implementation of respective mitigation and enhancement measures). Table E below provides a summary of the impact assessment for the proposed project post mitigation for direct impacts. Table F provides the same information for the cumulative impacts.

As indicated in Table E, the direct negative impacts were rated with an overall **Low to Very Low** post-mitigation impact significance for the **construction phase**, with only Terrestrial Biodiversity impacts being rated as Moderate. In terms of the **operational phase**, the majority of the direct negative impacts were rated with a **Low to Very Low** post-mitigation impact significance, with the exception of Visual and Socio-Economic impacts, which were respectively rated with a Moderate and Moderate to Low post-mitigation impact significance. The **decommissioning phase** has an overall **Low to Very Low** post-mitigation impact significance for direct negative impacts. In terms of direct positive impacts, the Socio-Economic impacts are rated as having a **Moderate** impact significance post-mitigation for the construction phase; and **Moderate to High** impact significance post-mitigation for the operational phase.

Based on Table F, the majority of the cumulative negative impacts were rated with a **Low** post-mitigation impact significance for the **construction phase**, with the exception of Terrestrial and Socio-Economic impacts, which were respectively rated with a Moderate and Moderate to Low post-mitigation impact significance. A similar trend is applicable to the **operational phase**, with Visual and Avifauna impacts being rated as **Moderate**; and Socio-Economic impacts being rated as **Moderate to Low**.

During the **decommissioning phase**, the majority of cumulative impacts were rated with a **Low to Very Low** post-mitigation impact significance, whereas some were not identified, or are considered insignificant, or could not be measured empirically at the time of assessment. In terms of cumulative positive impacts, the Socio-Economic impacts were rated with an overall **Moderate** post-mitigation impact significance.

Table E: Overall Impact Significance with the Implementation of Mitigation Measures for Direct Negative and Positive Impacts.

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
DIRECT NEGATIVE IMPACTS			
Agriculture and Soils	Low	Low	Low
Terrestrial Biodiversity, Terrestrial Plant Species, and Terrestrial Animal Species	Moderate	Low	Low
Aquatic Biodiversity	Very Low	Very Low	Very Low
Avifauna	Low	Very Low / Low	Low
Visual	Low	Moderate	Very Low
Heritage (Archaeology and Cultural Landscape)	Low	Low	Low
Palaeontology	Insignificant and/or not identified and/or not applicable	Insignificant and/or not identified and/or not applicable	Insignificant and/or not identified and/or not applicable
Socio-Economic	Low	Moderate / Low	Low
Traffic	Low / Very Low	Insignificant	Low / Very Low
Geohydrology	Low / Very Low	Low / Very Low	Very Low
Geotechnical	Very Low	Very Low	Very Low
DIRECT POSITIVE IMPACTS			
Socio-Economic	Moderate	Moderate / High	Insignificant and/or not identified and/or not applicable

Table F: Overall Impact Significance with the Implementation of Mitigation Measures for Cumulative Negative and Positive Impacts.

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
CUMULATIVE NEGATIVE IMPACTS			
Agriculture and Soils	Low	Low	Low
Terrestrial Biodiversity, Terrestrial Plant Species, and Terrestrial Animal Species	Moderate	Low	Low
Aquatic Biodiversity	Very Low	Very Low	Very Low
Avifauna	Low	Moderate	Low
Visual	Low	Moderate	Very Low

Specialist Assessment	Construction Phase		Operational Phase		Decommissioning Phase	
Heritage (Archaeology and Cultural Landscape)	Low		Low		Low	
Palaeontology	Insignificant and/or not identified and/or not applicable		Insignificant and/or not identified and/or not applicable		Insignificant and/or not identified and/or not applicable	
Socio-Economic	Low	Moderate	Low	Moderate	Insignificant and/or not identified and/or not applicable	
Traffic	Low		Insignificant		Low	Very Low
Geohydrology	Low	Very Low	Low	Very Low	Very Low	
Geotechnical	Low		Low		Low	
CUMULATIVE POSITIVE IMPACTS						
Socio-Economic	Moderate		Moderate		Moderate	

OVERALL ENVIRONMENTAL IMPACT ASSESSMENT AND REASONED OPINION FROM THE EAP

The information presented above, contributes to this overall environmental impact statement and reasoned opinion from the EAP as to whether the proposed project should or should not be authorised, including any conditions that should be made in respect of the authorisation (should it be granted).

Based on the findings of the detailed specialist assessments and technical studies, which all recommend that the proposed project can proceed and should be authorised by the DFFE, the proposed project is considered to have an **overall Moderate to Very Low negative environmental impact, and an overall Moderate to High positive socio-economic impact** (with the implementation of respective mitigation and enhancement measures).

The proposed project will take place within the development footprint on the preferred and approved project site, as contemplated in the accepted Final Scoping Report. The development footprint and buildable areas will avoid the “no-go” sensitive features identified and mapped by the respective specialists, where relevant and applicable.

This EIA has considered the nature, scale and location of the development as well as the wise use of land. The need for new solar PV generation capacity is specified in the energy planning for the country. The proposed project will therefore assist in generating additional electricity that is urgently required to address the shortage of generation capacity in the country.

The proposed project will be in line with the objective of the PKSDM IDP in terms of creating more job opportunities. The proposed Solar PV Facility will assist in local job creation during the construction and operational phases of the project (if approved by the DFFE). It should be noted that employment during the construction phase will be temporary and provided for a period of 12 to 18 months.

Section 24 of the Constitutional Act states that "*everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*". Based on this, this EIA was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures, and monitoring requirements. These measures will be undertaken to promote conservation by avoiding the sensitive environmental features present on site and through appropriate monitoring and management plans (refer to the EMPr in Appendix I and Appendix J of this EIA Report).

The outcomes of this project therefore succeed in meeting the environmental management objectives of protecting the ecologically sensitive areas and supporting sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development in the towns nearest to the project site. The findings of this EIA show that all natural resources will be used in a sustainable manner (i.e., this project is a renewable energy project, and the majority of the negative site specific and cumulative environmental impacts are considered to be of low significance with mitigation measures implemented), while the benefits from the project will promote justifiable economic and social development. Furthermore, additional specialist studies (not recommended by the Screening Tool) have been undertaken as part of the EIA Process to ensure that all potential environmental impacts are addressed and assessed.

Provided that the specified mitigation measures and management actions are applied effectively throughout, it is recommended that the proposed project receive EA in terms of the 2014 NEMA EIA Regulations (as amended), promulgated under the NEMA. It is recommended that the **EA be valid for a period of 10 years.** It is understood that the information contained in this EIA Report and appendices is sufficient to make a decision in respect of the activity applied for.