



KHAUTA NORTH SOLAR FARM

PROPOSED DEVELOPMENT OF A 165 MW PHOTOVOLTAIC SOLAR FARM ON PORTION 0 OF THE FARM KOPJE ALLEEN NO. 81 AND PORTION 1 OF THE FARM KOPJE ALLEEN NO. 81, KHAUTA NORTH SOLAR PV FACILITY, NEAR RIEBEECKSTAD, MATJHABENG LOCAL MUNICIPALITY, FREE STATE PROVINCE

FINAL SCOPING REPORT

DFFE REF NO: 14/ 12/16/3/3/2/2221

NOVEMBER 2022

APPLICANT:

**KHAUTA NORTH SOLAR PV FACILITY RF (PTY) LTD
P.O. Box 762,
WILDERNESS
6560**

COMPILED BY:

ENVIROWORKS

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QUALITY AND REVISION RECORD

QUALITY APPROVAL

	CAPACITY	NAME	SIGNATURE
EAP	Environmental Consultant and Project Manager (EAPASA Reg: 2019/1311)	Elana Mostert	
Reviewer	Environmental Consultant (EAPASA Reg: 2020/714, SACNASP Reg:119286, IAIA Sa Reg 5602))	Michelle Boshoff	

This report has been prepared in accordance with Enviroworks Quality Management System.

REVISION RECORD

REVISION NO.	OBJECTIVE	CHANGE	DATE	AUTHOR
1	Draft Scoping Report	Internal Review	16 August	Elana Mostert
2	Draft Scoping Report	Client Review	18 August	Elana Mostert
	Draft Scoping Report	DFFE Review	28 October 2022	M Solomons
3	Final Scoping Report	Internal Review	8 November 2022	Michelle Boshoff
4	Final Scoping Report	DFFE Review	Pending	

DISTRIBUTION

DISTRIBUTION LIST
Registered and Potential Registered and Affected Parties.
Department of Forestry, Fisheries and the Environment.
Khauta North Solar PV Facility RF (Pty) Ltd

SUBMISSION AND CORRESPONDENCE

SUBMISSION / CORRESPONDENCE	DATE
Application Form Submitted	17 August 2022
Application Form Acknowledged	17 August 2022
Draft Scoping Report Submitted	6 October 2022
Draft Scoping Report Acknowledged	13 October 2022
Comment on Draft Scoping Report	28 October 2022
Final Scoping Report Submitted	18 October 2022
Final Scoping Report Acknowledged	Pending
Final Scoping Report Accepted	Pending

DISCLAIMER

Even though every care is taken to ensure the accuracy of this report, environmental assessment studies are limited in scope, time and budget. Discussions are to some extent made on reasonable and informed assumptions built on bona fide information sources, as well as deductive reasoning. Since environmental impact studies deal with dynamic natural systems additional information may come to light at a later stage during the impact assessment phase. The author does not accept responsibility for conclusions made in good faith based on own databases or on the information provided. Although the author exercised due care and diligence in rendering services and preparing documents, he accepts no liability, and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from or in connection with services rendered, directly or indirectly by the authors and by the use of this document. This report should therefore be viewed and acted upon with these limitations in mind.

REPORT DETAILS

Table 1: Summary and Report Details of the Draft Scoping Report.

TITLE	DRAFT SCOPING REPORT FOR KHAUTA NORTH SOLAR FARM
<p>Purpose of this report:</p>	<p>This Final Scoping Report is available to all registered and potential Interested and Affected Parties (I&APs).</p> <p>This Draft Scoping Report forms part of a series of reports and information sources that are being provided during the Scoping and Environmental Impact Reporting (Scoping & EIR) process for the proposed Khauta North photovoltaic (PV) Renewable Energy Facility in the Free State Province. This is the first report in the series that forms part of the Scoping & EIR process. Registered I&APs will be given an opportunity to comment on the following reports as part of the Scoping & EIR process:</p> <ul style="list-style-type: none"> • Draft Scoping Report; • Draft Environmental Impact Assessment Report; and • Draft Environmental Management Programme. <p>In accordance with the EIA Regulations, 2014 (as amended), the objectives of the Scoping Process is to, through a consultative process:</p> <ol style="list-style-type: none"> (a) identify the relevant policies and legislation relevant to the activity; (b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location; (c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process; (d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment; (e) identify the key issues to be addressed in the assessment phase;

	<p>(f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration, and probability of the impacts to inform the location of the development footprint within the preferred site; and</p> <p>(g) identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.</p> <p>The Draft Scoping Report was available to all stakeholders for a thirty (30) day review and comment period from 17 August 2022 – 16 September 2022. An application has been submitted to the Department of Forestry, Fisheries and the Environment (DFFE) for the proposed Khauta North Solar Farm on 18 August 2022.</p>
Prepared for:	Khauta North Solar PV Facility RF (Pty) Ltd
Published by:	18 August 2022
Author:	Elana Mostert
DFFE Case Officer & Ref. No:	Mr Jay-Jay Mpelane Ref. No.: 2022-06-0040 (pre-application reference) DFFE Ref. No.:14/12/16/3/3/2/2195
Date:	18 August 2022

TECHNICAL DETAILS

The following technical details are included as a quick reference roadmap to the proposed project.

Table 2: Technical Details of the Propose Khauta North Solar PV Facility.

ADMINISTRATION	
Applicant Details	Applicant Name: Khauta North Solar PV Facility RF (Pty) Ltd
	Company/ Trading name: WKN Windcurrent SA (Pty) Ltd
	Company Registration Number: 2010/022616/07
SITE DETAILS	
Description of affected farm portion	<p><u>Solar PV (SPV) Facility and Associated Infrastructure:</u></p> <ul style="list-style-type: none"> Portion 0 of Farm 81 (Kopje Alleen) in extent 254.31ha (Title Deed T3378/2013) situated in the Matjhabeng Local Municipality, Welkom Registration Division District, Free State Province; Portion 1 of Farm 81 (Kopje Alleen) in extent 261.18ha both (Title Deed T3378/2013) situated in the Matjhabeng Local Municipality, Welkom Registration Division District, Free State Province;
21 Digit Surveyor General codes	<p><u>SPV Facility and Associated Infrastructure:</u></p> <ul style="list-style-type: none"> Portion 0 of Farm 81 (Kopje Alleen) - F0240000000008100000 Portion 1 of Farm 81 (Kopje Alleen) - F0240000000008100001
Title Deed	T3378/2013
Photographs of the site	Refer to Section 3.1

MAIN INFRASTRUCTURE DETAILS	
Type of technology	Solar Photovoltaic (SPV) Facility
Structure orientation	The panels will either be fixed to a single-axis horizontal tracking structure where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture the most sun.
Structure Height of Solar Panels	More or less six metres ($\pm 6m$). The uppermost vertical point of the solar panel when tilted at an angle could reach a height of eight metres ($\pm 8m$).
Anticipated surface area to be covered by SPV Facility	Approximately 273 ha
Anticipated Laydown area	Area up to 3.9 ha (which will be a permanent laydown area for the BESS during the operational phase).
Anticipated Battery Energy Storage System (BESS) area	Area up to 3.9 ha
Structure height of BESS	Up to eight metres ($\pm 8m$).
Expected capacity of the facility (MW)	165 MW
GRID CONNECTION DETAILS	
Own-Build Grid Connection - Power Lines and Substations	<p>The proposed grid connection infrastructure includes underground medium-voltage cabling between the project components and the facility's on-site 33/132 kV collector substation. It is estimated that the maximum size of the facility's 33/132 kV collector substation will not exceed 1.1 ha.</p> <p>Please note that three additional SPV Facilities are proposed on the adjacent farms: namely, the 50 MW Khauta e Nyane SPV Facility, 80 MW Khauta West SPV Facility and 110 MW Khauta South SPV Facility and are concurrently being considered and assessed through separate Environmental Impact Assessment (EIA) processes.</p> <p>The proposed Khauta North SPV Facility substation will collect the power from the SPV cluster which will then be connected via a proposed 132 kV Overhead Powerline that will facilitate the connection to the Everest Main Transmission Substation (Alternative Option 1) or to the Leander Main Transmission Substation (Alternative Option 2) via a single or double circuit 132 kV Overhead Powerline. The proposed 132 kV Overhead Powerline connecting the facility's substation to the Main Transmission Substation will be assessed as part of a separate Application for Environmental Authorisation.</p> <p>It should further be noted that the above-mentioned proposed Power Lines and Substation falls within the Central Corridor geographical area referred to as "strategic transmission corridors" identified in Government Notice No. 113 published under Government Gazette No. 41445 of 16 February 2018 and Government Notice No. 1637 published under</p>

	<p>Government Gazette No. 45690 on 24 December 2021. These areas were chosen based on the findings of strategic environmental assessments: where development is prioritised in specific geographic locations which have an abundance of resources (such as sun), low environmental sensitivity, and where there is an increased need for socio-economic development, among other things.</p>	
ADDITIONAL INFRASTRUCTURE DETAILS		
Other proposed infrastructure	Auxiliary Buildings	<p>The buildings and facilities needed to service the Khauta North SPV Facility are a control room, a general office, an access control and security building, ablution facilities and kitchen area, a small workshop, and a store. The total area occupied is ± 0.5 ha</p>
	External access road	<p>The external main access road shall utilise the existing farm road on Portion 0 of Farm 81 (Kopje Alleen) leading to the Khauta North Solar PV Facility, accessed from the secondary road S173 that branches of the R34 and R70. The main access roads will not exceed 8 m in width for the wearing course. The total width including all stormwater management structures will not exceed 10 m in width. The majority of the access road will comprise the expansion of sections of the existing farm road.</p>
	Internal roads	<p>A network of internal access roads (each with a width of up to 6 m) will be constructed to provide access to the solar PV modules, main control room, administration office, and various components of the facility.</p>
	Stormwater management infrastructure	<p>Cut-off trenches and side drains along roads will be required to intercept the surface flow and redirect it away from the project infrastructure. Infiltration trenches and retention areas may be required to attenuate the surface flow and recharge groundwater on the project site.</p>

CONTENT OF SCOPING REPORT

The table below lists the minimal contents of a Scoping Report in terms of Appendix 2 of the Environmental Impact Assessment Regulations of 2014 (Government Notice No. 982, as amended).

Table 3: General Requirements of a Scoping Report as set out in GN R. 982, as amended.

REQUIREMENT	DETAILS
(a) details of - (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Annexure F3
(b) the location of the activity, including – (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 3
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is (i) a linear activity, a description, and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 3
(d) a description of the scope of the proposed activity, including- (i) all listed and specified activities triggered;	The listed and specified activities triggered are detailed in section 5.1.2 of this report.
(ii) a description of the activities to be undertaken, including associated structures and infrastructure;	The description of the proposed activity is detailed in section 4 of this report.
(e) a description of the policy and legislative context within which the development is proposed including identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that apply to this activity and are to be considered in the assessment process;	The legislative and policy context is included in section 5 of this report.
(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;	The need and desirability of the project are included in section 6 of this report.

REQUIREMENT	DETAILS
(g) a full description of the process followed to reach the proposed preferred activity, site, and location within the site, including - (i) details of all the alternatives considered;	The details of all alternatives considered are included in section 7.
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	The details of the public participation to be undertaken are detailed in section 9 as well as the details of the public participation for the remainder of the environmental impact and reporting process are detailed in section 11.13 of this report.
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Issues and responses are included in Final Scoping Report as Appendix E.
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage, and cultural aspects;	Detailed site description and attributes are included in section 8 of this report.
(i) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which these impacts – (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed, or mitigated;	A description of potential impacts identified by the EAP as well as participating specialists is included in section 10 of this report.
(ii) the methodology used in determining and ranking the nature, significance, consequences, extent, duration, and probability of potential environmental impacts and risks associated with the alternatives;	The methodology used for the determination and ranking of significance is included in section 11.9 of this report. Please also refer to the specific methodologies in the specialist reports attached in Annexures E.
(iii) 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;	This scoping report identifies the potential positive and negative impacts associated with the proposed project. These are included in section 10.1 of this report. An assessment of the significance of these identified impacts will take place in the impact assessment phase of this environmental process.
(iv) the possible mitigation measures that could be applied and the level of residual risk;	The site-specific mitigation measures from the specialist studies and EAP will be identified and incorporated in the draft Environmental Impact Report.
(v) the outcome of the site selection matrix;	Details regarding the criteria for the selection of the preferred site selection is included in section 7.2 and 7.3 of this report.

REQUIREMENT	DETAILS
(i) if no alternatives, including alternative locations for the activity, were investigated, the motivation for not considering such; and	Alternatives have been discussed in Section 7.2 of this report.
(ii) a concluding statement indicating the preferred alternatives, including the preferred location of the activity;	Please note that the proposed site (refer to section 7.2) and location (refer to section 7.1) and layout (i.e. the proposed development footprint) have been informed and developed based on the constraints and sensitivities identified through specialist' site sensitivity verification assessments, undertaken during May 2022, by various specialist that have been commissioned to outline the possible site sensitivities within the greater study area (i.e. identification of sensitive areas, no-go areas and buffers for sensitive areas). Please refer to section 8.6 as example.
(j) an undertaking under oath or affirmation by the EAP in relation to – (i) the correctness of the information provided in the report; (ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	The signed EAP declaration is appended to the application form submitted simultaneously with this Draft Scoping Report to DFFE.
(k) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	Please refer to the Plan of Study for EIA included in section 11.13 of this report.
(l) where applicable, any specific information required by the competent authority;	The submission of this Draft Scoping Report to the Competent Authority allows the Competent Authority to advise the EAP on any specific additional requirements.
(m) any other matter required in terms of section 24(4)(a) and (b) of the Act.	Compliance with this section will be required at a later stage, once the Competent Authority has considered the contents of this Draft Scoping Report.

EXECUTIVE SUMMARY

Development Proposal:

The Proponent, Khauta North Solar PV Facility RF (Pty) Ltd, proposes to establish a commercial photovoltaic (PV) energy facility (hereafter referred to as Khauta North SPV Facility) with an output capacity of 165 megawatt (MW). Based on a pre-feasibility analysis and environmental screening undertaken by Khauta North SPV Facility RF (Pty) Ltd, a favourable area has been identified for consideration, which will be verified through a Scoping and Environmental Impact Reporting (EIA) process.

This project forms part of the promulgated IRP 2010-2030 plan that identified electricity generation technology (specifically renewable energy – solar PV) to meet the expected demand growth up to 2030. This project aims to produce distributed generation and to provide off-grid electricity.

The Khauta North SPV Facility and associated infrastructure are proposed to be located on Portion 0 of the Farm Kopje Alleen No. 81 and Portion 1 of the Farm Kopje Alleen No. 81, about 4km north-east of Riebheekstad, within the Matjhabeng Local Municipality in the Free State Province. The facility is envisaged to have a maximum export capacity of 165 MW power to be achieved through several arrays of PV panels and the following associated infrastructure:

- PV modules and mounting structures (monofacial or bifacial) with fixed, single or double axis tracking mounting structures;
- Associated stormwater management infrastructure;
- Battery Energy Storage System (BESS);
- Site- and internal access roads (up to 6 m wide);
- Auxiliary buildings (offices, parking, etc.);
- Ablution facilities and associated infrastructure;
- Temporary laydown area during the construction phase (which will be a permanent laydown area for the BESS during the operational phase);
- On-site 33/132 kV substation (facility substation) and associated 33/132 kV collector transmission line;
- Grid connection infrastructure including medium-voltage cabling between the project components and the facility substation (underground cabling will be used where practical);
- Perimeter fencing; and,
- Rainwater and/or groundwater storage tanks and associated water transfer infrastructure.

The proposed Khauta North SPV Facility development requires a development footprint of approximately 273 ha and is located within the broader area of approximately 515 ha of the two farm portions. Therefore, as part of the alternatives that will be assessed within the EIA process the final setting of the PV facility will be appropriately sited within the broader area such that any identified environmental sensitivities can be avoided.

The Final Scoping Report is aimed at detailing the nature and extent of the proposed Khauta West SPV Facility, identifying the scope of the processes to be followed during the EIA phase to identify the potential impact that may be associated with the proposed project, and defining the extent of studies required within the EIA phase.

Brief Description of the Biophysical Environment:

Vegetation - The development area lies in the *Grassland Biome* and the endemic vegetation is classified as *Highveld Alluvial Vegetation*. This vegetation type is considered *least threatened* and occurs throughout the Free State, North West and Gauteng Provinces at altitudes ranging between 1 000 m to 1 500 m. The *Highveld Alluvial Vegetation* consists of grasslands together with riparian thickets dominated by *Acacia karroo* trees.

Heritage - The study has identified no impacts to archaeological heritage that will need to be mitigated prior to construction activities commencing. The cultural landscape, primarily agriculture (i. e. grazing), with farm fences, tracks, water storage, and windmills, being the main tangible evidence of the landscape, has low heritage significance.

Plant, Animal and Terrestrial Biodiversity - Areas classified as an ESA 1 or 2 have been classified based on the presence of wetland clusters (as per the Free State Biodiversity Plan, 2015). This will however only be confirmed during the EIA phase of the project. Specialist studies will also be undertaken to determine the current status (e.g., degraded, transformed, intact, etc.) of the CBA and ESA areas.

Palaeontology - The area falls within the Permian bedrocks and Late Caenozoic superficial sediments. A specialist study will be undertaken to determine the site palaeontological sensitivity/importance of the proposed site.

Groundwater - The aquifer beneath this site is classified as an intergranular fractured aquifer and the yield potential ranges between 0.1 - 0.5 ℓ/s. This is a minor aquifer and the depth to groundwater is approximately 38 m below ground level (DWS GRA2, 2005).

Watercourses - A significant first-order seasonal watercourse/tributary associated with the commencement portion of the Sandspruit, flows past the assessment area, directly adjacent north and continues in a westerly direction into the Sandspruit, approximately 400 m - 600 m to the north of the assessment area. Surface water runoff from the central and northern portions of the assessment area situated north of the highpoint/ridge apex, consequently mainly drains towards this watercourse.

Five artificially constructed earth dams are present within- and along the length of the seasonal watercourse/tributary associated, approximately 210 m to the north and east of the assessment area. The watercourse and associated earth dams, house locally distinct and important aquatic and semi-aquatic habitats, which are visibly utilised by various common and habitat-specific waterbirds, amphibian species and aquatic invertebrates for breeding, foraging and/or persistence purposes.

The Commandants Pan constitutes a well-known significantly sized naturally occurring depression pan, which is situated approximately 270 m south-east of the assessment area. The pan is seasonally/temporarily inundated

and the inflow of the pan mainly originates from a significantly sized unchanneled valley-bottom wetland, situated approximately 550 m east of the assessment area.

A significantly sized naturally occurring unchanneled valley-bottom wetland, is located approximately 110m south-east of the assessment area. The localised topography flattens-out slightly in the vicinity of the subsequent unchanneled valley-bottom wetland, which results in this subsequent wetland being seasonally/temporarily inundated.

One naturally occurring depression wetlands are present within the approximate 500 m zone of influence surrounding the assessment area. The wetland is situated approximately 216 m east of the assessment area, respectively.

During the EIA phase, these areas will be assessed, and the development footprint should be selected with the aim to avoid these.

Agricultural Potential - The land type across the site has a high proportion of shallow, clay rich soils predominantly of the Sterkspruit and Valsrivier soil forms that are unsuitable for crop production. The land may therefore only be suitable for grazing, but this will be confirmed in the EIA phase.

Environmental Impact Assessment Process:

The current assessment is being undertaken in terms of the **National Environmental Management Act** (Act No. 107 of 1998) (NEMA)¹. This Act makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the Competent Authority (in this case, the national Department of Forestry, Fisheries and the Environment (DFFE) in respect of the proposed renewable energy facility and its related activities). In addition, but not limited to, the proposed project may also require a Water Use License by submitting a Water Use License Application (WULA) to the Department of Water and Sanitation (DWS) in terms of the National Water Act, 1998 (No. 36 of 1998) (NWA) for the water uses as specified in Section 21 (a), (b), (c), (i) and (g) of the NWA. In addition to the above, a renewable energy facility requires approval from the National Department of Agriculture, Land Reform and Rural Development (DALRRD) if the facility is on agriculturally zoned land.

The proposed development entails a number of listed activities, which require a **Scoping & Environmental Impact Reporting (S&EIR) process**, which must be conducted by an independent Environmental Assessment Practitioner (EAP). King's Landing Trading 507 (Pty) Ltd t/a Enviroworks (hereafter referred to as Enviroworks) has been appointed to undertake this process.

The listed activities associated with the proposed development, as stipulation under the Environmental Impact Assessment (EIA) Regulations of 2014 (GN R.983, GN R.984 and GN R.985) are listed in Table 5 under Section 5.1.2 of this Final Scoping Report. The purpose of these regulations is to avoid negative impacts on the

¹ The Minister of Water and Environmental Affairs promulgated new regulations in terms of Chapter 5 of the National Environmental Management Act (NEMA, Act 107 of 1998), viz, the Environmental Impact Assessment (EIA) Regulations 2014 (as amended in April 2017). These regulations came into effect on 08 December 2014 (amended on 07 April 2017) and replace the EIA regulations promulgated in 2006 and 2010.

environment or where they cannot be avoided, ensure mitigation and management of the impacts to acceptable levels, while optimising positive environmental impacts.

It must be noted that these activities are all to be considered at the scoping phase, but certain of the activities listed in Table 5 under Section 5.1.2 may no longer be relevant after the outcome of the specialist studies and final designs. In this case, the activities forming part of the application may be amended.

Before any of the above-mentioned listed activities can be undertaken, Environmental Authorisation must be obtained from the DFFE.

Evaluation of the Proposed Project:

The potential environmental impacts identified, which are typically associated with solar energy projects, are associated with the construction and operational phases of the proposed project. The following potential environmental impacts will be assessed during the Environmental Impact Assessment phase of the (Scoping & EIR) process:

- An **Avifaunal Impact Assessment** will be conducted by a specialist to provide final recommendations on suitable aquatic avifaunal species and habitat buffer zones.
 - A **Terrestrial Ecological Assessment** will be conducted to assess potential impacts on the ecology and biodiversity including the fauna, flora, and terrestrial biodiversity within the proposed development footprint.
 - A **Soil and Agricultural Potential Assessment** will be conducted by a specialist to assess the potential of soil erosion and the loss of agricultural potential as well as other potential impacts in this specialist field.
 - An **Archaeological Impact Assessment** will be conducted by an Archaeologist to assess whether the construction of proposed project would have any impacts on significant artefacts.
 - The **Visual Impact Assessment** of the PV facility will also be assessed.
- A **Socio-Economic Impact Assessment** will be conducted to assess the potential impacts on the surrounding areas.

The outcome of this Scoping Report has not identified any fatal flaws associated with the proposed development of the Khauta West SPV Facility. Subject to the outcome of the Public Participation Process, it is Enviroworks' reasoned opinion that the project should proceed to the Environmental Impact Assessment phase of the environmental process.

Public Participation:

A general public participation process (PPP) will be followed during the Scoping Phase of the EIA for the proposed Khauta North SPV Facility. The aim and purpose of the PPP is to:

- Ensure all relevant Key stakeholders and Interested and Affected Parties (I&APs) have been identified and invited to engage in the scoping phase;

- Raise awareness, educate and increase understanding of stakeholders about the proposed project, the affected environment and the environmental process being undertaken;
- Create a platform for Key stakeholders and I&APs to freely communicate and issues or concerns and suggestions for enhancing potential benefits and/or to prevent or mitigate impacts;
- Accurately document all opinions, concerns and queries raised regarding the project; and,
- Ensure the issues and concerns of the stakeholders and I&APs related to the project are addressed in an adequate manner.

The Scoping &EIR process has been announced through a Background Information Document (BID) and the Draft Scoping Report (DSR), and advertisements that was published in the Beeld newspaper on Wednesday, **17 August 2022**, and the Vista local newspaper on Thursday, **18 August 2022**. Site notices were also be placed at the corner of the R70 and R34 that turns onto the secondary road S173; adjacent to farm access roads near Portion 0 of Farm 81 (Kopje Alleen) and Portion 12 of Farm 74 (Nooitgedacht); the Riebeeckstad Library; as well as but not limited to, the Matjhabeng Local Municipality building in Welkom. All registered I&APs has been informed of the availability of the draft documentation for comment (as referred to above) when it is made available.

This Draft Scoping Report was made available for comments for 30 calendar days from **17 August 2022** until the **16 September 2022**. Written comments on this Draft Scoping Report were submitted to Enviroworks' Social Facilitation Specialist on or before 16 September 2022.

All registered I&APs has been and will be informed of the availability of the documentation for comment (as referred to above) when it is made available.

GLOSSARY OF TERMS

Alien species: A plant or animal species introduced from elsewhere: neither endemic nor indigenous.

Anthropogenic: Change induced by human intervention.

Applicant: means a person who has submitted an application for an environmental authorisation to the competent authority and has paid the prescribed fee.

Arable potential: Land with soil, slope and climate components where the production of cultivated crops is economical and practical.

Archaeological resources: This includes:

material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artifacts, human and hominid remains and artificial features and structures;

rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10 m of such representation;

wrecks, being any vessel or aircraft, or any part thereof which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artifacts found or associated therewith, which is older than 60 years or which South African Heritage Recourses Act (SAHRA) considers to be worthy of conservation;

features, structures and artifacts associated with military history which are older than 75 years and the site on which they are found.

Alluvial: Resulting from the action of rivers, whereby sedimentary deposits are laid down in river channels, floodplains, lakes, depressions etc.

Biodiversity: The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

Cultural significance: This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

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

Ecology: The study of the interrelationships between organisms and their environments.

Environment: All physical, chemical and biological factors and conditions that influence an object.

Environmental Impact Assessment: In relation to an application, to which Scoping and Environmental Impact Assessment must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.

Environmental Impact Report: In-depth assessment of impacts associated with a proposed development. This forms the second phase of an Environmental Impact Assessment and follows on from the Scoping Report.

Environmental Management Programme: A legally binding working document, which stipulates environmental and socio-economic mitigation measures that must be implemented by several responsible parties throughout the duration of the proposed project.

Ephemeral: When referring to a stream or drainage line, it refers to the flow characteristics by which only periodic surface flows typically occur. Similarly when referring to a pan or depression, this would be characterised by only periods of time when surface water occurs within it, usually associated with the rainy season.

Heritage resources: This means any place or object of cultural significance. See also archaeological resources above.

Hydromorphic / hydric soil: Soil that, in its undrained condition, is saturated or flooded long enough during the growing season to develop anaerobic conditions favouring growth and regeneration of hydrophytic vegetation. These soils are found in and associated with wetlands.

Kilovolt (kV): a unit of electric potential equal to a thousand volts (a volt being the standard unit of electric potential. It is defined as the amount of electrical potential between two points on a conductor carrying a current of one ampere while one watt of power is dissipated between the two points).

Local relief: The difference between the highest and lowest points in a landscape. For this study, it is based on 1:50 000 scale.

Loop-in-loop out: a closed electric or magnetic circuit through which a signal can circulate, as in a feedback control system.

Macro-geomorphological: Related to / on the scale of geomorphic provinces. A geomorphic province is a spatial entity with common geomorphic attributes.

Parabolic trough: Is a type of solar thermal energy collector. It is constructed as a long parabolic mirror (usually coated silver or polished aluminium) with a Dewar tube running its length at the focal point.

Precipitation: Any form of water, such as rain, snow, sleet, or hail that falls to the earth's surface.

Proponent: means a person intending to submit an application for environmental authorisation and is referred to as an applicant once such application for environmental authorisation has been submitted.

Red Data species: All those species included in the categories of endangered, vulnerable or rare, as defined by the International Union for the Conservation of Nature and Natural Resources.

Riparian: The area of land adjacent to a stream or river that is influenced by stream induced or related processes.

Scoping Report: A report that aim to identify the relevant policies, legislation, the need and desirability, proposed alternatives and associated preliminary risks and potential key issues associated with the proposed development. It forms part of the first phase of an Environmental Impact Assessment process.

Soil compaction: Soil becoming dense by blows, vehicle passage or other types of loading. Wet soils compact easier than moist or dry soils.

ABBREVIATIONS

AIA	-	Archaeological Impact Assessment
Amsl	-	above mean sea level
BID	-	Background Information Document
BPEO	-	Best Practicable Environmental Option
CAR	-	Civil Aviation Regulations
CARA	-	Conservation of Agricultural Resources Act
CPA	-	Communal Property Association
CPV	-	Concentrating Photovoltaic
CSP	-	Concentrating Solar Power
DFFE	-	Department of Forestry, Fisheries and the Environment
DESTEA	-	Department of Small Business Development, Tourism and Environmental Affairs (Free State)
DOE	-	Department of Energy
DSR	-	Draft Scoping Report
DWS	-	Department of Water and Sanitation
EAP	-	Environmental Assessment Practitioner
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EMPr	-	Environmental Management Program
EPC	-	Engineering Procurement Contractor
ESA	-	Early Stone Age
FSR	-	Final Scoping Report
GDP	-	Gross Domestic Product
GIS	-	Geographic Information System
GW	-	Gigawatt
Ha	-	Hectare

HIA	-	Heritage Impact Assessment
I&APs	-	Interested and Affected Parties
IDP	-	Integrated Development Plan
IEM	-	Integrated Environmental Management
IEC	-	International Electrotechnical Commission
IPP	-	Independent Power Producer
IRP	-	Integrated Resource Plan
IRR	-	Issues and Response Report
ISEP	-	Integrated Strategic Electricity Planning
kV	-	Kilo Volt
MW	-	Megawatt
MWp	-	Megawatt peak
NEMA	-	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	-	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NERSA	-	National Energy Regulator of South Africa
NIRP	-	National Integrated Resource Plan
NHRA	-	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NSBA	-	National Spatial Biodiversity Assessment
NWA	-	National Water Act, 1998 (Act No. 36 of 1998)
PHRA	-	Provincial Heritage Resources Agency
PM	-	Public Meeting
POC	-	Point of Connection
PPA	-	Power Purchase Agreement
PPP	-	Public Participation Process
PV	-	Photovoltaic
RE	-	Renewable Energy
REIPPP	-	Renewable Energy Independent Power Procurement Program

SADC	-	Southern African Development Community
SAHRA	-	South African Heritage Resources Agency
SANBI	-	South African National Biodiversity Institute
SDF	-	Spatial Development Framework
SKA	-	Square Kilometer Array
SPV	-	Solar Photovoltaic
SR	-	Scoping Report
STEP	-	Subtropical Thicket Ecosystem Plan
STC	-	Standard Test Conditions
W	-	Watt

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1 INTRODUCTION

1.1 INTRODUCTION AND BACKGROUND

The South African Government ratified the Paris Agreement in 2016, and thereby showed the country's commitment to contribute to the global effort to address the challenge of climate change. Globally there is an increasing pressure on countries to increase their share of renewable energy generation due to concerns such as exploitation of non-renewable resources. South Africa currently depends on fossil fuels to supply approximately 90% of its primary energy needs. This reliance on fossil fuels to meet energy requirements is recognized, but as concerns about global climate change grow, South Africa also needs to be a responsible global neighbour.

South Africa's electricity demand is increasing, and in order to match that demand there is a need to supply a diversified power generation that includes renewable energy technologies. These technologies include solar, wind, small utility scale hydro, biomass, biogas and energy storage that the Department of Mineral Resources and Energy (DMRE) intends to develop and implement as identified in the approved Integrated Resource Plan (IRP) 2019. In conjunction with the abovementioned, the current electricity imbalance in South Africa highlights the significant role that renewable energy can play in terms of power supplementation. South Africa experiences some of the highest levels of solar radiation in the world. Most areas in South Africa average more than 2 500 hours of sunshine per year, and average solar-radiation levels range between 4.5 and 6.5kWh/m² in one day (SOLA, 2021). Given that renewables can generally be deployed in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality energy, while reducing expensive transmission and distribution losses.

The need to expand and increase electricity generation capacity in the country is based on national policy and informed by on-going strategic planning undertaken by the DMRE. In pursuit of promoting the country's Renewable Energy development imperatives, Government has been actively encouraging the role of Independent Power Producers (IPPs) to feed into the national grid. Through its Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), the DMRE has been engaging with the sector in order to strengthen the role of IPPs in renewable energy development. Launched during 2011, the REIPPPP is designed so as to contribute towards a target of 3 725MW, and towards socio-economic and environmentally sustainable development, as well as to further stimulate the renewable industry in South Africa. The Khauta North SPV Facility is regarded as an Independent Power Producer (IPP) project and aims to produce distributed generation and to provide off-grid electricity through the implementation of a solar generation system,

To contribute to the long term goal of a sustainable renewable energy industry, Khauta North SPV Facility RF (Pty) Ltd, hereafter referred to as the Applicant, appointed King's Landing Trading 507 (Pty) Ltd t/a Enviroworks, hereafter referred to Enviroworks, as the independent Environmental Assessment Practitioner (EAP) to facilitate the Scoping and Environmental Impact Reporting (S&EIR) process required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998): Environmental Impact Assessment Regulations, 2014 (as amended) for the proposed development of a 165MW SPV facility near Riebeeckstad in the Free State Province.

The proposed Project will have a project design life of 25 years or even up to 30 years. The clean energy from the solar PV facility will be integrated and connected to the Eskom national grid which will be done in conjunction with Eskom, SA's State Owned Company (SOC), which is the national electricity supplier.

1.2 PURPOSE OF THIS FINAL SCOPING REPORT

In accordance with the EIA Regulations, 2014 (as amended), the objectives of the Scoping Process is to, through a consultative process:

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

1.3 STRUCTURE OF THIS REPORT

The Scoping Report generally consists of the following sections:

- **Scoping Phase Methodology**

This section describes the study approach used to gather all the information, assumptions, and limitations during the scoping phase. The chapter also includes the approach that will be considered during the EIA phase of the project.

- **Project Description and Alternatives**

The chapter describes the environmental planning and design aspects of the project. The chapter also addresses design options that were considered in order to ensure that the proposed project is technically feasible without significantly impacting on the biophysical and socio-economic environment.

- **Legal Requirements**

This section outlines legislation, policies and guidelines applicable to the proposed development.

- **Public Participation Process**

This section describes the methodology used for the PPP and the findings or results of this PPP.

- **Description of the Affected Environment**

This chapter describes the key elements of the socio-economic and biophysical environment. This chapter will also incorporate any findings of any studies undertaken during the Scoping phase and issues and concerns raised during the PPP.

- **Identification of Potential Environmental Impacts**

This section is a description of the potential environmental impacts of the proposed PV solar facility based on the field assessment and specialist findings. A summary of the most important findings of the Scoping phase will be provided.

- **Plan of Study of EIA**

This Chapter has been compiled in accordance with Regulations 28 (n) of the EIA Regulations, 2014 (as amended). The Plan of Study for EIA sets out the proposed approach to be followed during the EIA phase. This will include the terms of reference for all specialists and the detailed description of the methodology that will be used to assess all identified impacts, and also the details of the consultation process both with the public and the regulating authorities.

- **Conclusion and Recommendations**

This chapter summarises the key findings and conclusions drawn from the scoping phase, and further provides recommendations for the phases to follow.

1.4 ASSUMPTIONS AND LIMITATIONS

- All information provided by the applicant, engineering team, specialists and I&APs to the Environmental team was correct and valid at the time that it was provided;
- The information provided by the applicant, engineering team and specialists are accurate and unbiased;
- The need and desirability was based on strategic national, provincial and local plans and policies which reflect the interests of both statutory and public viewpoints;
- The EIA process is a project-level framework and is limited to assessing the environmental impacts associated with the project phases of the activity being applied for only;
- Strategic level decision making is achieved through co-operative governance with sustainable development principles underpinning all decision-making;
- The public will receive a fair and recurring opportunity to participate in the EIA process, through the provision of Public Participation timeframes stipulated in the Regulations;
- It is not always possible to involve all I&APs individually. However, every effort has been made to involve as many interested parties as possible; and,
- The scope of this investigation is limited to assessing the environmental impacts associated with the construction, operation and decommissioning of a Photovoltaic (PV) plant.

1.5 GAPS IN KNOWLEDGE

The EIA process is being undertaken prior to the availing of certain information which would be derived from the project design and feasibility studies. As such, technical aspects included herein derive from a range of sources including pre-feasibility engineering and through personal communication with the design team. Given that the EIA process is one of several investigations being done, milestones and key outputs for each of these may not always be available for interrogation into the EIA process. As such, the DFFE and other commenting and decision-making Authorities are required to generate their decision based on the information available to the study at the time, whilst measures can be adopted to manage any changes as conditions within decisions are made.

Enviroworks is an independent environmental consulting firm and as such, all processes and attributes of the EIA are addressed in a fair and unbiased fashion. It is believed that through the running of a transparent and participatory process, risk associated with assumptions, uncertainties and gaps in knowledge can be, and were, minimised.

1.6 UNCERTAINTIES

Given that an EIA involves prediction, uncertainty forms an integral part of the process. Two types of uncertainty are associated with the EIA process, namely process-related and prediction related. The FAO² cites types of uncertainty as discussed by De Jongh in Wathern. These are summarised as follow:

- **Uncertainty of prediction** is critical at the data collection phase as final certainty will only be resolved on implementation of the activity being applied for;
- **Uncertainty of values** depicts the approach assumed during the EIA process, while final certainty will be determined at the time decisions are made. Enhanced communications and widespread co-ordinations can lower uncertainty; and,
- **Uncertainty of related decisions**, relates to the decision-making aspect of the EIA process, which shall be appeased once monitoring of the project phase is undertaken.

The FAO (2010) further stresses the significance of widespread consultation towards minimising the risk of omitting significant impacts. The use of quantitative impact significance rating formulas can further limit the occurrence and scale of uncertainty.

² Dougherty, T.C. and Hall, A.W., 1995. *Environmental impact assessment of irrigation and drainage projects* (Vol. 53). Food & Agriculture Organisation.

2 THE SCOPING PHASE METHODOLOGY

The main purpose of the scoping process is to identify issues surrounding the proposed project. Issues were identified through:

- Desktop assessment of the proposed area;
- Review of available literature;
- Professional judgment;
- Site investigations; and,
- A comprehensive Public Participation Process (PPP).

Through this process the proposed development and alternatives will be identified by following the consideration of relevant natural and social environment elements. The potential impacts the activity will impose on the development footprint on the approved site through the life of the activity, as contemplated in the Final Scoping Report (when accepted), will be discussed in detail in the Draft Impact Assessment Report.

COMPETENT AUTHORITY

The Competent Authority in respect of this application will be the National Department of Forestry, Fisheries and the Environment (DFFE), specifically because the listed activities (section 5.1.2) applied for includes an Energy Generation Facility, which is a national competency. The Department of Small Business Development, Tourism and Environmental Affairs (DESTE) will be notified as a key stakeholder in a commenting capacity on the Scoping and Environmental Impact Reporting (Scoping & EIR) process.

2.2 APPLICATION FORM

An application for Environmental Authorisation (EA) was completed by Enviroworks and will be submitted to the DFFE on 18 August 2022 along with the Draft Scoping Report (DSR).

2.3 CONSULTATION WITH AUTHORITIES AND KEY STAKEHOLDERS

During the scoping phase a number of I&APs, stakeholders and other regulating authorities were identified and will be requested to comment on the DSR in terms of Regulation 41 of the Environmental Impact Assessment (EIA) Regulations of 2014, as amended.

2.4 IDENTIFICATION OF POTENTIAL ENVIRONMENTAL IMPACTS

Potential positive and negative direct and indirect environmental impacts associated with the proposed development were identified within the scoping phase and have been evaluated through desktop studies and site inspections. As early as the scoping phase, a number of specialists have undertaken desktop studies, a site sensitivity verification, and had input into the Scoping Report.

2.5 DRAFT SCOPING REPORT

A DSR with the findings of the scoping phase of the proposed project has been prepared. This report documents the findings identified through the site visit, the professional input of the relevant specialists and the Environmental Assessment Practitioner (EAP) team. The DSR was prepared for purposes of public review and comment.

2.6 PUBLIC PARTICIPATION PROCESS (PPP)

In terms of the EIA Regulations, 2014 (as amended) a detailed and appropriate PPP must be undertaken during the scoping phase. The details of the PPP to be undertaken are presented in **Section 9** of this report.

2.7 PLAN OF STUDY FOR EIA

In terms of the EIA Regulations, 2014 (as amended) a Plan of Study for EIA, must be prepared and submitted as part of the Scoping Report and is presented in **Section 11** of this report.

2.8 FINAL SCOPING REPORT

All public comments on the DSR have been captured in an Issues and Response Report (IRR), and these were considered and included in the Final Scoping Report (FSR). The FSR will be submitted to the DFFE, I&APs and other authorities. All registered I&APs will be notified of the availability of the FSR in order for them to note how their comments and issues were addressed. The FSR will be submitted to the DFFE within 44 calendar days from submitting the Application for Environmental Authorisation and Draft Scoping Report for consideration and approval to proceed with the EIA phase of the proposed project.

3 LOCATION AND PROPERTY DESCRIPTION

The activity entails the development of a solar PV facility and associated infrastructure (hereafter referred to as the Khauta North SPV Facility) on Portion 0 of the Farm Kopje Alleen No. 81 and Portion 1 of the Farm Kopje Alleen No. 81, situated north-east of Riebeeckstad near Welkom in the Matjhabeng Local Municipality in the Free State Province of South Africa.

The proposed project entails the generation of up to a maximum export capacity of 165 Megawatt (MW) to be achieved through several arrays of PV panels. The total footprint of the SPV Facility including associated infrastructure will be approximately 273 hectares (ha) – refer to Table 4 for the general site information and Figure 1 for the location of the proposed development. The property on which the facility is to be constructed will be leased by Khauta North SPV Facility RF (Pty) Ltd from the land owner for the life span of the project (minimum of 20 years).

Table 4: General site information for the Proposed Khauta North SPV Facility.

Description of affected farm portion(s)	<u>Solar PV (SPV) Facility and Associated Infrastructure:</u> <ul style="list-style-type: none"> Portion 0 of Farm 81 (Kopje Alleen) - 254.31 ha in extent Portion 1 of Farm 81 (Kopje Alleen) - 261.18 ha in extent
21 Digit Surveyor General codes	<u>SPV Facility and Associated Infrastructure:</u> Portion 0 of Farm 81 (Kopje Alleen) - F0240000000008100000 Portion 1 of Farm 81 (Kopje Alleen) - F0240000000008100001
Title Deed	<ul style="list-style-type: none"> T3378/2013 - Welkom Registration Division District, Free State Province
Photographs of the site	Refer to section 3.1
GPS Coordinates of the centre point of the Solar PV Facility	<ul style="list-style-type: none"> 27°52'59.55"S; and, 26°52'12.76"E.

The site situated in the Matjhabeng Local Municipality, a Category B municipality in the Lejweleputswa District in the Free State Province, and is located outside the urban area of Riebeeckstad, bordered by agricultural farmland. The project area is situated within Ward 10 of the Matjhabeng Local Municipality.

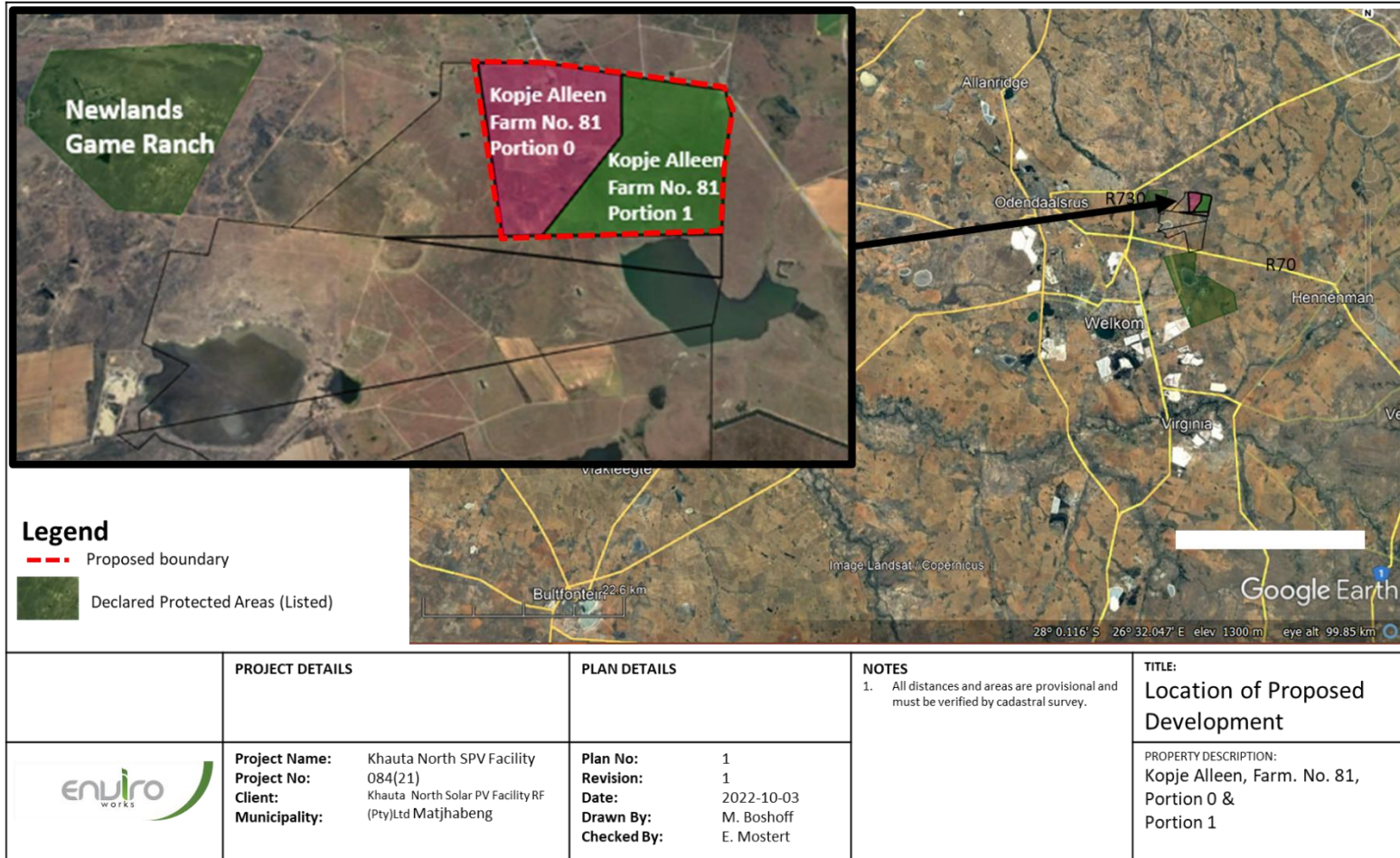


Figure 1: LOCATION OF PROPOSED KHAUTA NORTH SPV FACILITY

3.1 PHOTOGRAPHS OF THE STUDY AREA

Photographs of the centre point location of the proposed Khauta North SPV Facility on Portion 0 of the Farm Kopje Alleen No. 81.



Figure 2: NORTHERN VIEW



Figure 3: NORTH-EASTERN VIEW



Figure 4: EASTERN VIEW:



Figure 5: SOUTH-EASTERN VIEW

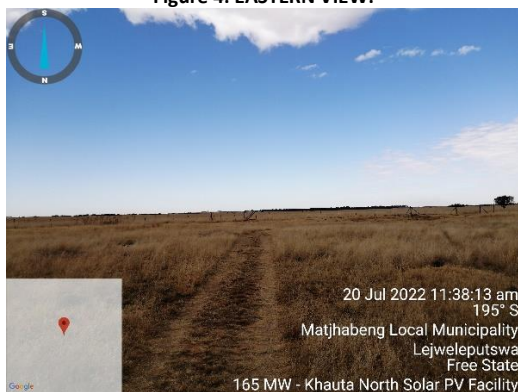


Figure 6: SOUTHERN VIEW



Figure 7: SOUTH-WESTERN VIEW

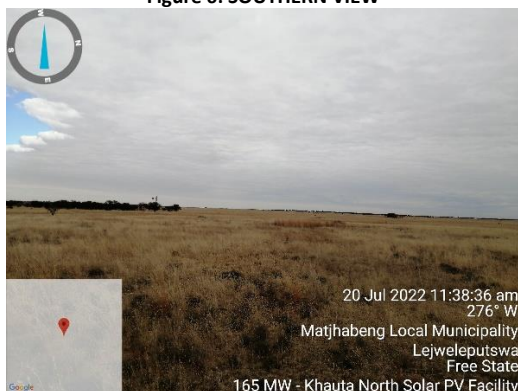


Figure 8: WESTERN VIEW



Figure 9: NORTH-WESTERN VIEW

4 ACTIVITY DESCRIPTION

This section of the Scoping Report summarises the Khauta North SPV Facility project proposal and provides a detailed description of all project components and activities throughout the construction, operation, and decommissioning phases of the project. Please refer to the location map as appended to Appendix A. Detailed plans and layouts will be provided in the draft EIAR for consideration and recommendations.

4.1 PROJECT COMPONENTS AND INFRASTRUCTURE

The Khauta North SPV Facility will be composed of the following infrastructure:

- PV modules and mounting structures (monofacial or bifacial) with fixed, single or double axis tracking mounting structures;
- Associated stormwater management infrastructure;
- Battery Energy Storage System (BESS);
- Site- and internal access roads (up to 6 m wide);
- Auxiliary buildings (Control room, general office, access control and security building, kitchen area with ablution facilities, small workshop, and a store);
- Ablution facilities and associated infrastructure;
- Temporary laydown area during the construction phase (which will be a permanent laydown area for the BESS during the operational phase);
- On-site substation;
- Grid connection infrastructure including medium-voltage cabling between the project components and the facility substation (underground cabling will be used where practical);
- Perimeter fencing; and,
Rainwater and/or groundwater storage tanks and associated water transfer infrastructure.

Some of the components and associated infrastructure are described in more detail in the following sections.

4.1.1 PHOTOVOLTAIC (PV) ARRAY

SPV modules will be connected in series and parallel to form an array of modules, thus increasing total available power output to the needed voltage and current for a particular application. A PV module will be composed of interconnected solar cells that are encapsulated between a glass cover and weatherproof backing. The modules will be typically framed in aluminium frames suitable for mounting.

The PV modules will be mounted on high-rise or elevated structures that are either fixed, at a defined angle, or mounted to a single or double axis tracker to optimise electricity yield. The technology alternatives for the PV modules at this stage are under consideration and will be assessed during the EIR phase.

The figure below depicts the typical layout of a SPV Facility.

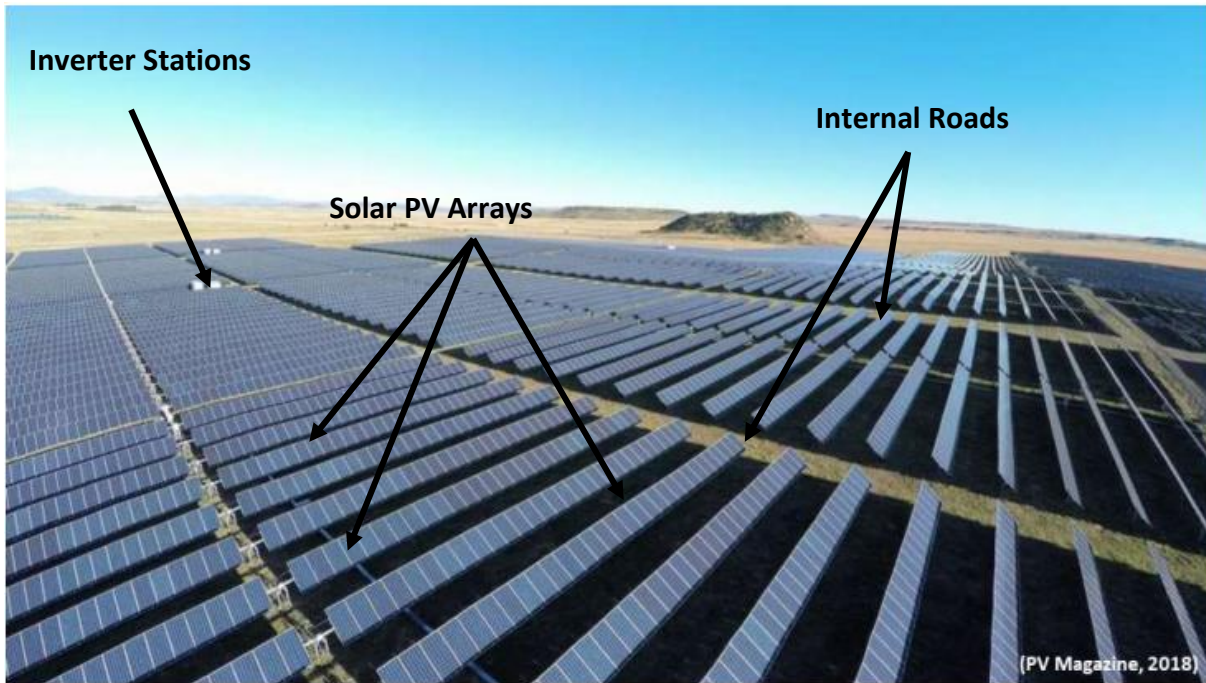


Figure 10: TYPICAL LAYOUT OF A SPV ENERGY FACILITY

It is recommended that the solar panels are placed such that runoff can pass between each module, minimizing the concentration of runoff and allowing vegetation growth between and beneath the arrays (BVi, 2021).

4.1.2 MOUNTING STRUCTURES

Various options exist for mounting structure foundations, which include cast/pre-cast concrete foundations, driven/rammed piles, or ground/earth screws/augured piles. The foundation design will be governed by the supporting conditions and the applied loads: i.e. the site specific geotechnical and groundwater conditions, the PV module support structure and the selected PV technology (fixed or tracking). As the project is located in a seismic hazard zone, earthquake loading must be considered when determining the design loads (BVi, 2021). The construction- and operation phase impacts of these options is considered to be similar, however concrete is least preferred due the effort required at a decommissioning phase in order to remove the concrete from the soil, and therefore its impact on the environment.

The Khauta North SPV Facility will therefore aim to make the most use of either driven/rammed piles, or ground/earth screws mounting systems, and only in certain instances resort to concrete foundations should geotechnical studies necessitate this.

Preferred alternative:

The desktop geotechnical study indicates that piled foundations are likely to be suitable at this site. Additional soil improvement or soil replacement may be required, depending on the extent of the active clay in the soil profile (BVi, 2021).

4.1.3 GRID CONNECTION AND CABLING

The proposed Khauta North SPV Facility grid connection infrastructure includes underground medium-voltage cabling between the project components and the facility substation. It is envisaged that the electrical cables will be installed using trenches that are excavated adjacent to the internal roads. The depth of the cabling will typically be approximately 1000 mm below the ground but the exact depth should be established at the detailed design stage.

It is proposed that a 33/132 kV substation is constructed, hereafter referred to as the facility substation, which will include inverter-stations, transformers, switchgear and internal electrical reticulation. It is estimated that the maximum size of the facility substation will not exceed 1.1 hectare (ha). The generated electricity from the Khauta SPV Cluster shall then be transmitted to the Khauta North SPV Facility's collector substation with a 33/132 kV Overhead Power Line linking Khauta West- and Khauta North- to Khauta South SPV Facility's substation³. Thereafter, the generated electricity is to be transmitted with a 132 kV Overhead Power Line⁴ to connect to the Eskom grid at a suitable location.

4.1.4 BATTERY STORAGE ENERGY SYSTEM

The need for a Battery Storage Energy System (BESS) originates from the fact that electricity is only produced by the solar field while the sun is shining, while the peak demand may not necessarily occur during daylight hours. Therefore, the storage of electricity in BESS and supply thereof during peak demand will mean that the facility is more efficient, reliable and electricity supply is more consistent. Currently, battery technology alternatives being considered are either solid state batteries or redox flow batteries.

The proposal for Khauta North SPV Facility includes the installation of an area up to 4 ha BESS situated adjacent to the on-site facility substation and auxiliary buildings.

4.1.5 AUXILIARY BUILDINGS

The proposed buildings and facilities needed to service the Khauta North SPV Facility are a control room, a general office, access control and security building, ablution facilities and kitchen area, a small workshop and a store. The total area occupied is approximately 0.5 ha.

4.1.6 EXTERNAL AND INTERNAL ACCESS ROADS

The proposed site is located approximately 6km from Riebeeckstad and 20 km from Welkom. The main access road (external road), accessed from the secondary road S173 that branches off the R34 and R70, links to the existing farm road on Portion 0 of Farm 81 (Kopje Alleen), which shall provide access to the Khauta North SPV Facility and thereafter internal access to Khauta West- and the Khauta e Nyane SPV Facility within the development footprint.

³ The 50 MW Khauta West SPV Facility and 110 MW Khauta South SPV Facility are concurrently being considered and assessed as part of a separate Scoping and Environmental Impact Reporting (Scoping & EIR) process.

⁴ . The proposed 132 KV Overhead Powerline to connect to the Eskom grid at a suitable location will be assessed as part of a separate Application for Environmental Authorisation and Basic Assessment process.

The internal road layout is dependent on the PV module layout, however, it is anticipated that a network of gravel internal access roads (each with a width of up to 6m) will be required to access the PV modules for cleaning and maintenance that may be required during operational phase.

It is proposed that cut-off trenches and side drains along roads be constructed to intercept the surface flow and redirect it away from the project infrastructure. In addition, infiltration trenches and retention areas may be required to attenuate the surface flow and recharge groundwater on the project site (BVi, 2021)

4.2 EXTERNAL SERVICES

The following external services will be required for the construction and operation of Khauta North SPV Facility. Further details in this regard will be contained in the Environmental Impact Assessment phase.

4.2.1 SOLID WASTE

It is anticipated that solid waste during the construction phase will mainly be in the form of construction material, excavated substrate and domestic solid waste. All waste will be disposed of in scavenger proof bins and temporarily placed in a central location for removal by the contractor. Any other waste will be removed once construction is complete and disposed of at a registered waste facility. Excess excavation material will either be spoiled offsite at a registered facility or used for landscaping berms within the overall Khauta North SPV Facility footprint. It is proposed that the waste generated on site would be managed by reducing, reusing and recycling as far as possible. Khauta North SPV Facility RF (Pty) Ltd. will appoint an appropriately registered company that will provide the necessary general- and hazardous waste collection services during the construction- and operational phase.

4.2.2 SANITATION

It is expected that during the construction phase, chemical ablution facilities will be utilised. These ablution facilities will be maintained, serviced and emptied by an appointed contractor, who will dispose of the effluent at a licensed facility off site. Once construction is complete, the chemical ablution facilities will be removed from the study area*.

During the operational phase it is foreseen that a conservancy tank or similar will be installed at the Operations and Maintenance building which will be regularly emptied by a registered service provider during the operational phase*.

*It is assumed that infrastructure for the bulk transportation of water, stormwater, sewage, effluent, process water, waste water, return water, industrial discharge or slimes will be less than 1000 meters in length; or, will have an internal diameter of less than 0.36 meters and have a peak throughput of 120 litres per second.

4.2.3 WATER USAGE

Water will be required for the construction of foundations, structures, and internal roads. During operation of the SPV facility, water will also be required for activities such as dust suppression, cleaning, ablutions, and

maintenance activities. Concrete production and module cleaning represent the largest water requirements during the construction and operational phases respectively. *

Water required during the construction- and operation phases will be sourced from the following potential sources (in order of priority):

- The Local Municipality (LM) - Specific arrangements will be agreed on with the Matjhabeng Local Municipality in a Service Level Agreement (SLA). Preliminary, water will either be trucked in, or otherwise made available for collection at their Water Treatment Plant via a metered standpipe.
- Investigation into a third-party water supplier which may include a private services company.
- The investigation of drilling a borehole on site, which includes geohydrological testing and -assessment, a groundwater census and a Water Use License Application (WULA) in terms of section 21(a) of the National Water Act, 1998, for abstraction of water.

Possible sources of this water are to be investigated and the relevant authorities will be approached during the planning stage, concurrent to the EIA process.

*It is assumed that infrastructure for the bulk transportation of water, stormwater, sewage, effluent, process water, waste water, return water, industrial discharge or slimes will be less than 1000 meters in length; or, will have an internal diameter of less than 0.36 meters **and** have a peak throughout of 120 litres per second.

4.2.3.1 WATER USAGE DURING CONSTRUCTION

The following construction activities were identified for needing water:

- Construction of site roads;
- Construction of foundations;
- Substation construction;
- Establishment of the operation- and maintenance buildings;
- Ablution facilities; and,
- Dust suppression.

The water requirement during construction will be largely dependent on the foundation design and the source of water for concrete production. For the development of the 165 MW SPV Facility, the peak water demand during construction is approximately 169 kilolitres (kl) per day (worst case scenario). It should be noted that this is a theoretical amount obtained for a worst-case scenario (i.e. all the construction activities occur at the same time) with concrete manufactured on site for all foundations. It is estimated that approximately 124 Megaliters (Mℓ) of water will be required during a 24-month construction period. In addition, an above-ground water storage tank with the capacity to store 3-4 days (\pm 700 kl) of construction water will likely be required (BVi, 2021).

4.2.3.2 WATER USAGE DURING OPERATIONS

Water will be required for the operational phase for activities such as dust suppression (when and where required), general maintenance, and provisions for permanent staff and visitors. Cleaning of the SPV panels

represents the largest water requirement during the operational phase. For the 165 MW SPV Facility, it is estimated that approximately 206 Mℓ of water will be required over a 25-year operation and maintenance period, and averages a water demand of 8 Mℓ/year.

During the operation of the solar PV plant, the solar PV panels will need to be cleaned routinely as pollen, dust, dirt and bird droppings accumulate and reduce the amount of light reaching the cells. The degree of soiling will be site specific and related to environmental conditions such as dew and humidity, amount and frequency of rainfall as well as the air quality and size of particulate matter in the air. It is anticipated that due to the mining and agricultural activities near the site, the panels will require cleaning multiple times per year. As mentioned, water for cleaning the solar PV modules is the primary contributor to the operational water demand. Panels may be cleaned manually with a squeegee and water or mechanically with a tractor fitted with a cleaning boom. Alternative systems with automated mechanical systems that are integrated into the support structure are also available. The method to be selected will influence the amount of water required, averaging 1 – 3 ℓ/m² (BVi, 2021)

De-ionised water is often recommended for cleaning to prevent the build-up of minerals on the panel surface. In order to reduce water use, anti-soiling coatings are available, which reduce the frequency and/or amount of water required to clean the panels. However, the potential water quality / environmental impact should be assessed.

4.2.3.3 STORM WATER AND DRAINAGE

The proposed site topography is conducive to the development of Solar PV, with no slopes greater than 5%. There are no major watercourses on or near the site, and the risk of a concentrated flood peak is low. Stormwater drainage will, however, be a concern due to the flat terrain and restricted permeability rates anticipated at this site (BVi, 2021).

The soils in this region are described as sandy clay loam and sandy loam, with a moderate stormwater runoff potential. These soils exhibit high erodibility, together with moderate infiltration rates and slightly restricted permeability. The existing grass cover slows the surface flow rate, prevents erosion and facilitates infiltration. Whereas the post-development condition of the site will have impermeable hardened surfaces, which will increase the surface runoff compared to the pre-development condition.

Erosion, including the loss of topsoil, can cause the support structure and solar panels to shift, reducing energy generation. Therefore, erosion control and regular inspections are required throughout the service life (BVi, 2021).

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

4.2.4 ELECTRICITY

During the construction phase of the development, electricity will either be generated on site through a small solar system or through the use of generators or the existing Eskom supply on the farm will be utilised. This will depend on the Engineering, Procurement, and Construction (EPC) contractor appointed.

4.2.5 HAZARDOUS SUBSTANCES

During the construction phase, use of the following hazardous substances is anticipated:

- Cement powder associated with the batching plant;
- Petrol/diesel for trucks/ cranes/ bulldozers/generators;
- Limited amounts of lubricants and transformer oils;
- Defunct or damaged PV modules; and
- Defunct or damaged battery units.

The proposed BESS will contain hazardous substances/toxic chemicals and/or liquid electrolyte which pose a significant environmental risk if leaked. The design of the BESS will take into account potential leaks and equipment will be suitably banded and/or containerised and make provision for secondary containment to accommodate any spill as a result of normal operation and maintenance.

“Dangerous goods” that are likely to be associated with the project include fuel stored during the construction phase and/or hazardous chemical substances at the substation during the operational phase.

Temporary storage and disposal of hazardous waste will be done in compliance with relevant legislation and the EMPr.

4.3 CONSTRUCTION PHASE

4.3.1 CONSTRUCTION PROGRAMME

The construction of the proposed Khauta North SPV Facility will be undertaken in a phased approach. Once the construction has been completed all the temporary site camps and works within the proposed construction laydown area will be removed from the site the BESS will be placed on the construction laydown area.

4.3.2 SURVEYING AND DEMARCATION OF SITE

- Prior to the commencement of road and foundation construction as well as the PV panel structures’ erection, a number of enabling works need to be undertaken. These will include final Engineering design and a geotechnical assessment for the construction works to be undertaken on the site.
- This activity will also include the demarcation of the site and designating the various key construction areas, access roads, site works, site camps and additional areas associated with the construction phase.

4.3.3 CONSTRUCTION OF SITE CAMPS AND LAYDOWN AREAS

- A temporary site camp or construction compound and associated parking area will be set up on the site, comprising an area up to .3.9 Ha. The site camp will be used for the storing of materials and equipment

such as PV modules, rack or tracker components, motors, gears, electrical devices, conduits for wires, transformers, switchgears, prefabricated structures etc., and will also serve as a gathering point for safety talks and will house office facilities for the staff involved in constructing the project.

The site, including the parking

- Part of the site will be graded and used as a construction staging/laydown area.
- Establishment of the laydown area will involve the removal of vegetation and the stripping and stockpiling of topsoil.
- The laydown area will be decommissioned, and all temporary facilities removed when construction is completed, although portions of the area may be retained to provide vehicle parking for maintenance personnel and equipment storage, including the BESS installation.
- The laydown area provision must be made for the following, but not limited to: safe working area, parking excavation and delivery vehicles.

4.3.4 ASSEMBLY AREAS

It is an area proposed for a safe and fast assembly of the racks. Necessary materials are laid out within the assembly area in order to streamline the assembly process. Once the rack is preassembled, a rough terrain vehicle will transport the rack to its final position to finish the process (including, but not limited to tower connection and gear mounting).

4.3.5 SITE CLEARING

- Owing to the relatively open or expansive nature of the PV plant and hence the construction process, no specific service or haul roads are envisaged.
- The proposed site will be sufficiently cleared to allow access for the excavation equipment and the rough terrain vehicles that will deliver the site assembled PV rack or tracker structures to their positions.
- The proposed development footprint portion of the site will be cleared, grubbed and graded by means of the necessary cuts and fills in order to condition the terrain to the maximum slopes allowed for buildings, roads and racks.
- Given the flat nature of the site there is very little cut and fill envisaged.
- Vegetative ground cover reduces dust which influences the PV panel efficiency. The re-growth of the ground cover or rehabilitation is thus important to the PV plant. It thus makes sense to minimise the disruption of the existing vegetative ground cover, however in general the entire site will be trampled and vegetation rehabilitation measures will need to be implemented post-construction.

4.3.6 CONSTRUCTION OF INTERNAL ROADS

- Sufficient space will be allowed at the access point to ensure that the vehicles do not stack up on the road while being processed through security.
- The road alignment and layout will take into account the safety precautions necessary for any road crossings.

- The access and internal roads shall be constructed as all-weather type road with wide, open side drains forming part of the drainage system.
- The road layout will be designed in order to ensure ease of access to every rack or tracker structure and the horizontal geometry will be designed to enable the turning of trucks.
- During the operational phase access around the site is generally only required for security and routine inspection. Access for cleaning operations or maintenance is very infrequent, thus generally the internal service roads need only be gravel tracks.
- The topsoil removed would be stored in accordance with best practice methods, and later used for site restoration. Soils needed for backfill would be stored temporarily adjacent to the excavations until needed. Any remaining excavated material would be recycled to a local site needing clean fill material, or stockpiled for future use.

4.3.7 LABOUR AND WORKFORCE

- It is anticipated that construction personnel and labour would originate from neighbouring towns such as Riebeeckstad, Welkom and Virginia and will be employed during the various stages of the construction phase. This is aimed at temporary job creation in a manner similar to the goals of the extended public works projects that use labour intensive methods where applicable and practical.

4.3.8 TRAFFIC ON AND OFF SITE

- Access to the site shall be gained via farm roads off the R70, R34 and secondary road S173 onto the existing gravel road turning off into the site. This will be the entry point for all workers, construction equipment and PV components for the duration of the construction phase. The impact of the construction trip generation will mostly be temporary and restricted to the construction phase.
- During construction of the internal site roads and PV foundations, there would be an increase in truck traffic on the road leading to and from the project site. Increased dust is possible, although water trucks will continually dampen the roads and excavation areas in order to control dust.

4.3.9 CONSTRUCTION COMPLETION

It is expected that once all the construction, erection, and commissioning are completed and the project is in the start-up phase, all temporary works will be removed and any disturbed areas shall be rehabilitated and restored to the original state.

4.4 OPERATIONAL PHASE

- Once the solar energy facility is operational, there shall very minimal human and vehicle activity required on site.
- The internal site roads will be used for periodic maintenance, panel working and safety checks (including panel cleaning).
- A large notice board or signage board will be located at the entrance to the site. This signage will provide essential safety information such as emergency contacts and telephone numbers.

- Safety signs, such as speed limit and safety information, would also be installed throughout the Project Site. These signs will be maintained throughout the operational life of the solar farm.
- Scheduled maintenance work will be carried out several times each year throughout the operational phase.
- As an example, but not limited to, the following activities could occur in the operational phase:
 - Checking and verifying of the electricity production;
 - Maintaining vegetation height and alien invasive species management
 - Maintaining and monitoring a weather station;
 - Routine inspection of all BESS equipment and systems;
 - Periodic maintenance;
 - Cleaning of PV modules; and
 - Security operations;
- The traffic generated by the PV plant during operation phase once the plant is generating electricity is projected to be minimal.

4.5 DECOMMISSIONING PHASE OR UPGRADE

After the 20 years of operation, the PV plant will either be upgraded if a new license is granted, or the plant will be decommissioned. Upgrading the PV power plant will consist of replacing old PV modules with new modules, increasing the total peak power of the plant (a process called “Repowering”) or increasing the power of the plant by adding new elements such as trackers, PV modules or transformers.

If the plant is to be decommissioned then the site should be returned to as close as possible to its original state. Other than the concrete, all of the components of a PV plant have an intrinsic value either for re-use or recycling.

The decommissioning process will consist of the following steps:

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

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

- Removal of all structures and rubble;
- Breaking up compaction where required, loosening of the soil and the redistribution of topsoil; and,
- Restoration of the surface to the original contours and application of hydro seeding/seeding and/or direct planting (as require).

5 LEGISLATIVE AND POLICY FRAMEWORK

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

The legislation that is relevant to this study is briefly outlined below. These environmental requirements are not intended to be definitive or exhaustive but serve to highlight key environmental legislation and responsibilities only.

5.1 NATIONAL LEGISLATION

5.1.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA (ACT 108 OF 1996)

Administering Authority: National Government

The Constitution of the Republic of South Africa (Act 108 of 1996) states that everyone has a right to a non-threatening environment and that reasonable measures are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development.

The Constitution and Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment.

Section 24 states that “everyone has the right to

an environment that is not harmful to their health or well-being; and
have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -:
prevent pollution and ecological degradation
promote conservation; and
secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development.”

NEMA (discussed below) is the enabling legislation to ensure this primary right is achieved.

5.1.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA) (ACT 107 OF 1998)

Administering Authority: National Department of Forestry, Fisheries and the Environment (DFFE)
Free State Province Department of Economic, Small Business
Development, Tourism and Environmental Affairs (DESTEA)

NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information; polluter pays; subsidiary; waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice.

The mandate for a Scoping & EIR process lays with the NEMA and the EIA Regulations, 2014 (as amended) (GNR 982), and the three (3) Listing Notices (GNR 983, 984 & 985) promulgated in terms of Section 24 of NEMA.

Further to the above, the EIA Regulations in Government Notice No. R. 982 make reference to a schedule of listed activities, which may not commence prior to authorisation. These contemplated listed activities are identified in Government Notices No. R. 983, No. R. 984 and No. R. 985 of 2014, as amended.

The relationship of the listed activities and the EIA processes is as follows:

- All listed activities identified under Government Notices No. R. 983, and No. R. 985 of (Listing Notice 1 and 3), require a Basic Assessment Process to be undertaken as part of the application for authorisation; and
- All listed activities identified under Government Notices No. R. 984 (Listing Notice 2) require Scoping and Environmental Impact Reporting processes to be undertaken as part of the application for authorisation.

With respect to the proposed Khauta North SPV Facility the following table summarises the potential listed activities, which the proposed development is likely to trigger, for which this Scoping Report and Application for Environmental Authorisation has been prepared.

Table 5: Listed Activities Likely to be Triggered by the Khauta North SPV Facility.

GNR (as amended)Activity No(s):	983 Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
Activity No.11:	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	The proposal includes medium voltage (MV) cabling of up to 33/132 Kilovolts (kV) and an onsite substation with a capacity of up to 132 kV.
Activity No.12:	The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more;	The proposed Khauta North SPV Facility could trigger this activity, should access road development and/or expansion

	<p>where such development occurs— within a watercourse; in front of a development setback; or if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</p>	<p>and supporting services infrastructure have a cumulative footprint exceeding 100 square meters within a watercourse or within 32m of a watercourse. The use of existing infrastructure and footprints will be preferred..</p>
Activity No. 19.	<p>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;</p>	<p>Possible infilling and levelling of three small preferential water flow paths/drainage lines present within the central-northern portion of the Khauta North SPV Facility.</p> <p>Possible infilling or deposition of material into or from a watercourse and supporting services infrastructure, however, the use of existing infrastructure and footprints (existing farm roads) will be preferred.</p>
Activity No.24:	<p>The development of a road— 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— (c) which is 1 kilometre or shorter.</p>	<p>The proposed main access road (existing farm road) to Khauta North SPV Facility could be up to 8m wide, but with the inclusion of side drains and gavel embankments, and will thus exceed the threshold of this activity.</p>
Activity No. 28	<p>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: will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;</p>	<p>The proposed Khauta North SPV Facility development is considered to be commercial use and the total footprint size will exceed 1 hectare (ha), on land that was used for agriculture/game farming.</p>
Activity No. 56	<p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre— (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.</p>	<p>The proposed main access road (existing farm road) to Khauta North SPV Facility may potentially be lengthened by more than 1km in order to reach Khauta North SPV Facility. This will occur outside and urban area.</p>
GNR 984 (as amended) Activity No(s):	<p>Provide the relevant Scoping and EIA Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended</p>	<p>Describe the portion of the proposed project to which the applicable listed activity relates.</p>

Activity No. 1:	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more.	The proposed Khauta North SPV Facility will have a generation capacity of up to 165 megawatts (MW).
Activity No. 15:	The clearance of an area of 20 hectares or more of indigenous vegetation.	The proposed Khauta North SPV Facility will require the clearance of an area in excess of 20ha and as such exceeds the threshold of this activity. In order to accommodate the BESS and to remove potential fire hazards, approximately 4 ha of natural vegetation will be cleared.
Activity No(s): GNR 985 (as amended)	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
Activity No. 2.	The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres. b. Free State Outside urban areas: (ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;	Above-ground water storage tank with a capacity to store 3-4 days ($\pm 700 \text{ m}^3$) of construction water will likely be required.
Activity No. 4.	The development of a road wider than 4 metres with a reserve less than 13,5 metres. b. Free State (i) Outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve, excluding disturbed areas;	This activity may be applicable pending the final design considerations for the layout of project infrastructure and main access road.
Activity No. 10.	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage	"Dangerous goods" that are likely to be associated with the project include fuel stored during the construction phase

	<p>occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</p> <p>b. Free State</p> <p>Outside urban areas:</p> <p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve, excluding disturbed areas.</p>	<p>and/or hazardous chemical substances at the substation during the operational phase. Threshold of 80 m³ expected to be exceeded.</p> <p>The proposed BESS will contain hazardous substances/toxic chemicals and/or liquid electrolyte which pose an environmental risk if leaked. The design of the BESS will take into account potential leaks and equipment will be suitably banded and/or containerised and make provision for secondary containment to accommodate any spill as a result of normal operation and maintenance.</p>
<p>Activity No. 12.</p>	<p>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.</p> <p>b. Free State</p> <p>(ii) Within critical biodiversity areas identified in bioregional plans;</p> <p>(iv) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland.</p>	<p>This activity may be applicable pending the final design considerations for the layout of project infrastructure and main access road.</p>
<p>Activity No. 14.</p>	<p>The development of— infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs—</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>b. Free State</p> <p>(i) Outside urban areas:</p> <p>(ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected</p>	<p>This activity may be applicable pending the final design considerations for the layout of project infrastructure and main access road.</p>

	<p>area identified in terms of NEMPAA or from the core area of a biosphere reserve;</p> <p>(hh) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland;</p>	
Activity No. 18	<p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p>b. Free State</p> <p>(ii) Outside urban areas:</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve, excluding disturbed areas;</p> <p>(hh) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland;</p>	<p>This activity may be applicable pending the final design considerations for the layout of project infrastructure and main access road.</p>

NOTE: Basic Assessment as well as a full Environmental Impact Assessment are triggered by the proposed development activities and as such, the Environmental Process will follow a Scoping and Environmental Impact Reporting process (Figure 3).

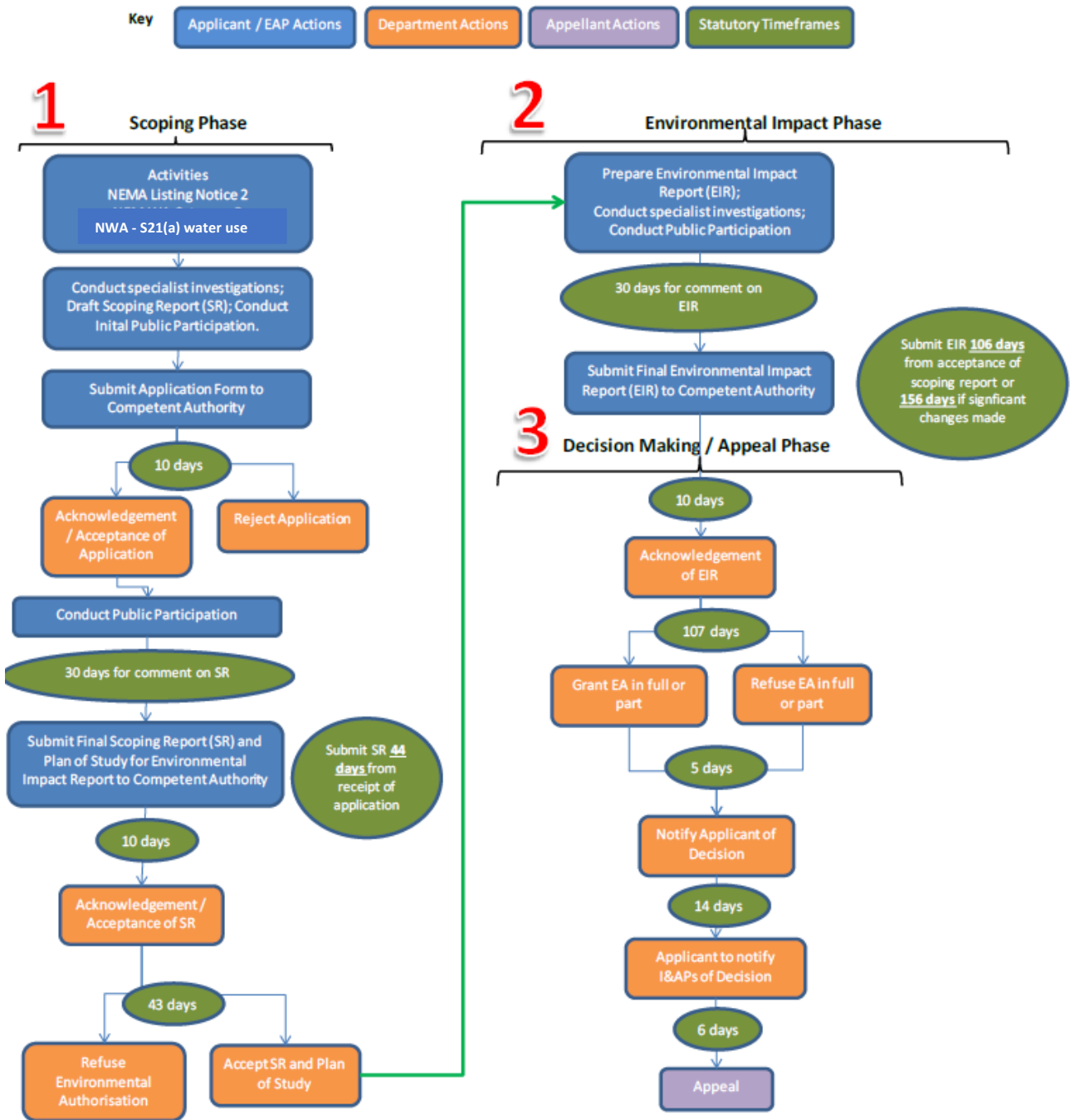


Figure 11: OUTLINE OF THE SCOPING & EIR PROCESS IN TERMS OF THE EIA REGULATIONS, 2014 (AS AMENDED).

It must be noted that the potential listed activities in Table 2 are all to be considered at the scoping phase, but certain of the activities listed may no longer be relevant or additional activities may be relevant after the outcome of the specialist studies. In this case, the activities forming part of the application may be amended.

The EIA will be undertaken in accordance with the Environmental Impact Assessment Regulations, 2014 (as amended), published in the Government Gazette in terms of Section 24 (5) of NEMA as well as relevant regulations, legislation and guidelines mentioned above.

5.1.3 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT (NEMBA) (ACT 10 OF 2004)

Administering Authority: National Department of Forestry, Fisheries and the Environment (DFFE)

The National Environmental Management Biodiversity Act (NEMBA) provides for listing of threatened or protected ecosystems, in one of four categories: **critically endangered** (CR), **endangered** (EN), **vulnerable** (VU) or **protected**. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction and to preserve witness sites of exceptionally high conservation value. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems.

In terms of the EIA Regulations, 2014 (as amended) a basic assessment is required for the transformation or removal of indigenous vegetation in a critically endangered or endangered ecosystem if more than 300 square metres are transformed.

The development footprint falls within the Highveld Alluvial Vegetation unit, classified as Least Threatened (SANBI, 2006-2019)⁵. The Endangered vegetation unit (the Vaal-Vet Sandy Grassland unit) is located approximately 1 km east from the project site.

5.1.4 NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT (NEMPAA) (ACT 57 OF 2003)

Administering Authority: National Department of Forestry, Fisheries and the Environment (DFFE)

The National Environmental Management: Protected Areas (NEMPAA) intends to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. It furthermore provides for the establishment of a national register of all national, provincial and local protected areas.

The Khauta North SPV Facility is located within 10 kilometres from nature reserves designated as protected areas in terms of NEMPAA. Buffers around protected areas are drawn at distances as defined in Listing Notice 3 of the EIA Regulations, 2014 (as amended). The activities likely to be triggered in Listing Notice 3 are applied for and included in Table 2 – section 5.1.2. . Part of the assessment in the EIA phase will include an overview of the functionality of the declared reserve i.e. does it still serve as a biodiversity conservation area or is it disturbed and non-functional as an ecosystem preserve.

⁵ National list of ecosystems that are threatened and in need of protection, (G 34809, GN 1002) of 9 December 2011

5.1.5 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT (NEMWA) (ACT 59 OF 2008)

Administering Authority:	Hazardous Waste:	DFFE
	General Waste:	DESTEA

The National Environmental Management: Waste Act (NEMWA) came into effect on 1 July 2009. Section 19 of the NEMWA provides for listed waste management activities and states in Section 19(1) that the Minister may publish a list of waste management activities that have or are likely to have a detrimental effect on the environment. Such a list was published in GN 921 of 29 November 2013 (as amended), identifying those waste management activities that require a Waste Management Licence in terms of the Act. Activities are defined within Category A, Category B and Category C.

Some key definitions from this Act include:

"Disposal" – the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.

"General waste" means waste that does not pose an immediate hazard or threat to health or to the environment, and includes –

domestic waste;

building and demolition waste;

business waste: and

inert waste;

"Hazardous waste" – any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

"Storage" – the accumulation of waste in a manner that does not constitute treatment or disposal of that waste.

"Waste" – any substance, whether or not that substance can be reduced, re-used, recycled and recovered –

That is surplus, unwanted, rejected, discarded, abandoned or disposed of;

Which the generator has no further use of for (the purposes of production);

That must be treated or disposed of; or

That is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but –

A by-product is not considered waste; and

Any portion of waste, once re-used, recycled and recovered, ceases to be waste.

No authorisation will be required in terms of activities defined within Category A and Category B.

The National Norms and Standards (activities listed in Category C) are noted with regards to waste management during construction and operation::

National norms and standards for the storage of waste (GN. R 926 of 2013);
 Waste Classification and Management Regulations (GN. R 634 of 2013);
 National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN. R 635 of 2013);
 and
 National Norms and Standards for the Disposal of Waste to Landfill (GN. R 636 of 2013 of 2013).

5.1.6 NATIONAL FORESTS ACT (ACT 84 OF 1998)

Administering Authority: National Department of Forestry, Fisheries and the Environment
 (DFFE)

The National Forests Act provides for the protection of forests as well as specific tree species, quoting directly from the Act: *“no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated”*.

A terrestrial biodiversity survey will be undertaken the during the Environmental Impact Assessment phase. This is also a requirement from the Screening Report.

5.1.7 FENCING ACT (ACT 31 OF 1963)

Any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5 metres on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to the protection of flora.

5.1.8 CONSERVATION OF AGRICULTURAL RESOURCES ACT (CARA) (ACT 43 OF 1983)

Administering Authority: National Department of Agriculture, Land Reform and Rural
 Development (DALRRD)
 National Department of Agriculture (DoA)

The mandate of the Conservation and Agricultural Resources Act (CARA) is to conserve “natural agricultural resources” (the soil, the water sources and the vegetation, excluding weeds and invader plants) through production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants.

Section 6 of the Act concerns the control measures which the following may be applicable to IPPs (subsections (2) (f), (g) and (o)):

- the regulating of the flow pattern of run-off water;
- the utilization and protection of the vegetation; and
- the construction, maintenance, alteration or removal of soil conservation works or other structures on land.

Regulation 8 regulating the flow pattern of run-off water states that no land user shall in any manner whatsoever divert any run-off water from a water course on his farm unit to any other water course, except on authority of a written permission by the executive officer. No land user shall effect an obstruction that will disturb the natural flow pattern of run-off water on his farm unit or permit the creation of such obstruction unless the provision for the collection, passing through and flowing away of run-off water through, around or along that obstruction is sufficient to ensure that it will not be a cause for excessive soil loss due to erosion through the action of water or the deterioration of the natural agricultural resources.

The use of agricultural land for energy generation will need to be well motivated to the Department of Agriculture, since according to the Department, good productive agricultural land is in short supply in South Africa. The Department of Agriculture's Guideline Document excludes areas of high agricultural potential from being developed for wind generation energy purposes (and it is presumed that the same will apply for solar energy developments).

An agricultural assessment (as required by the Screening Report) shall be undertaken to determine the agricultural potential of the site in support of the following:

Application for the change in land use to the Deputy Director General (Agricultural Production, Health and Food Safety, Natural Resources and Disaster Management)

Consent for the long-term lease in terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA)

5.1.9 NATIONAL HERITAGE RESOURCES ACT (NHRA) (ACT 25 OF 1999)

Administering Authority: South African National Heritage Resources Agency (SAHRA)
Free State Heritage Resources Authority (FSHRA)

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (NHRA). The South African National Heritage Resources Agency (SAHRA) and the provincial heritage resources agency in the Free State Province (FSHRA), is registered as a Stakeholder for this environmental process.

In terms of Section 38 of the NHRA, the Heritage Resources Agency will comment on the detailed Heritage Impact Assessment (HIA) where certain categories of development are proposed. Section 38(8) also makes provision for the assessment of heritage impacts as part of an EIA process.

The NHRA requires relevant authorities to be notified regarding this proposed development, as the following activities are relevant:

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- any development or other activity which will change the character of a site exceeding 5 000 m² in extent;
- the re-zoning of a site exceeding 10 000m² in extent.

Furthermore, in terms of Section 34(1), no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the SAHRA, or the responsible resources authority.

Nor may anyone destroy, damage, alter, exhume or remove from its original position, or otherwise disturb, any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority, without a permit issued by the SAHRA, or a provincial heritage authority, in terms of Section 36(3).

In terms of Section 35(4), no person may destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object, without a permit issued by the SAHRA, or the responsible resources authority.

An Archaeological Heritage and Paleontological Impact Assessment (as required by the Screening Report) shall be undertaken during the EIA phase. These assessment reports will be submitted to SAHRA and FSHRA simultaneously with this draft SR for input and guidance on further requirements.

5.1.10 NATIONAL WATER ACT (NWA) (ACT 36 OF 1998)

Administering Authority: Department of Water and Sanitation (DWS)

The National Water Act (NWA) administered by the DWS aims to manage and protect the national water resources to achieve sustainable use of water for the benefit of all water users.

Section 21(c) & (i) of the NWA requires the Applicant to apply for authorisation from the DWS regional office for an activity in, or in close proximity to any watercourse (i.e., within the regulated area of a watercourse). Such an application would be required for any access road or PV infrastructure that crosses any watercourse or fall within the regulated area of a watercourse.

Section 21(a) of the National Water Act is related to the abstraction of water from a water resource (including abstraction of groundwater).

In future, should the project consider abstraction from a water resource for the purposes of construction or operation of the solar PV facility, such abstraction will require a Water Use License in terms of Section 21(a) of the NWA.

In addition, should a conservancy tank be required for the purposes of construction or operations, the requirement might potentially trigger a section 21(g) water use (i.e. disposal of effluent into a water containment facility) in terms of the NWA.

DWS is registered as a key stakeholder in this environmental process. The water use applicability will be confirmed with DWS and a WULA will be applied for where necessary and applicable.

5.1.11 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (MPRDA) (ACT 28 OF 2002)

Administering Authority: Department of Mineral Resources and Energy (DMRE)

This act makes provisions for equitable access to and sustainable development of South Africa's mineral and petroleum resources.

Section 53 (1) stipulates that Subject to subsection (2), any person who intends to use the surface of any land in any way which may be contrary to any object of this Act or which is likely to impede any such object must apply to the Minister for approval in the prescribed manner.

A Section 53 application will be submitted to DMRE for approval of the sterilisation of mineral resources in terms of the proposed change in land-use which will prevent the extraction of mineral resources during the life of the project.

5.1.12 THE HAZARDOUS SUBSTANCES ACT (HSA) (ACT 15 OF 1973)

The Hazardous Substances Act (HSA) was promulgated to provide for the control of substances which may cause injury, ill-health or death. Substances are defined as hazardous if their inherent nature is: toxic, corrosive, irritant; strongly sensitising, flammable and pressure generating (under certain circumstances) which may injure cause ill-health, or death in humans. HSA is administered by the department of health in consultation with other departments.

The HSA also provides for matters concerning the division of such substances or products into four groups in relation to the degree of danger, the prohibition and control of the importation, manufacture, sale, use, operation, application and disposal of such substances.

- Group 1 substances include all hazardous substances (as defined above);

- Group 2 substances include mixtures of Group 1 substances;
- Group 3 substances include substances found in certain electronic products (i.e. product with an electronic circuit); and
- Group 4 substances include all radioactive substances.

Noted with regards to the proposed BESS and storage of dangerous goods during the Project Life Cycle.

5.1.13 ASTRONOMY GEOGRAPHIC ADVANTAGE ACT (ACT 21 OF 2007)

Administering Authority: South African Radio Astronomy Observatory (SARAO)
Square Kilometre Array (SKA) South Africa

The purpose of the Act is to preserve the geographic advantage areas that attract investment in astronomy. The entire Northern Cape Province, excluding the Tsantsabane Municipality, has been declared an astronomy advantage area. The Northern Cape optical and radio telescope sites were declared core astronomy advantage areas. The Act allowed for the declaration of the Southern Africa Large Telescope (SALT), Meerkat and Square Kilometre Array (SKA) as astronomy and related scientific endeavours that has to be protected.

The closest SKA station has been identified as Rem-Opt-11, at approximately 262 km from the proposed solar PV facility. Based on the distance to the nearest SKA station, the facility is considered to poses a low risk of detrimental impact on the SKA. The SKA Project Office and SARAO is registered as stakeholders in this environmental process and will be given the opportunity to provide comments and/or input during the Public Participation Process.

5.1.14 NATIONAL ENERGY ACT (ACT 34 OF 2008)

Administering Authority: Department of Mineral Resources and Energy (DMRE)

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

5.1.15 MUNICIPAL SYSTEMS ACT (MSA) (ACT 32 OF 2000)

Administering Authority: Matjhabeng Local Municipality
Lejweleputswa District Municipality

The Municipal Systems Act (MSA) concerns itself with the internal systems and administration of municipalities. The Act requires that the Constitution and other national level acts (e.g. NEMA) be incorporated into strategic planning at a municipal level. The Competent Authority (CA) responsible for administering the MSA is dependent on the municipality in which the activity is taking place.

Development at a local level is the primary focus as the act separates the responsibility of a service authority with that of a service provider; sets out the roles of officials and councillors, and provides for a range of requirements; including IDPs, performance management and tariff setting.

The Act accordingly regulates municipal service delivery and provides a comprehensive range of service delivery mechanisms through which municipalities may provide municipal services. It explains the process to be applied and the criteria to be considered in reviewing and selecting municipal service delivery mechanisms. Under the Act, every municipal council must adopt a single, inclusive and strategic plan (i.e. IDP) for the development of the municipality which amongst others:

- links, integrates and co-ordinates plans and takes into account proposals for the development of the municipality; and
- aligns the resources and capacity of the municipality with the implementation of the plan;

At a municipal level, these plans may call for the implementation of renewable energy projects and should be referenced in applications to motivate for relevant environmental authorisations.

IPPs will consult with the various relevant municipal authorities and development plans as applicable to the proposed Khauta North SPV Facility. The Matjhabeng Local Municipality and Lejweleputswa District Municipality are registered as a key stakeholder in this environmental process and are referenced in the application for environmental authorisation.

5.1.16 NATIONAL INFRASTRUCTURE PLAN

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

As part of the National Infrastructure Plan, Cabinet established the Presidential Infrastructure Coordinating Committee (PICC). The Committee identified and developed 18 strategic integrated projects (SIPs). The SIPs cover social and economic infrastructure across all nine provinces (with an emphasis on lagging regions). The proposed project is aligned to at least three SIP's

The three energy SIPs are SIP 8, 9 and 10 as described below:

SIP 8: Green energy in support of the South African economy

- Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010).

- Support bio-fuel production facilities.

SIP 9: Electricity generation to support socio-economic development

- Accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances.
- Monitor implementation of major projects such as new power stations: Medupi, Kusile and Ingula.

SIP 10: Electricity transmission and distribution for all

- Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development.
- Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity.

5.1.17 WHITE PAPER ON THE ENERGY POLICY OF THE REPUBLIC OF SOUTH AFRICA

Investment in renewable energy initiatives, such as the proposed *Khauta North SPV Facility*, is supported by the White Paper on Energy Policy for South Africa (December 1998). In this regard, the document notes:

- “Government policy is based on an understanding that renewables are energy sources in their own right, are not limited to small-scale and remote applications, and have significant medium and long-term commercial potential”.
- “Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future”.

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

5.1.18 WHITE PAPER ON RENEWABLE ENERGY

The White Paper on Renewable Energy (November 2003) (further referred to as the White Paper) supplements the White Paper on Energy Policy, which recognizes that the medium and long-term potential of renewable energy is significant. This Paper sets out Government’s vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.

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

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

long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidised alternative to fossil fuels.

5.1.19 INTEGRATED ENERGY PLAN (2016)

The IEP notes that a diversified energy mix with a reduced reliance on a single or a few primary energy sources should be pursued. In terms of renewable energy, wind and solar are identified as the key options.

With reference to the Renewable Energy Independent Power Producer (REIPP) Procurement Programme, the IEP notes:

- The REIPP Procurement Programme should be extended, and new capacity should be allocated through additional bidding windows in order ensure the ongoing deployment of renewable energy technologies.
- Experience and insights gained from the current procurement process should be used to streamline and simplify the process.

The implementation of REIPP projects in subsequent cycles of the programme should be aligned with the spatial priorities of provincial and local government structures in the regions that are selected for implementation, in line with the Spatial Development Frameworks. This will ensure that there is long-term, sustainable infrastructure investment in the areas where REIPP projects are located. Such infrastructure includes bulk infrastructure and associated social infrastructure (e.g., education and health systems). This alignment will further assist in supporting the sustainable development objectives of provincial and local government by benefiting local communities.

5.1.20 INTEGRATED RESOURCE PLAN

In terms of renewable energy four bidding rounds have been completed for renewable energy projects under the RE IPP Procurement Programme. The most dominant technology in the IRP2019 is renewable energy from wind and solar PV technologies, with wind being identified as the stronger of the two technologies. There is a consistent annual allocation of 1 600MW for wind technology commencing in the year 2022 up to 2030. The solar PV allocation of 1 000MWs per year is incremental over the period up to 2030, with no allocation in the years 2024 (being the year the Koeberg nuclear extension is expected to be commissioned) and the years 2026 and 2027 (presumably since 2 000MW of gas is expected in the year 2027). The IRP 2019 states that although there are annual build limits, in the long run such limits will be reviewed to take into account demand and supply requirements.

5.1.21 NATIONAL DEVELOPMENT PLAN

The National Development Plan (NDP) contains a plan aimed at eliminating poverty and reducing inequality by 2030 making this one of the guiding objectives of the NDP over the next 20 years. The NDP identifies 9 key challenges and associated remedial plans. Managing the transition towards a low carbon national economy is

identified as one of the 9 key national challenges. Expansion and acceleration of commercial renewable energy is identified as a key intervention strategy.

5.1.22 THE NEW GROWTH PATH FRAMEWORK

The aim of the New Economic Growth Path Framework is to enhance growth, employment creation and equity. 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.

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

5.1.23 DFFE SCREENING TOOL AND PROTOCOLS

Administering Authority: National Department of Forestry, Fisheries and the Environment (DFFE)

The DFFE Screening Tool (Appendix B) was generated for the proposed Khauta North SPV Facility and used to determine various theme sensitivities (Table 3), in terms of sections 24(5)(a) and (h) and 44 of the NEMA, within the development footprint. Based on protocols (as stipulated in Government Notices no. 43110 and no. 42946), the level (Low, Medium, High, or Very high) of these sensitivities needs to be confirmed or disputed by a site verification.

Following the site verification, a Compliance Statement or a Full Impact Assessment by a specialist needs to be compiled based on the sensitivity level of each theme. Where the protocols were not followed i.e. a Compliance Statement or Full Impact Assessment was not done, valid and detailed reasons, based on the site verification, need to be outlined.

In addition to the theme sensitivities, the required specialist studies are also identified by the DFFE Screening Tool. The need for a specialist study is dependent on whether the sensitivity of the respective theme has been confirmed or disputed with a site verification. Where a specialist study has not been conducted as suggested by the DFFE Screening Tool, a motivation to exclude the study needs to be outlined with reference to the site verification.

The environmental sensitivities as well as the level of study required by the DFFE Screening Tool protocols, are summarised in the table below.

Table 6: Sensitivity of the Environmental Themes and Studies to be Undertake in terms of these Sensitivities

ENVIRONMENTAL THEME	SENSITIVITY	REQUIRED INVESTIGATION	DISCUSSION / COMPLIANCE
Agriculture Theme	High	Agricultural Compliance Statement	An Agricultural Compliance Statement shall be submitted as part of the EIA process as outlined in the Plan of Study for EIA.
Animal Species Theme	Low	Terrestrial Animal Species Compliance Statement	A Terrestrial Animal Species Compliance Statement will be submitted as part of the EIA process as outlined in the Plan of Study for EIA.
Aquatic Biodiversity Theme	Low	Aquatic Biodiversity Compliance Statement	An Aquatic Biodiversity Compliance Statement will be submitted as part of the EIA process as outlined in the Plan of Study for EIA.
Archaeological and Cultural Heritage Theme	Low	Archaeological Heritage Impact Assessment	An Archaeological Heritage Impact Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA
Avian Theme	Low	Avifaunal Impact Assessment	Although assigned a low sensitivity for SPV developments, an Avifaunal Impact Assessment will be undertaken as part of the EIA phase, due to the surrounding water resources and potential flight collision risks in terms of the proposed 32/44 kV and 33/132kV transmission lines.
Civil Aviation (Solar PV) Theme	Low	No investigation required.	No significant impacts on the civil aviation installation are expected in low sensitivity areas. It is unlikely for further assessment and mitigation measures to be required.
Defence Theme	Low	No investigation required.	No negative impacts on the defence installation are expected in low sensitivity areas. It is unlikely for further assessment and mitigation measures to be required.
Landscape (Solar) Theme	Very High	Specialist assessment	A Visual Impact Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA.
Paleontology Theme	High	Specialist assessment	Will form part of the Archaeological Heritage Impact Assessment that will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA
Plant Species Theme	Low	Terrestrial Plant Species Compliance Statement	A Terrestrial Plant Species Compliance Statement shall be submitted as part of the

ENVIRONMENTAL THEME	SENSITIVITY	REQUIRED INVESTIGATION	DISCUSSION / COMPLIANCE
			EIA process as outlined in the Plan of Study for EIA
RFI Theme	Low	Compliance Statement	Not to be undertaken – The SKA declared area is approximately 262 km southwest of the project site. Considering the distance, the project is unlikely to have any impact on the SKA. The South African SKA Project Office and SARAo have been registered as a key stakeholder on this environmental process and will be given the opportunity to provide comments and input in terms of the Astronomy Geographic Advantage Act and potential impact to SKA.
Terrestrial Biodiversity Theme	Very High	Terrestrial Biodiversity Specialist Assessment	A Terrestrial Biodiversity Specialist Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA.
Geotechnical Assessment	To be confirmed	Specialist assessment	A Geotechnical Assessment was undertaken as part of the preliminary engineering study (referrer to Appendix D). Detailed investigations will be done at detailed design stage.
Socio-Economic Assessment	To be confirmed	Specialist assessment	A Socio-Economic Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA.

5.2 PROVINCIAL LEGISLATION

This section deals with provincially promulgated or provincially applicable legislation associated with the proposed Khauta North SPV Facility.

5.2.1 FREE STATE SPATIAL DEVELOPMENT FRAMEWORK (2014)

The Free State Provincial Spatial Development Framework (PSDF) is a provincial spatial plan and strategic planning policy which addresses and adheres to all relevant policies and legislation. The PSDF aims to address the key challenges facing the Free State of needing to implement a 'developmental state' while ensuring global obligations to social, economic and environmental sustainability are achieved. The Free State PSDF supplements the Free State Growth Development Strategy (FSGDS). Together they provide a crucial tool for guiding the use of the provinces resources in a way that ensures the provinces development needs and priorities are met while remaining sustainable.

Agriculture is a key economic driver within the Free State and areas of high agricultural potential need to be protected from non-agricultural activities and used appropriately. Where agricultural land is to be used for other activities, such as mining, the activities must result in meaningful benefit. With regards to industrial activities, the PSDF aims to ensure that any use of the province's resources results in meaningful and lasting benefits for the people of the province and the environment.

Renewable energy is noted as a key focus in the PDSF, with the goal of renewable energy sources, including solar, comprising 25% of the province's energy generation capacity by 2020.

5.2.2 FREE STATE PROVINCIAL SPATIAL BIODIVERSITY PLAN

The Free State Provincial Spatial Biodiversity Plan (2018) provides a map of the terrestrial Critical Biodiversity Areas only. The inclusion of the aquatic component was limited to the Freshwater Ecosystem Priority Areas (FEPA) catchments (included in the cost layer and for the identification of Ecological Support Areas (ESAs)) and wetland clusters (included in the ESAs only).

In terms of the preliminary layout plan for the solar PV facility, all watercourses surrounding the development footprint, will be considered to be ecologically significant and will be delineated and buffers will be assigned as no-go areas. This would be especially significant for ESA 1 and 2 areas on the site to preserve the NFEPA wetland clusters and to prevent sedimentation (i.e., reduction of water quality) into the wetlands. This will aim to retain the functionality of the ESAs.

In addition to the above-mentioned, the plant species assessment will take into consideration any identified species listed and categorised as per the Red Data Species List; Protected Species List of the National Forests Act (Act No. 84 of 1998), Invasive Species List of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004), Alien and Invasive Species Regulations, 2014 as well as the Provincially Protected species of the Free State's Nature Conservation Ordinance (No 8 of 1969).

5.3 GUIDELINES, POLICIES AND AUTHORITATIVE REPORTS

5.3.1 LEJWELEPUTSWA DISTRICT MUNICIPALITY: INTEGRATED DEVELOPMENT PLAN (IDP) 2017-2022

One of the strategic objectives noted in the Lejweleputswa District Municipality IDP is the reduction of greenhouse emissions in the district, through the development of solar power plant. The solar energy projects at Dealesville and Boshof have been identified as projects to be expanded into a solar energy hub for the southwestern part of the Lejweleputswa district.

The district has seen retrenchments in the mining industry, particularly affecting the mining towns of Virginia, Welkom, Odendaalsrus and Allanridge. Welkom is an economic node within the district and is expected to remain so despite a decline in the gold mining industry of the Welkom area. Welkom serves as a main service centre within the district, providing specialised services including a hospital, institutions, regional government representation, regional banking institutions, specialised commercial and industries.

5.3.2 MATJHABENG LOCAL MUNICIPALITY: INTEGRATED DEVELOPMENT PLAN FOR THE FINANCIAL YEAR 2017 – 2022.

It is noted that the Matjhabeng area has a well-established bulk electrical network. Eskom serves the mines and townships in the municipal area and thus there is sufficient bulk infrastructure available to serve the whole area. The municipality however faces the challenge of aging electrical infrastructure. Several proposed projects for the upgrading of electrical infrastructure are included in the IDP. It is noted that Matjhabeng Municipality are endeavouring to reduce their carbon footprint and move to towards green economy.

Based on the Matjhabeng Local Municipality Spatial Development Framework (2013), there are no development proposals for the project area. Long-term urban development (proposed roads) is planned to the west of Road R34. At a municipal level, the IPP will need to consult with the various relevant municipal authorities and development plans as applicable to the specific project design and location.

5.3.3 EIA GUIDELINE FOR RENEWABLE ENERGY PROJECTS

The Minister of Environmental Affairs published the Environmental Impact Assessment Guideline for Renewable Energy in terms of section 24J of the NEMA on 16 October 2016.

In pursuit of promoting the country's Renewable Energy development imperatives, the Government has been actively encouraging the role of Independent Power Producers (IPPs) to feed into the national grid. Through its REIPPPP, the DoE has been engaging with the sector in order to strengthen the role of IPPs in renewable energy development. Launched during 2011, the IPPs Procurement Programme is designed so as to contribute towards a target of 3 725MW, and towards socio-economic and environmentally sustainable development, as well as to further stimulate the renewable industry in South Africa.

The table below (table 4) indicates the potential impacts associated with the full range of solar energy project development, together with the applicable and relevant legislation. It is stipulated that these are (under normal circumstances) the main impacts, but other impacts maybe relevant depending on project specifics.

Table 7 Potential environmental impacts of solar energy projects

Impact Description	Relevant Legislation
Visual Impact	NEMA
Land Use Transformation (fuel growth and production)	NEMA, NEMPAA, NHRA
Impacts on Cultural Heritage	NEMA, NHRA
Impacts on Biodiversity	NEMA, NEMBA, NEMPAA, NFA
Impacts on Water Resources	NEMA, NEMICMA, NWA, WSA
Hazardous Waste Generation	NEMA, NEMWA, HSA
Electromagnetic Interference	NEMA
Aircraft Interference	NEMA, MSA
Loss of Agricultural Land	SALA
Sterilization of Mineral Resources	MPRDA

Assuming an IPP project triggers the need for a Scoping & EIR process under the EIA Regulations, 2014 (as amended), included in the assessment process is the preparation of an environmental management programme

(EMPr). Project-specific measures designed to mitigate negative impacts and enhance positive impacts should be informed by good industry practice and are to be included in the EMPr.

Potential measures for solar energy projects include but are not limited to:

- Conduct pre-disturbance surveys as appropriate to assess the presence of sensitive areas, fauna, flora and sensitive habitats;
- Plan visual impact reduction measures such as natural (vegetation and topography) and engineered (berms, fences, and shades, etc.) screens and buffers;
- Utilise existing roads and servitudes as much as possible to minimise project footprint;
- Site projects to avoid construction too near to pristine natural areas and communities;
- Locate developments away from important habitat for faunal species, particularly species which are threatened or have restricted ranges, and are collision-prone or vulnerable to disturbance, displacement and/or habitat loss;
- Fence sites as appropriate to ensure safe restricted access;
- Ensure dust abatement measures are in place during- and post-construction;
- Develop and implement a storm water management plan;
- Develop and implement a waste management plan; and,
- Re-vegetation with appropriate indigenous species to prevent dust and erosion, as well as establishment of alien species.

5.3.4 SUSTAINABILITY IMPERATIVE

The following guideline documents were considered amongst others:

- DEAT (2005) Guideline 3: General Guide to Environmental Impact assessment Regulations 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.
- DEAT (2005) Guideline 4: Public Participation, in support of the EIA Regulations 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.
- DEAT (2006) Guideline 5: Assessment of Alternatives and Impacts in support of the Environmental Impact Assessment Regulations 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.
- Integrated Environmental Management (IEM) Guidelines.

Changes to these guidelines following the amendments to NEMA and the EIA Regulations have been considered.

The general approach to this study has been guided by the principles of Integrated Environmental Management (IEM) and the **EIA Guideline for Renewable Energy Projects (DEA, 2013)** to assist project planning, financing, permitting, and implementation for both developers and regulators, in order to promote efficient, effective, and expedited authorisation processes. Wherefore, IEM is a procedure for ensuring that environmental

considerations are fully integrated into all stages of the development process. This philosophy aims to achieve a desirable balance between conservation and development (DEAT, 1992). The IEM guidelines intend encouraging a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels.

Further to the above guidelines, other best practice guideline documents from other provinces and also international sources have been used in the scoping process and will also be used in the EIA phase to be undertaken. Among these guidelines are those developed by the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP)⁶, which include:

- Guideline for Determining the Scope of Specialist Involvement in EIA Processes;
 - Guideline for the Review of Specialist Input into the EIA Process;
 - Guideline for Involving Biodiversity Specialists in EIA Processes;
 - Guideline for Involving Heritage Specialists in EIA Processes;
 - Guideline for Involving Visual and Aesthetic Specialists in EIA Processes;
 - Guideline for Involving Economists in EIA Processes;
 - Guideline for Involving Hydro Geologists in EIA Processes;
 - Guideline for Environmental Management Plans;
 - Guideline for Involving Social Assessment Specialists in EIA Processes; and,
 - Guideline on Need and Desirability
- International Guidelines used include:
- Guidelines for Landscape and Visual Impact Assessment (The Landscape Institute and the Institute of Environmental Management and Assessment, 2002).

The EAP and the specialists involved with the proposed Solar Energy Facility have and shall ensure these guidelines are used and implemented where applicable and appropriate.

5.4 POLICY ON RENEWABLE ENERGY

The White Paper on Renewable Energy supplements the government's overarching policy on energy as set out in its White Paper on the Energy Policy of the Republic of South Africa (DME, 1998), which pledges '*Government support for the development, demonstration and implementation of renewable energy sources for both small and large-scale applications*'.⁷

The Government's overall vision for the role of renewable energy in its energy economy is:

- An energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation.

⁶ The Western Cape Provincial guidelines were considered in the absence of Free State Province Guidelines.

⁷ The Department of Minerals and Energy. *White Paper on Renewable Energy*. November 2003

The purpose of this White Paper is to set out government's principles, goals and objectives for renewable energy. It furthermore commits government to a number of enabling actions to ensure that renewable energy becomes a significant part of its energy portfolio over the next ten years.

With an increasing demand in energy predicted and growing environmental concerns about fossil fuel based energy systems, the development of large-scale renewable energy supply schemes is strategically important for increasing the diversity of domestic energy supplies and avoiding energy imports while minimising the environmental impacts.

6 PROJECT NEED AND DESIRABILITY

The Department of Environmental Affairs' updated Need and Desirability Guideline Document (2017) were referenced to provide the following estimation of the activity in relation to the broader societal needs. The concept of need and desirability can be explained in terms of its two components, where need refers to *time*, and *desirability* refers to *place* (i.e. is this the right time and is it the right place for locating the type of land-use/activity being proposed?).

The overall need for alternative, so-called 'green energy' in light of the known environmental burdens associated with the impact of coal power generation through which most of our country's electricity is currently being generated. Associated aspects such as air pollution, water use and carbon tax are discussed in order to further explain the need and desirability for 'green energy' projects in general. This section provides an overview need and desirability of the proposed Khauta North SPV Facility. This will be expanded upon once the relevant specialists (most notably the socio-economic specialist) complete their impact assessments.

6.1 FEASIBILITY CONSIDERATION

The commercial feasibility for the proposed 165 MW Khauta North SPV Facility to be built on private land near Welkom, has been informed by its contextual location, and economic, social and environmental impacts and influence. The project has gathered sufficient information and once specialist assessments are completed in the EIA phase, the EAP will be able to make qualified and reliable assumptions on the project's various impacts.

6.1.1 SOLAR RESOURCE AND ENERGY PRODUCTION

The economic viability of a solar PV facility is directly dependent on the annual solar irradiation at the site. From a regional site selection perspective, this region is considered to be preferred for solar energy development by virtue of its annual solar irradiation values. The Global Horizontal Irradiation (GHI) for the area derived from the World Bank Group's Global Solar Atlas is approximately 2 128 kWh/m²/annum.

6.1.2 SOLAR FARM & GRID CONNECTION

Ease of access into the Eskom electricity grid is vital to the viability of a solar PV facility. Projects which are in close proximity to a connection point and/or demand centre are favourable, and reduce the losses associated with power transmission. The proximity of the site to the existing 132 kV power line (± 5 km from the site) connecting to the Eskom grid with a line-in line-out configuration is deemed most appropriate. Alternatively connecting to the Everest Substation (± 12 km) or Leander Substations (± 11 km) with a new powerline. Both options allow for a feasible connection point. The solar PV site is also located within the strategic transmission corridor (central corridor)⁸ important for the planning of electricity transmission and distribution infrastructure, which allows for the fast tracking of applications for environmental authorisation for electricity transmission and distribution expansion. See Figure 4.

⁸ Government Notice No. 113 in Government Gazette No. 41445

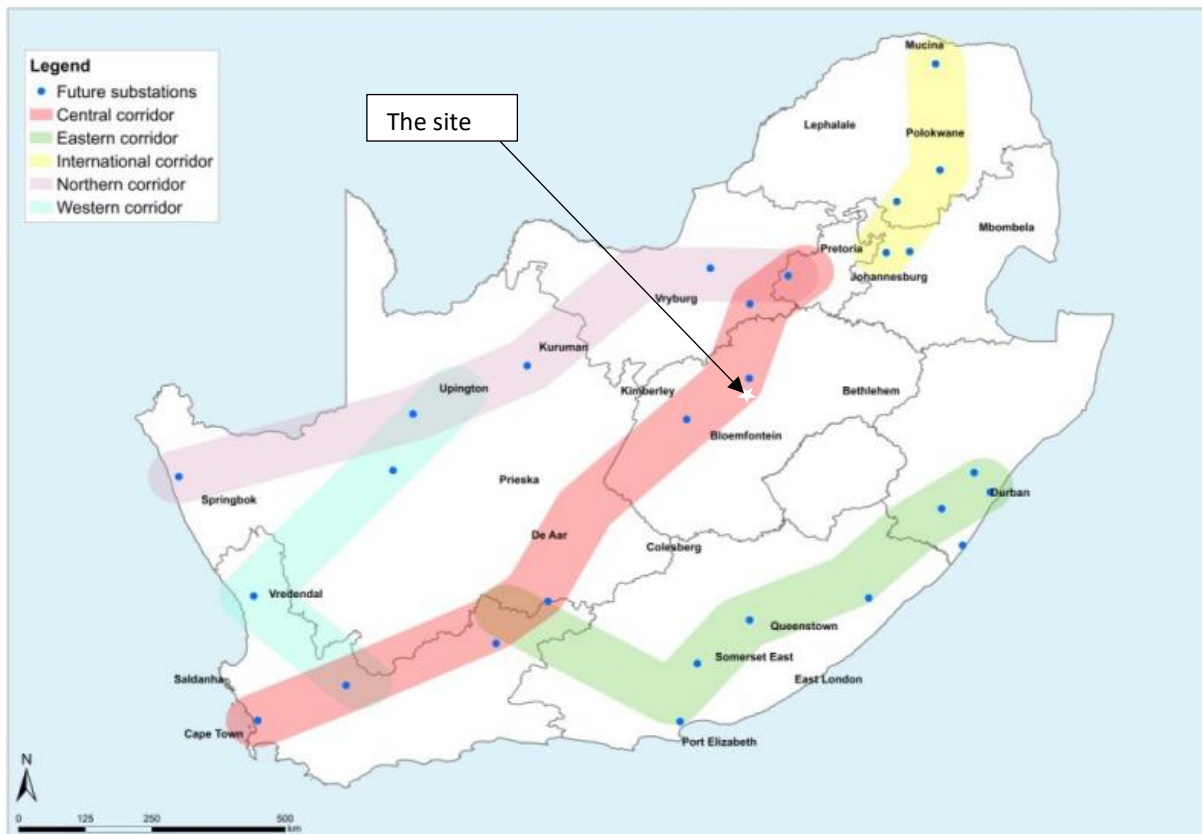


Figure 12: PRELIMINARY POWER CORRIDORS BASED ON THE ESKOM STRATEGIC GRID PLAN STUDY 2040

6.1.3 SOCIO-ECONOMIC IMPACT

Power generation is one of the rare growth opportunities for the Free State Province due to the high solar irradiation levels and the solar PV facility's strategic location in terms of the Strategic Transmission Corridors (8.1 Central Corridor) compiled in terms of section 24(3) of National Environmental Management Act, 1998. This setup creates growth opportunities for the area, and the establishment of a renewable energy project is considered important to diversify and complement the economic development of the region.

6.1.4 EMPLOYMENT & SKILLS TRANSFER

The benefits of renewable energy facilities to local regions are not confined to the initial investment in the project. They also provide a reliable and on-going income for landowners and municipality, creating direct employment opportunities for locals, as well as flow-on employment for local businesses through provision of products and services to the project and its employees.

Khauta North SPV Facility will have a positive impact on local employment. During the estimated 18-month construction phase, job opportunities will involve about 5 000 man-months and approximately 15-20 full time individuals during the operation. The majority will be provided by the local labour market. Due to the fact that there is limited local skilled labour in the field of renewable energy, the employment structure will likely consist of local and outside capacity. To guarantee successful operations over the lifetime of the investment, Khauta

North SPV Facility will likely use the skills of outside labour to cross-train local specialists. This cross training and skills development will take place especially in the area of technical maintenance and administration.

6.1.5 SUSTAINABLE GROWTH AND DEVELOPMENT

The benefits of renewable energy facilities, such as the proposed Khauta North SPV Facility, to national, provincial, and local development goals are as follow:

The proposed project shall benefit several key areas from broader international policy to local development goals;

Assist South Africa in meeting international greenhouse gas emission reduction targets as set under the Kyoto Protocol;

Support goals and objectives of South African national policy on climate change and renewable energy provisions, such as the Integrated Resource Plan of 2010/2018;

Support the mandate of the National Energy Regulator of South Africa (NERSA) and the Department of Energy (DoE) Independent Power Producers (IPP) procurement programme which aims to capacitate clean energy generation through feed-in mechanisms;

Give mobility to the Free State Province's SDF's principles of promoting land use, of being a developmental state, aligning environmental management priorities and sustainable economic growth under the Free State Growth and Development Strategy;

Meeting the needs of the Matjhabeng Local Municipality's IDP, namely those of developing a positive contribution to national policies and strategies and promoting human resources through training and implementation of new technological aids. The need for infrastructure development is further mentioned as an objective hereof;

The local community shall benefit from long-term economic incentives including both short- and long-term job creation; and,

As a consequence to these economic incentives, positive social repercussions shall include skills development.

6.2 SITE SELECTION CRITERIA

A range of criteria will be considered, which affect the suitability of an area for a Solar Energy Facility and which could potentially constrain or guide development. The criteria include technical, environmental, and land use considerations. The following is a comprehensive list of the criteria considered:

- **Technical Considerations**
 - Sufficient solar resource,
 - Capacity of the local electrical distribution network, and
 - Proximity to ESKOM substation.
- **Environmental Considerations**
 - Proximity to provincial or nationally significant parks or wetlands,
 - Proximity to natural areas and sensitive environments, and

- Any other sensitive provincial or municipal designations.
- **Land Use Considerations**
 - Available access to the land and suitable ground conditions,
 - Other nearby land uses in the area, and
 - Proximity to residential properties, communities, and towns.
- **Planning Considerations**
 - Municipality official plans and zoning by-law regulations, and
 - Provincial Policy Statement and regional planning ordinances.

The identification of the affected properties for the development of Khauta North SPV Facility was based on the following location characteristics.

Site Extent

An area of approximately 273ha would be required for a facility of up to 165MW of export capacity. The proposed site, which is approximately 515 ha in extent, will therefore be sufficient for the development of the proposed facility, and should allow for the avoidance of any identified environmental and/or technical constraints in terms of the final design of the facility.

Land availability and site access

The land is currently leased/owned by farmers. Access to the proposed area is gained by existing access to the properties via farm roads off the R70, R34 and secondary road S173, approximately 3 – 4 km from Riebeeckstad and 10 – 20 km from Welkom. The site is therefore appropriately located for transport of components and equipment as well as labour traveling to and from the site.

Climatic Conditions

The economic viability of a PV solar farm is directly dependent on the annual direct solar irradiation values. The site has been indicated as an area of high irradiation, which indicates that the regional location of the project is appropriate for a solar energy facility (Solar GIS, 2021). The irradiation level is an important factor in a highly competitive bidding environment under REIPPPP.

Gradient

A relatively flat surface area is preferred for the installation of PV panels. The slope of the proposed site is considered to be acceptable from a development perspective, which reduces the need for extensive earthworks and associated levelling activities, thereby minimising environmental impacts.

Grid Connection

The proposed site is situated adjacent to a 132kV power line. The electricity generated by the facility is expected to be fed into the power line using a loop-in-loop-out connection (Alternative option 1). However, the proponent will need to apply for a cost estimate letter from Eskom to determine the best option in detail, based on the existing infrastructure.

Environmental Sensitivity

Establishment of a PV solar facility requires a large amount of land, which may result in adverse impacts on the environment. No fatal flaws in terms of the environment were identified by the brief Spatial Development Framework (SDF), desktop assessment (Appendix CA detailed Site Sensitivity Verification process will be undertaken during the EIA phase. It is anticipated that no rivers or wetlands will be present on the proposed development site as the majority of the area has been previously disturbed. Appropriate buffers will be applied to watercourses in proximity to the proposed facility.

Enviroworks undertook a site investigation and site sensitivity verification with specialists, in May 2022, to identify sensitive areas and no-go areas and to provide buffers for sensitive areas to determine the potential buildable area for the proposed 165 MW SPV facility. The findings and recommendations of the site sensitivity verification are presented in Appendix D. The potential buildable area will be assessed in greater detail during the EIA Phase through site-specific specialist impact assessment studies. The specialists' findings will be included in the draft EIR, which will be made available to I&APs for review.

7 CONSIDERATION OF PROJECT ALTERNATIVES

In accordance with the requirements of the EIA Regulations, 2014 (as amended), it calls for feasible and reasonable alternatives to be considered during environmental impact assessment process. All identified, feasible and reasonable alternatives are required to be identified in terms of social, biophysical, economic and technical factors.

In terms of the EIA Regulations, 2014 (as amended) the definition of “alternatives” in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to:

- the property on which or location where it is proposed to undertake the activity;
- the type of activity to be undertaken;
- the design or layout of the activity;
- the technology to be used in the activity; and
- the operational aspects of the activity.

The other critical aspects in the definition of project alternatives are terms such as ‘reasonable’, ‘practicable’, ‘feasible’ or ‘viable’. Given the understanding, there are essentially two types of alternatives, the incrementally different (modifications) alternatives to the project; and the fundamentally (totally) different alternatives to the project.

- Fundamentally different alternatives are usually assessed at a strategic level and EIA practitioners recognise the limitations of project specific EIAs to address fundamentally different alternatives. Electricity generating alternatives have been addressed as part of the National Integrated Resource Plan (NIRP) published by the National Energy Regulator of South Africa (NERSA) and the Integrated Strategic Electricity Plan (ISEP) undertaken by Eskom. Environmental aspects are considered and integrated into the NIRP and ISEP using the strategic environmental assessment approach, focusing on environmental life-cycle assessments, water-related issues and climate change considerations.
- The environmental scoping phase, thus, can only meaningfully consider site-specific alternatives of the proposed Khauta North SPV Facility that will be developed.

7.1 ACTIVITY ALTERNATIVES

The scoping process also needs to consider if the development of a SPV facility would be the most appropriate land use for the particular site. Proposed activity alternatives that will be assessed during the EIA phase will include the following:

- Solar photovoltaic (PV) facility – 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 (indicated as an area of high irradiation – 2093 kWh/m²/annum) (Figure 5). Solar PV technology is also preferred when compared to Concentrated Solar Power technology (discussed below) because of the lower visual profile.

- Concentrated solar power (CSP) facility - A CSP has a high visual impact and requires large volumes of water, this is a major constraint for this type of technology considering the water challenges and limitation experienced not only in the country but also the local area. While the irradiation values are high enough to generate sufficient solar power, the water constraints render this alternative not feasible. It must also be noted that the IRP no longer includes the use of CSP as part of the energy mix of the county. Therefore, this alternative will not be considered further in this report.
- Wind energy facility - Due to the local climatic conditions a wind energy facility is not considered suitable as the area does not have the required wind resource. Furthermore, the applicant has opted for the generation of electricity via solar power rather than the use of wind turbines. This alternative is therefore regarded as not feasible and will not be evaluated further in this report.

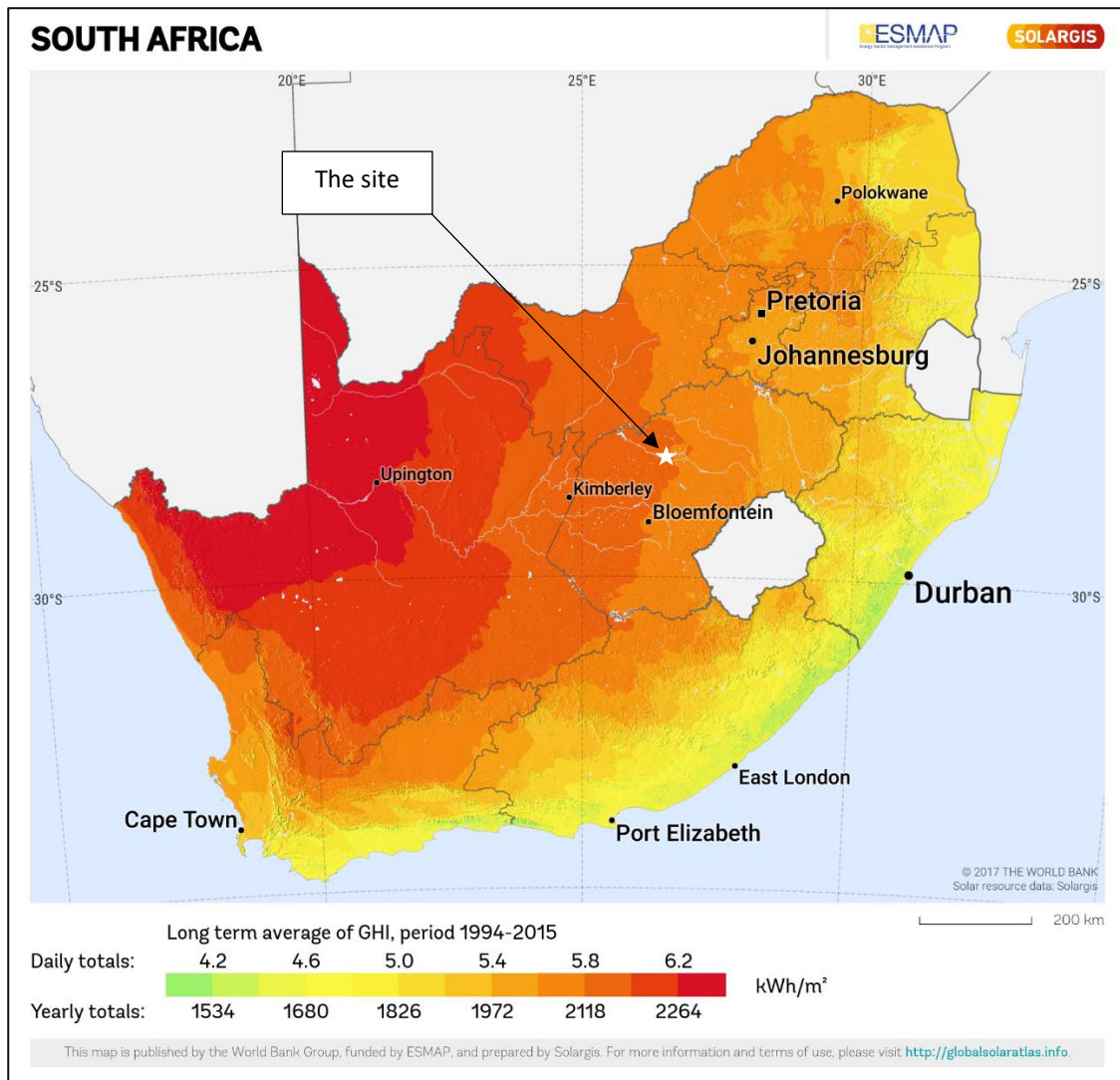


Figure 13: GLOBAL HORIZONTAL IRRADIATION VALUES FOR SOUTH AFRICA (SOLAR GIS, 2021).

7.2 SITE ALTERNATIVES

Due to the nature of the development, the location of the project is largely dependent on technical factors such as solar irradiation, climatic conditions, extent to topography of the site and available grid connection.

A preliminary cluster area of ~980 ha was identified by the Proponent as being technically feasible.

Various specialist studies have been commissioned to outline the site sensitivity verification (SSV) within the greater study area (~980 ha). The objective of the various specialist studies will be to provide the following for their respective fields:

- A brief description of the site with high-level feedback on the proposed development footprint;
- Identify Sensitive areas;
- Identify No-go areas;
- Provide buffers for sensitive areas; and,
- Provide overall spatial files and maps that outline the sensitive areas, no-go areas and possible buildable area for development.

Of the preliminary ~980 ha of the cluster area that was assessed (via the SSV process, that was preceded by a desktop assessment), ~ 690 ha has been identified as suitable for development, considering the findings of the specialists listed in the table below. The outcome of this SSV Report (Appendix D) was used to inform the Proponent in developing the project scope of works and site layout plan (also refer to Figure 9 – Section 8.6) for the proposed development footprint⁹ of the Khauta North SPV Facility. Therefore, no site alternatives will be further assessed.

Table 8: Proposed specialists to be involved during the site sensitivity verification

SITE SENSITIVITY VERIFICATION SPECIALIST	SPECIALIST
Avifaunal	Mokgatla Molepo (Pri.Nat.Sc.) from Moira Ecological Services (Pty) Ltd
Agricultural	Dr Johann Lanz (Pri.Nat.Sc.)
Terrestrial & Aquatic Ecological	Rikus Lamprecht (Pri.Nat.Sc.) from EcoFocus Consulting (Pty) Ltd
Economic Desktop Assessment	Petrus J van Jaarsveld (ESSA #0116)
Heritage and Archaeological	Jonathan Kaplan from Agency for Cultural Resource Management (ACRM)
Palaeontological	Dr John Almond from Natura Viva CC
Terrestrial Biodiversity, Plant- and Animal Species	Mr Roy de Kock M.Sc (Pri.Nat.Sc.) from Blue Leaf Environmental (Pty) Ltd. Megan Smith M.Sc Biological Sciences (EAPASA: Registered EAP) from (t/a Enviroworks).
Social	Michael Leach (EAPASA Reg: 2021/3872) from Enviroworks
Visual	Assessment to be undertaken during EIA Phase
Geo-Technical Desktop Assessment	BVi Consulting Engineers Western Cape (Pty) Ltd

7.3 LAYOUT ALTERNATIVES

The proposed Khauta North SPV Facility is expected to have a development footprint of approximately 273ha (Figure 4), within the total extent of the 515 ha of Portion 0 of the Farm Kopje Alleen No. 81 and Portion 1 of the Farm Kopje Alleen No. 81.

The site layout plan (buildable area) for the 165 MW Khauta North SPV Facility (Figure 15) will be informed and developed to avoid identified sensitive areas and buffers around sensitive areas. The preliminary potential impacts of the project will be identified by the EAP and participating specialists, the significance thereof will be assessed in the Environmental Impact Report and the development layout will be finalised during the EIR phase.

⁹ The development footprint is the defined area (located within the development area) where the PV panel array and other associated infrastructure for Khauta North Solar PV Facility is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed.

7.4 TECHNOLOGY ALTERNATIVES

7.4.1 SOLAR PV TECHNOLOGIES

Very few technological options exist as far as PV technologies are concerned; those that are available are usually differentiated by climatic conditions that prevail. The impacts of the different PV technologies on the environment are very similar. The construction, operation and decommissioning activities associated with the facility will all be the same, irrespective of the chosen technology. Both technology alternatives are considered reasonable and relevant to this application, based on the current technology available and potential engineered simplification of solar tracking systems in the coming years.

The Fixed and Tracking PV panel technologies are both considered for the proposed Khauta North SPV Facility. The different solar PV panel technologies are briefly discussed in the following sub-headings:

- Fixed / mounted PV panels; and,
- Tracking PV panels (these solar panels rotate to follow the sun's movement/trajectory).

7.4.1.1 **FIXED MOUNTED PV SYSTEM**

In a fixed mounted PV System (Figure 6), the PV panels are installed at a pre-determined angle from which they will not move during the lifetime of the plant's operation. The limitations imposed on this system due to its static placement are countered by the fact that the PV panels are able to absorb incident radiation reflected from surrounding objects. In addition, the misalignment of the angle of the PV panels have been shown to only marginally affect the efficiency of energy collection. There are advantages which are gained from fixed mounted systems, and includes the following:

- The maintenance and installation costs of a fixed mounted PV system are lower than that of a tracking system, which is mechanically more complex given that these PV mountings include moving panels;
- Fixed mounted PV systems are an established technology with a proven track record in terms of reliable functioning. In addition, replacement parts are able to be sourced more economically and with greater ease than with alternative systems; and,
- Fixed mounted systems are robustly designed and able to withstand greater exposure to winds than tracking systems.

A typical fixed structure will have two rows of twenty (20) modules (2 strings). The modules are placed in portrait arrangement. The foundation technology is usually a direct-driven (rammed) installation, with a ramming depth subject to the soil characteristics, or reinforced concrete strip footings.



Figure 14: Example of a fixed mounted PV System.

The design of the fittings for fixing the modules to the rack structures will enable thermal expansion of the metal without transferring mechanical loads that could affect the integrity of the modules. The structure will probably have anti-theft bolts.

7.4.1.2 SINGLE / DUAL AXIS TRACKING SYSTEM

In a dual axis tracking system, PV panels are fixed to mountings which track the sun's trajectory. There are various tracking systems namely a single axis tracker or a dual axis tracker. A 'single axis tracker' will track the sun from east to west, while a 'dual axis tracker' will in addition be equipped to account for the seasonal waning of the sun. These systems utilise moving parts and complex technology, including solar irradiation sensors to optimise the exposure of PV panels to sunlight. Tracking systems are a new technology and, as such, are more complex to operate in South Africa. This is due to:

- A high degree of maintenance is required due to the nature of the machinery used in the system, which consists of numerous components and moving parts. A qualified technician is required to carry out regular servicing of these tracking systems, which are normally located in remote areas;
- The cost of the system is necessarily higher than a fixed mounted system due to the maintenance required for this system and given that separate mountings need to be placed apart from one another to allow for their tracking movement; and,
- A power source is needed to mechanically drive the tracking system and this would offset a certain portion of the net energy produced by the plant.

However, the additional improvements in capacity factor and efficiency may make a tracking system attractive despite these challenges. This can only be determined with a financial model during the more detailed design phase of the project.

7.4.2 BATTERY ENERGY STORAGE SYSTEMS TECHNOLOGIES

As technological advances within battery energy storage systems (BESS) are frequent. The Applicant may apply for “Solid State Batteries” (Figure 7) and/or “Flow Batteries” as the two technology alternatives for the BESS and, no preferred option is specified by the Applicant. These will be assessed as alternative technology options in the EIA phase. Due to uncertainty regarding the preferred technology type, which may only be determined with a financial model during the more detailed design phase of the project and/or during the construction tender process, the Applicant may apply for both technology types. It is therefore required that all technology risk types be assessed during the EIAs phase and mitigated in terms of the Environmental Management Programme (EMPr). The two BESS technology types considered are briefly described below.

7.4.2.1 SOLID STATE BATTERIES

Solid state battery electrolytes, such as lithium-ion (Li-ion), zinc hybrid cathode, sodium ion, flow (e.g. zinc iron or zinc bromine), sodium sulphur (NaS), zinc air and lead acid batteries, can be used for grid applications. Compared to other battery options, Li-ion batteries are highly efficient, have a high energy density and are lightweight. As a result of the declining costs, Li-ion technology now accounts for more than 90% of battery storage additions globally (IRENA, 2019).

These energy storage units come in a range of containerised systems with size categories from 500 kWh to 4 MW. The total footprint area required for the containerised systems to accommodate a 165 MW project with this type of battery is approximately 3.8 ha.

Solid state batteries consist of multiple battery cells that collectively form modules. Each cell contains an anode, cathode and a solid electrolyte. Modules are usually assembled within shipping containers and delivered to the site. Multiple containers will be required. The container unit dimensions are approximately 17 m long, 3.5 m wide, and 4 m high. Containers will be placed on a raised concrete plinth (300 mm) and may be stacked on top of each other to a maximum height of approximately 8 m. Additional instrumentation, including inverters and temperature control equipment, may be positioned between the battery containers.



Figure 15: TYPICAL ILLUSTRATION OF A BATTERY ENERGY STORAGE SYSTEM TECHNOLOGY

Considering the nature of the project, a solid-state technology type would be envisaged for the proposed technology. The technology includes batteries housed within containers which are fully enclosed and self-contained. Therefore, the assessment proposes all solid-state technologies for authorisation to allow the precise technology to be selected when the project is implemented, on the understanding that further investigation into the specific technologies available at the time of being awarded preferred bidder status will allow for one of two to be selected and ultimately developed.

7.4.2.2 REDOX FLOW BATTERIES

Flow-battery technologies provide alternative means for power smoothing through on-site battery storage. For this technology, energy is stored as an electrolyte in the flow cells. Options include Sodium polysulfide/bromine (PSB) flow batteries, Vanadium Redox (VRB) flow batteries, and Zinc-Bromine (ZNBR) flow batteries which would be contained in small banded areas. The footprint of a Redox Flow Battery (RFB) system is approximately 150 m x 100 m, with a height of 8 m. For this technology, energy is stored as an electrolyte in the flow cells. The system consists of two electrolyte storage tanks that are contained within a 2.5 m high berm wall, which prevents leakage of the electrolyte chemical into the surrounding environment.

7.4.3 ACCESS ROUTE ALTERNATIVES

Three access road alternatives (ranging from approximately 2 – 3 km in length) have been identified that could provide access to the affected properties via gravel roads off the R70, R34 and secondary road S173 and will be considered / screened during the EIA phase.

7.5 THE NO-GO ALTERNATIVE

The 'no-go' or 'do-nothing' alternative is the option of i) not constructing the proposed Khauta North Solar PV Facility or ii) identifying environmental sensitive areas on the proposed properties and exclude them from the development footprint.

Should i) be selected to reject the whole proposed Khauta North Solar PV Facility, then there will be impacts at a local and broader scale. From a local perspective, the identified site, which is zoned for agricultural purposes, would not be impacted on from an environmental perspective, and could be utilised for future agricultural activities. However, at a broader scale, the potential benefits of additional capacity to the electricity grid and those associated with the introduction of renewable energy would not be realised. Although the proposed facility is only proposed to contribute 50MW to the grid capacity, it would assist in meeting the growing electricity demand through the country and would also assist in augmenting government's renewable energy goals.

Should sensitive environmental areas be identified on the proposed farms, these need to be clearly indicated in the final layout map as no-go areas and conservation and preservation management recommendations must be included in the Environmental Management Plan.

The assessment of alternatives must at all times include the "no-go" option as a baseline against which all other alternatives must be measured. The option of not implementing the activity or excluding sensitive areas from development must always be assessed and to the same level of detail as the other feasible and reasonable alternatives. The "no-go" option is taken to be the existing rights on the property, including the approved PV facility, and this includes all the duty of care and other legal responsibilities that apply to the owner of the property

8 DESCRIPTION OF THE ENVIRONMENTAL ATTRIBUTES

This section of the Scoping Report provides a description of the environment that may be affected by the proposed Khauta North SPV Facility. This information is provided in order to assist the reader in understanding the proposed effects of the proposed project on the environment. Aspects of the biophysical, social, and economical environment that could directly be affected by, or could affect, the proposed development have been described. This information has been sourced from both existing information available for the area as well as collected field data and aims to provide context within which the scoping is being conducted.

8.1 CLIMATE

The rainfall of the region peaks during the summer months and the Mean Annual Precipitation (MAP) of the area is approximately 577 mm (www.climate-data.org). The maximum average monthly temperature is approximately 23.3°C in the summer months while the minimum average monthly temperature is approximately 9.7°C during the winter. Maximum daily temperatures can reach up to 29.7°C in the summer months and dip to as low as 2.4°C during the winter.

Climate change projections for the region indicate high-range warming with temperature increases from 2.5 – 3.3°C as well as more very hot days (> 35°C) in the next 30 years (CSIR, 2019). It is anticipated that there will be an increase in annual rainfall by as much as 100 mm/year, together with more extreme convective rainfall events and the associated increases in lightning strikes.

8.2 TOPOGRAPHY

Topographically the study area is relatively flat and occurs between 1 380 and 1 400 meters above sea level (Mucina et al., 2006).

8.3 GEOLOGY AND SOILS

According to Mucina & Rutherford (2006), the assessment area is mainly covered by deep sandy to clayey alluvial soils developed over quaternary alluvial sediments. Both alluvial and residual soil layers are expected to comprise high clay contents and highly expansive clay minerals.

Preliminary findings by Dr Johann Lanz (2022), indicated that the land type across the site has a high proportion of shallow, clay-rich soils of the Sterkspruit and Valsrivier soil forms that are unsuitable for crop production. The on-site soil investigation will confirm the dominance of these shallow, clay-rich soils across the site. The cropping potential may be constrained by the shallow depth above the limiting, dense clay horizon in the subsoil.

Based on the expected presence of deep alluvial and residual soils overlying the bedrock, driven piling systems should be considered as founding solutions for the proposed solar panels. Piling systems would have to be designed to resist heave action of expansive clays. Where shallow bedrock is encountered, founding of the solar PV support structures may take place by means of pad foundations (BVi, 2021).

8.4 LAND-USE

The development is located on old historically cultivated agricultural lands, approximately 4 km from the urban edge of Riebeeckstad. All the lands across the project area are now used only for grazing. These lands are likely to have been cropped with economic viability in the past, but they have been abandoned as cropland because they were found to be too marginal for viable crop production as the agricultural economy became more challenging, particularly in terms of high input costs (Dr Johann Lanz, 2022).

There are several mining operations surrounding Welkom, which lie to the south and the east of the proposed solar PV development. The nearest mine shaft is located 7 km from the SPV Cluster. A land cover map will be generated during the EIA phase.

8.5 AGRICULTURAL POTENTIAL

The assessment area consists of a mosaic of mainly natural undisturbed terrestrial grassland and to a lesser extent, old historically cultivated agricultural lands, which was last cultivated approximately seven (7) years ago.

The majority of the proposed site is classified on the screening tool as less than high (medium) sensitivity for impacts on agricultural resources (refer to Figure 8). The 2016 Land Capability Evaluation (Department of Agriculture, Forestry and Fisheries) identified the farm portion as having low-moderate soil capability for long term agricultural use. This will be verified during the EIA phase.



Figure 16: THE PROPOSED DEVELOPMENT FOOTPRINT OVERLAID ON AGRICULTURAL SENSITIVITY, AS GIVEN BY THE DFFE SCREENING TOOL (YELLOW = MEDIUM; RED = HIGH).

Preliminary findings by Dr Johann Lanz (2022), indicated that the site may have medium agricultural sensitivity with a land capability of 7, due predominantly to soil constraints in combination with the climate that make the site too marginal for crop production. The site may not be suitable for viable and sustainable crop production and is used only for grazing, but will be verified in the EIA phase.

The allowable development limit for non cropland with a land capability value of less than 8, as this site has been confirmed to be in the site sensitivity verification report (Appendix D), is 2.5 ha per MW. The proposed agricultural footprint of the facilities is approximately 273 hectares, and the generation capacity is 165 MW. This is well within the 2.5 ha per MW limit. The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site.

The level of agricultural assessment required in terms of the protocol for sites verified as less than high sensitivity is an Agricultural Compliance Statement.

The terms of reference for this study are to fulfill the requirements of the *“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”*, Gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA). The statement will therefore be included as part of the EIR.

8.6 SURFACE WATER

The development footprint falls within the Middle Vaal Water Management Area (WMA 9). Majority of the development footprint falls within the associated C25B quaternary surface water catchment- and drainage area.

A significant first-order seasonal watercourse/tributary associated with the commencement portion of the Sandspruit, flows past the assessment area, directly adjacent north and continues in a westerly direction into the Sandspruit, approximately 400 m - 600 m to the north of the assessment area. Surface water runoff from the central and northern portions of the assessment area situated north of the highpoint/ridge apex, consequently mainly drains towards this watercourse.

Five artificially constructed earth dams are present within- and along the length of the seasonal watercourse/tributary associated, approximately 210 m to the north and east of the assessment area. The watercourse and associated earth dams, house locally distinct and important aquatic and semi-aquatic habitats, which are visibly utilised by various common and habitat-specific waterbirds, amphibian species and aquatic invertebrates for breeding, foraging and/or persistence purposes.

Three small preferential water flow paths/drainage lines are present within the central-northern portion of the development footprint (see figure below). These flow paths/drainage lines traverse some old historically cultivated agricultural lands and merely assist with channeling surface water runoff from a very small portion of the assessment area, towards the significant watercourse to the north. A Water Use License Application (WULA) shall be submitted to the Department of Water and Sanitation (DWS), to request authorisation for the proposed development through the flow paths/drainage lines, in accordance with the National Water Act (Act 36 of 1998).

The Commandants Pan constitutes a well-known significantly sized naturally occurring depression pan, which is situated approximately 270 m south-east of the assessment area. The pan is seasonally/temporarily inundated and the inflow of the pan mainly originates from a significantly sized unchanneled valley-bottom wetland, situated approximately 550 m east of the assessment area.

A significantly sized naturally occurring unchanneled valley-bottom wetland, is located approximately 110m south-east of the assessment area. The localised topography flattens-out slightly in the vicinity of the subsequent unchanneled valley-bottom wetland, which results in this subsequent wetland being seasonally/temporarily inundated.

One naturally occurring depression wetland is situated approximately 216 m east of the assessment area, respectively.

The layout and designed of the facility (see figure below) have been informed with the input of registered terrestrial, biodiversity and aquatic specialists. Recommendations were incorporated into the layout design in an attempt to maintain the hydrological and ecological functionality and -integrity of the watercourse and semi-

aquatic fauna in the area and to prevent any significant increase in sediment inputs and contamination. The following buffer zones¹⁰ were incorporated into the layout design of the facility, comprising:

- A minimum **water quality buffer** of 80 m from the edge of watercourse and associated earth dams and depression wetland.
- a minimum **water quality buffer** of 80 m around the edge of the unchanneled valley-bottom wetland and the Commandants Pan
- A minimum **biodiversity buffer** of 200 m from the edge of all watercourse and associated earth dams.
- A minimum **biodiversity buffer** of 250 m around the Commandants Pan and depression wetland.

Watercourses, preferential water flow paths/drainage lines will be assessed within the boundaries of the farms to ensure the proposed development footprint does not impact on the water courses.

8.7 GROUND WATER

The aquifer beneath this site is classified as an intergranular fractured aquifer and the yield potential ranges between 0.1 - 0.5 ℓ/s. This is a minor aquifer and the depth to groundwater is approximately 37 m below ground level¹¹ (DWS GRA2, 2005).

Groundwater resource maps show that the aquifer is moderately vulnerable. Aquifer vulnerability indicates the tendency for contamination to reach the groundwater system after introduction to a location above the uppermost aquifer. As such, this aquifer is susceptible to contamination from pollutants that are continually discharged or leached.

In general terms, the groundwater in the vicinity of the project can be said to be slightly saline, with a marginally salty taste. The electrical conductivity, which provides a measure of the groundwater quality ranges from 70 – 150 mS/m.

8.8 AVIFAUNA

The preliminary site assessment revealed that the solar panels will be located on old farmlands that consist of overgrown vegetation. It is anticipated that bird species may be present within and around the proposed site. The area has several surrounding pans that attract a variety of waterfowl, including migrants. This makes the waterbodies an important habitat that warrant protection. An Avifaunal Impact Assessment will be undertaken during the EIA phase.

The recommendations and conditions of the Avifaunal Impact Assessment will be included in the project specific Environmental Management Programme (EMPr) for implementation during all project phases.

¹⁰ A Practical Field Procedure for the Identification and Delineation of Wetlands and Riparian Areas (DWAF, 2005).

¹¹ Product developed as part of Groundwater Resource Assessment Phase 2 (GRA2, 2005), and modelled as 1 km x 1 km raster. Waterlevel Grid (mbgl)

8.9 FAUNA AND FLORA

The properties are currently being used for cattle and game farming. However, grazing intensity is expected to be low based on the high diversity of indigenous plants.

The old lands were verified to be rehabilitated grassland that are less than 10 years old. Although these areas are not considered “natural vegetation” as per the National Environmental Management Act (Act 107 of 1998), these areas are similar in species composition to Habitat Unit 1 (Figure 2 and 5) and are expected to function in a similar manner. Therefore, old lands are considered to be successfully rehabilitating and are likely to support a variety of faunal and floral species and contributed to the overall ecological significance of the area. No threatened or protected species were recorded within these old lands.

In terms of threatened fauna (Appendix D6), suitable habitat and the presence of giant girdled lizard¹² (*Smaug giganteus* – classified as Vulnerable¹³), is expected on-site and this will need to be confirmed by a taxon specialist. In addition to this, should any threatened fauna be found on-site, suitable relocation habitats will need to be identified.

The identification of these 2 sites will be based on:

1. Sites located outside the project areas;
2. Identifying existing communities with active burrows; and
3. Mapping suitable habitats surrounding active burrows.
4. Both areas identified as offsite suitable habitats should contain existing communities located within active burrows that are in current use.

Although the development footprint is mapped within the Highveld Alluvial Vegetation type, the vegetation found on site is more botanically representative of Western Free State Clay Grassland or Central Free State Grassland (both classified as Least Threatened), due to soil’s high clay content (confirmed by the Aquatic Biodiversity Specialist) and the dominance of *Themeda triandra* and *Cymbopogon sp.*, and the low abundance of trees. There are, however, areas that have a high abundance of *Vachelia karoo* which is most likely a result of increased moisture in the soil or clay. The description of the vegetation on site was confirmed by consultation with a Grassland specialist (G Bredenkamp, pers. comm) and the Aquatic Biodiversity Specialist.

According to the Screening Tool Report compiled for the proposed 165 MW SPV facility, the Plant Species-, Avian, and Aquatic Biodiversity theme sensitivity is Low. The animal species theme sensitivity is also classified as Low, however, this classification is subject to confirmation in terms of the Screening Tool Report.

It is expected that a Compliance Statement will be submitted, as part of Plan of Study for EIA, for the following sensitivities within the development footprint:

- Plant Species,

¹² Classified as Vulnerable and is provincially protected by the Free State Nature Conservation Ordinance (8 of 1969)

¹³ IUCN 2020.

- Animal Species; and
- Aquatic Biodiversity.

8.10 AQUATIC CONSERVATION STATUS

The Free State Province does not possess separate/specific spatial data for terrestrial and aquatic provincial biodiversity conservation statuses/categories. The relevant provincial information is rather combined into a single wholistic provincial biodiversity conservation status/category spatial data set, which sets out biodiversity priority areas in the province. This spatial data set is known as the Free State Provincial Spatial Biodiversity Plan 2018.

Areas mapped as natural and within sensitive areas (i.e., Critical Biodiverse Areas (CBA), Other Natural Areas, and Ecological Support Areas (ESA); see Figure 13 below) are considered to be ecologically significant. The proposed development footprint can potentially be located on areas classified as 'Degraded'. The southern end of the two farms, is situated within the CBA 1 area as noted on the Screening Report. However the condition and classification of the area will be verified during the specialist assessments.

8.11 CONSERVATION AREAS, PROTECTED AREAS AND IMPORTANT BIRD AREAS

The South African Protected Areas Database (SAPAD) are GIS inventories of all Protected (PA) areas in South Africa (DFFFE, 2021). The database also includes data on privately owned protected areas. The surrounding protected areas in proximity to the proposed development footprint are:

- Newlands Game Ranch (Nature Reserve) - 2.7 km to the west;
- Thabong Game Ranch (Nature Reserve) - 6.4 km to the south;
- Goliatskraal Private Nature Reserve - 16 km to the north-east; and
- De Rust Private Nature Reserve - 11.2 km to the north.

Buffers around protected areas are drawn at distances as defined in Listing Notice 3 of the EIA Regulations, 2014 (as amended).

8.12 PALEONTOLOGICAL RESOURCES

Based on the published 1: 250 000 geological map 2726 Kroonstad (Schutter 1993) the combined project area is almost entirely underlain by Middle to Late Permian basinal mudrocks of the Volksrust Formation (Ecca Group) that are of Low to (at most) Medium Palaeosensitivity.

Based on the SAHRA sensitivity map the area is of high sensitivity, concurring with the DFFE Screening Tool indicating the area as very highly sensitive because of the potential of finding trace fossils. The level of assessment required in terms of the protocol is a desktop study.

With the possible exception of some shallow drainage lines, bedrock exposure in this area of very low relief is likely to be minimal due to pervasive soil and vegetation cover. Most of the area is already disturbed by agriculture.

Detailed assessments will be undertaken during the EIA phase.

8.13 HERITAGE

According to the Screening Tool Report compiled for the proposed 165 MW SPV facility, the archaeological and cultural heritage theme sensitivity is low. The proposed development footprint will be assessed for possible archaeological and heritage resources to establish the potential impact on any cultural resources that might be found. The HIA will be undertaken in terms of the NHRA.

8.14 LANDSCAPE (SOLAR) / VISUAL RESOURCES

According to the DFFE Screening Tool Report compiled for the proposed solar PV facility, the landscape (solar) theme sensitivity is Very High (Figure 9), due to the proximity of nearby nature reserves and koppies, however, the greatest portion of area is classified as having a Medium landscape (solar) theme sensitivity.

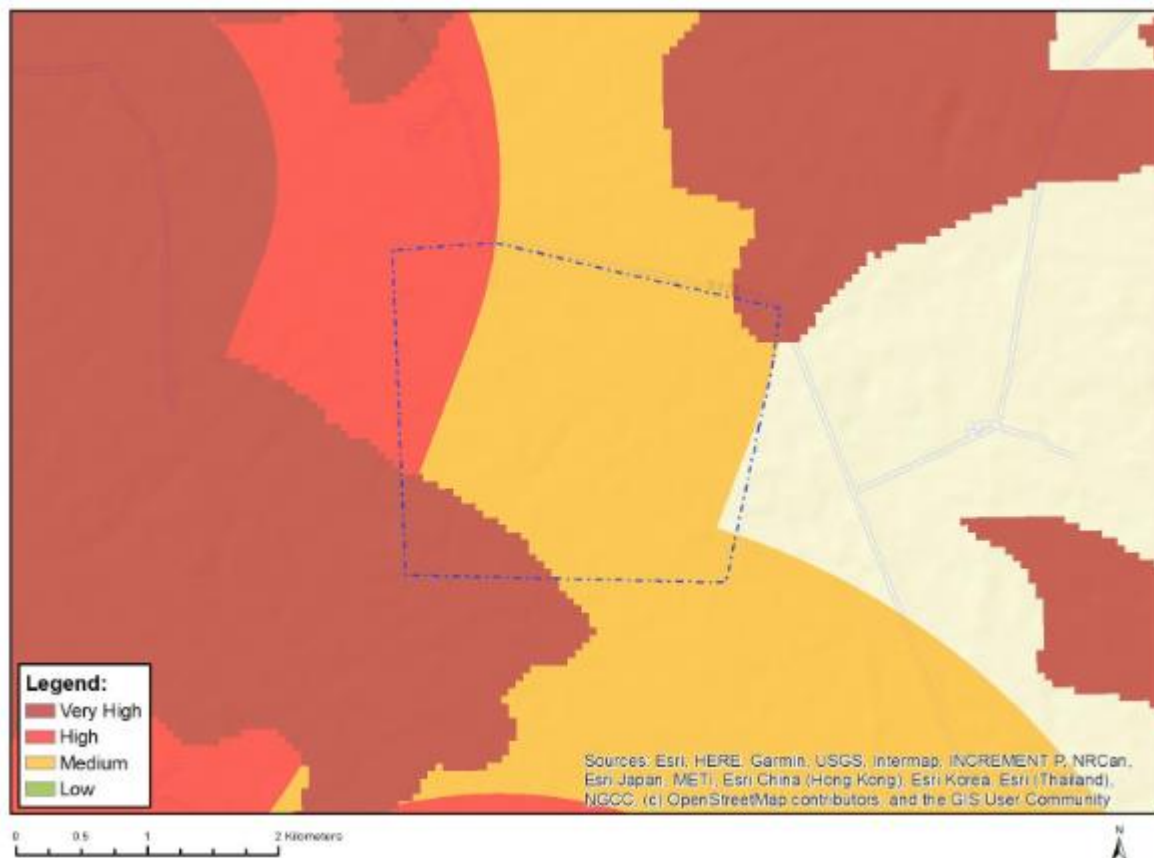


Figure 17: MAP OF RELATIVE LANDSCAPE (SOLAR) THEME SENSITIVITY

Based on the Desktop Visual Impact Assessment (2021) compiled in accordance with the Guidelines for involving a Visual and Aesthetic Specialist in the EIA process (DEA&DP, 2005), the viewshed analysis of each of the solar PV facility will be compiled within a ten kilometre (10 km) radius from the proposed development (Figure 10).

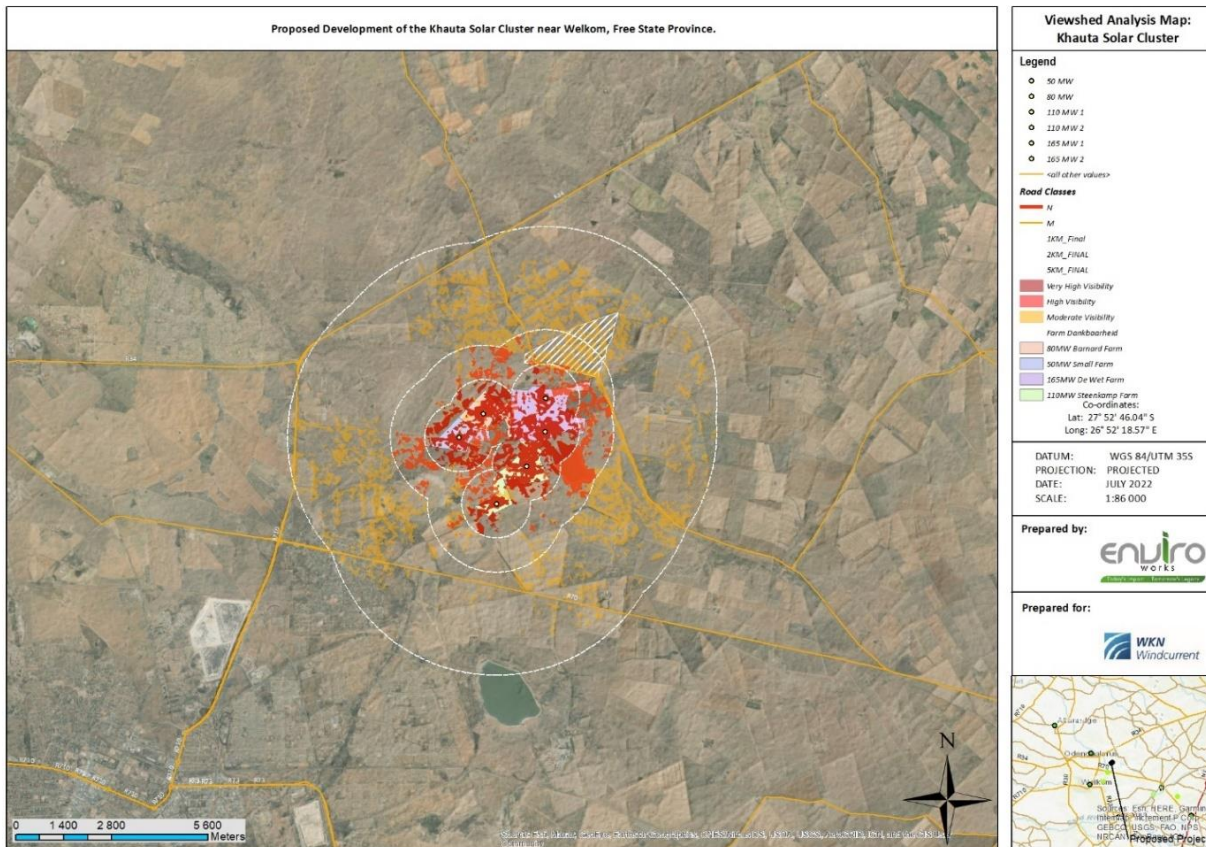


Figure 18: Desktop viewshed analyses of the proposed SPV facility

The solar PV facility is likely to have some impact on the viewscape especially since the site is located in a fairly rural natural landscape. The following mitigation measures will be assessed during the EIA phase:

1. Vegetation (Indigenous to the area) can be planted along the border fence of the property. Given the flatness of the study area something between ten (10) and fifteen (15) metres should suffice;
2. Galvanized steel structures could be coated to prevent glare; and,
3. Buildings can be painted different colours to blend in with the surrounding landscapes.

A high-level Visual Impact Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA.

8.15 SOCIO-ECONOMIC CONTEXT OF THE AREA

The proposed development is situated in the Matjhabeng Local Municipality. The Matjhabeng Local Municipality is a Category B municipality situated in the Lejweleputswa District in the Free State Province (Figure 25). The project area is located in Ward 10 of the Matjhabeng Local Municipality.

The main economic sectors include mining and manufacturing.



Figure 19: LEJWELEPUTSWA DISTRICT MUNICIPALITY AND THE LOCATION OF MATJHABENG LOCAL MUNICIPALITY

Based on the Desktop Economic Impact Assessment (2021), the municipal area where the site is located (Mathjabeng LM) is likely to experience some direct, indirect and induced impacts resulting from the activities on the site; however, it is unlikely that a local economy can be sufficiently diversified to supply all materials and services and support construction and operational activities from start to finish. See Figure 11.

It is expected that the proposed project will help diversify the national energy grid and assist in improving energy generation in the region. The project will also have a significant impact on the economy and has the potential for significant job creation and skills development especially during the construction phase of the project.

The only negative impact will be the potential loss of agricultural land, which have to be weighed against the positive impact of the proposed solar PV cluster.

A Socio-Economic Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA.

9 PUBLIC PARTICIPATION PROCESS

The EIA Regulations, 2014 (as amended) specify that a PPP must be conducted as an integral part of the EIA process. This chapter outlines the PPP that will be followed in terms of Regulations 39 to 44 during the Scoping Phase of the EIA process for the proposed Khauta North SPV Facility.

The aim and purpose of the PPP is to:

- Ensure all relevant key stakeholders and I&APs have been identified and invited to engage in the scoping phase;
- Raise awareness, educate and increase understanding of stakeholders about the proposed project, the affected environment and the environmental process being undertaken;
- Create a platform for key stakeholders and I&APs to freely communicate any issues or concerns and suggestions for enhancing potential benefits and/or to prevent or mitigate impacts;
- Accurately document all opinions, concerns and queries raised regarding the project; and,
- Ensure the issues and concerns of the stakeholders and I&APs related to the project are addressed in an adequate manner.

Regulation 40(2) of the EIA Regulations, 2014 (as amended) requires that PPP, contemplated in this regulation must provide access to all information that reasonably has or may have the potential to influence any decision with regard to an application unless access to that information is protected by law and must include consultation with—

- (a) the competent authority;
- (b) every State department that administers a law relating to a matter affecting the environment relevant to an application for an environmental authorisation;
- (c) all organs of state which have jurisdiction in respect of the activity to which the application relates; and,
- (d) all potential, or, where relevant, registered interested and affected parties.

9.1 CONSULTATION WITH AUTHORITIES AND ORGANS OF STATE.

In order to comply with this requirement, the proposal is to provide all parties listed in sub sections a, b and c above with access to digital copies of the Draft Scoping Report (DSR), Draft Impact Assessment Report (DEIR), Draft Environmental Management Program (DEMP) and all specialist studies and plans. Such digital copies will be provided to the Competent Authority, Organs of State and State Departments via digital platforms (email, website and direct download link). Where authorities such as DFFE and SAHRA, have online submission portals, these portals will be utilised for the submission of such reports. Where such authorities, state departments or organs of state do not have access to digital platforms, copies of the documentation will be provided to such parties upon request.

The following authorities and organs of state have been preliminary identified for this project:

- National Department of Forestry, Fisheries and the Environment (DFFE)
- Free State Province Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA)
- Lejweleputswa District Municipality
- Matjhabeng Local Municipality
- Department of Mineral Resources and Energy (DMRE)
- Eskom (Free State – Regional Office)
- National Department of Agriculture, Land Reform and Rural Development (DALRRD)
- National Department of Agriculture (DoA): Deputy Director General (Agricultural Production, Health and Food Safety, Natural Resources and Disaster Management)
- Provincial Roads Authority
- SANRAL
- South African National Heritage Resources Agency (SAHRA)
- Free State Heritage Resources Authority (FSHRA)
- Department of Water and Sanitation (DWS)
- Local Catchment Management Agency
- South African Radio Astronomy Observatory (SARAO)
- SKA South Africa (Project Office)
- Speakers Office (Ward Councillor – Ward No. 10)

9.2 CONSULTATION WITH POTENTIAL I&APS:

In terms of point d above (Section 9), all Interested & Affected Parties (I&APs) that are identified or register as part of the process has been directly informed of the EIA process via registered post, telephone calls, WhatsApps and emails and will be provided with access to digital copies of the to the Draft Scoping Report via the following:

- The digital copy of the documentation that will be available to download on the Enviroworks website (enviroworks.co.za) and direct download link;
- Will be included as an attachment to e-mails; and,
- Will be informed that copies of the documentation can be provided via postal or courier services should they not have access to the digital platforms provided.

9.3 GENERAL REQUIREMENTS

Section 39 - 41 of the EIA Regulations, 2014 (as amended) details the PPP that must take place as part of an EIA process. The table below lists these requirements along with the proposed actions to comply with both Section 41 as well as Section 9.1 and Annexure 2 of EIA Regulations.

Table 9: General PPP Requirements In terms of Regulation 41 of the EIA Regulations.

PUBLIC PARTICIPATION PROCESS REGULATED REQUIREMENT	PROPOSED ACTIONS
<p>Regulation 39(1) If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.</p> <p>(2) Subregulation (1) does not apply in respect of- (a) linear activities;</p>	<p>A landowner consent for the development has been obtained in terms of this requirement and no deviation or additional actions in terms this regulation is required.</p>
<p>Regulation 41.(2) The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by -</p>	
<p>(a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of -</p> <p>(i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and,</p> <p>(ii) any alternative site;</p>	<p>Site notices will be placed at the boundary of the property and the main access point to the property. No deviation or additional actions in terms of the Regulations are required in this regard.</p>
<p>(b) giving written notice, in any of the manners provided for in section 47D of the Act, to -</p>	
<p>(i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;</p>	<p>The landowner has been requested to assist with identification and notification of all tenants and occupiers on the properties. No deviation or additional actions in terms of regulation are required in this regard.</p>
<p>(ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;</p>	<p>Owners of adjacent properties for the non-linear components will be notified of this environmental process and will be provided with access to digital copies of the documentation via the website and direct download link. Landowners will be informed that copies of the documentation can be provided via postal or courier services should they not have access to the digital platforms. Such owners will be requested to inform the occupiers of the land of this environmental process and the process to obtain copies of the relevant reports.</p>
<p>(iii) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;</p>	<p>The ward councillor will be notified of this environmental process and will be provided with access to the digital copies of the documentation. The ward councillor will be informed</p>

PUBLIC PARTICIPATION PROCESS REGULATED REQUIREMENT	PROPOSED ACTIONS
	that copies of the documentation can be provided via postal or courier services should they not have access to the digital platforms.
iv) the municipality which has jurisdiction in the area;	Relevant departments of the Local Municipality as well as the District Municipality will be provided with access to the digital copies of the documentation. Municipal officials will be informed that copies of the documentation can be provided via postal or courier services should they not have access to the digital platforms.
(v) any organ of state having jurisdiction in respect of any aspect of the activity; and	All organs of state that have jurisdiction in respect of the activity will be notified of this environmental process and will be provided with access to the digital copies of the documentation. Organs of State will be informed that copies of the documentation can be provided via postal or courier services should they not have access to the digital platforms.
(vi) any other party as required by the competent authority;	DFFE and DESTEA will be given an opportunity to comment on the DSR, DEIR and Draft EMPr. DFFE and DESTEA will be given an opportunity to comment on the DSR, DEIR and DEMPr. Should the Departments identify any additional I&APs/parties that need to provide comment, copies of the documentation and opportunity to comment will be provided to such parties.
(c) placing an advertisement in - (i) one local newspaper; or (ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;	An advert calling for registration and notifying potential I&AP's of the availability of the DSR will be published in the Beeld newspaper on Wednesday, 17 August 2022, and the Vista local newspaper on Thursday, 18 August 2022.. There is currently no official Gazette that has been published specifically for the purpose of providing public notice of applications.
(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and	Adverts will not be placed in provincial or national newspapers, as the potential impacts will not extend beyond the borders of the municipal area.
(e) using reasonable alternative methods, as agreed to by the Competent Authority, in those instances where a person is desirous of but unable to participate in the process due to -	Notifications will include provision for alternative engagement in the event of illiteracy, disability or any other disadvantage. In such instances, Enviroworks will engage

PUBLIC PARTICIPATION PROCESS REGULATED REQUIREMENT	PROPOSED ACTIONS
<ul style="list-style-type: none"> i. illiteracy; ii. disability; or, iii. any other disadvantage. 	with such individuals in such a manner as agreed on with the competent authority.
<p>3) A notice, notice board or advertisement referred to in sub-regulation (2) must -</p> <ul style="list-style-type: none"> a. give details of the Application or proposed application which is subjected to Public Participation; and b. state - <ul style="list-style-type: none"> i. whether Basic Assessment or S&EIR procedures are being applied to the Application; ii. the nature and location of the activity to which the application relates; iii. where further information on the Application or proposed application can be obtained; and iv. the manner in which and the person to whom representations in respect of the application or proposed application may be made. 	All notice boards will be placed in terms of this requirement and no deviation or additional actions in terms of regulation.
<p>(4) A notice board referred to in sub-regulation (2) must-</p> <ul style="list-style-type: none"> a. be of a size at least 60cm by 42cm; and, b. display the required information in lettering and in a format as may be determined by the Competent Authority. 	All notice boards have complied with this requirement.
<p>(5) Where Public Participation is conducted in terms of this Regulation for an Application or proposed Application, sub-regulation (2)(a), (b), (c) and (d) need not be complied with again during the additional Public Participation Process contemplated in regulations 19(1)(b) or 23(1)(b) or the Public Participation Process contemplated in Regulation 21(2)(d), on condition that -</p> <ul style="list-style-type: none"> a. such process has been preceded by a Public Participation Process which included compliance with sub-regulation (2)(a), (b), (c) and (d); and, b. written notice is given to Registered Interested and Affected Parties regarding where the - 	This will be complied with if final reports are produced during the EIA process.

PUBLIC PARTICIPATION PROCESS REGULATED REQUIREMENT	PROPOSED ACTIONS
<ul style="list-style-type: none"> i. revised Environmental Impact Assessment or, EMPr or Closure Plan, as contemplated in Regulation 19(1)(b); ii. revised Environmental Impact Report or EMPr as contemplated in Regulation 23(1)(b);or iii. Environmental Impact Report and EMPr as contemplated in Regulation 21(2)(d); may be obtained, the manner in which and the person to whom representations on these reports or plans may be made and the date on which such representations are due. 	
<p>6) When complying with this Regulation, the person conducting the Public Participation Process must ensure that -</p> <ul style="list-style-type: none"> information containing all relevant facts in respect of the Application or proposed Application is made available to potential Interested and Affected Parties; and, a. b. participation by potential or Registered Interested and Affected Parties is facilitated in such a manner that all potential or Registered Interested and Affected Parties are provided with a reasonable opportunity to comment on the Application or proposed Application. <p>(7) Where an Environmental Authorisation is required in terms of these Regulations and an Authorisation, Permit or Licence is required in terms of a specific environmental management Act, the Public Participation Process contemplated in this Chapter may be combined with any Public Participation Processes prescribed in terms of a specific environmental management Act, on condition that all relevant Authorities agree to such combination of processes.</p>	<p>An Environmental Authorisation and WULA is required in terms of the NEMA and NWA. All reports will be submitted to relevant authorities and I&APs, that will be informed of such combination of processes that will be subject to public participation.</p>

9.4 NOTIFICATION OF AVAILABILITY OF DRAFT SCOPING REPORT

All registered I&As will be notified of the availability of the DSR for review and comment. This DSR is available for a 30-day review and comment period extending from **August 2022 – 16 September /2022**.

9.5 COMMENTS AND RESPONSES ON DRAFT SCOPING REPORT

All comments and/or issues raised by I&As on this DSR will be considered, responded to and included in the FSR.

9.6 AVAILABILITY OF DRAFT SCOPING REPORT

The draft scoping report will be available for a 30-day comment period extending from **17 August 2022 – 16 September 2022**. Copies of the report will be available at the following locations:

- Enviroworks Website: www.enviroworks.co.za; and,
- Direct download link or attachment.

All notifications (including the site notice and advert) have made provisions for potential I&As to contact Enviroworks, should they not have access to the digital platforms provided. In such instances, Enviroworks will arrange other suitable mechanisms for I&As to be able to access the relevant information.

10 DESCRIPTION OF ENVIRONMENTAL ISSUES AND IMPACTS IDENTIFIED

The aim of the Scoping Report was to identify any potential biophysical and social impacts, associated with the proposed development and then recommend the relevant specialist assessments to be undertaken during the EIA phase. This will take place within the framework of Enviroworks' professional assessment, as well as from the input of specialists and authorities.

In addition to the above, the DEFFA Screening tool (Appendix B) was used to determine various theme sensitivities within the proposed development footprint. Based on protocols (as stipulated in Government Notices No. 320), the level (Low, Medium, High, or Very high) of these sensitivities needs to be confirmed or disputed by a site verification undertaken by an environmental assessment practitioner or a specialist. This will be done in the EIA phase. Following the site verification, a Compliance Statement or Full Impact assessment needs to be compiled based on the sensitivity level of each theme. Where the protocols were not followed i.e. not compiling a Compliance Statement or conducting a Full Impact Assessment was not done, valid and detailed reasons, based on the site verification, need to be provided in the EIR.

The various theme sensitivities, and potential biophysical and social impacts were identified by means of:

- Review of available literature,
- Desktop screening assessments (Appendix C)
- Preliminary Specialist input.

A broad range of potential environmental impacts that may have a significant impact on the environment have been identified during this Final Scoping Process. The potential impacts are likely to present themselves during the three main phases of the project life cycle namely;

Construction phase: these potential impacts are likely to be mainly localised and generally of high significance if un-mitigated, but could be reduced to low significance if mitigation measures and environmental management practices are implemented;

Operational phase: this phase is unlikely to have more significant and substantive impacts if mitigated and managed; and,

Decommissioning phase: these impacts are very similar to those of the operational phase, they will be generally localised with low significant impacts

All the potential impacts identified will be subjected to further investigation during the Environmental Impact Reporting phase, by means of the Methodology described in Section 11.

10.1 POTENTIAL ENVIRONMENTAL IMPACTS

In this section, the potential impacts and associated risk factors that may be generated by the development are identified.

The construction and operation of Photovoltaic modules on a large scale can result in negative local environmental impacts e.g. on landscapes and sustainable land use (including protected areas, etc.). The negative environmental impacts from solar energy installations are much lower in intensity than those produced by conventional energies, but they still have to be assessed and mitigated.

On the other hand, solar generated power also has a number of positive impacts when considering the greater scheme of electricity generation. One of these is the fact that solar power is one of the cleanest renewable resources available. So while many of the negative impacts may be on a local scale, the positive impacts may have a global reach. This chapter discusses the impacts (negative and positive) likely to be associated with the project.

In order to identify and effectively assess the potential environmental impacts of the proposed development, an environmental screening criteria checklist was used and completed as follow.

Table 10: Identification of Potential Impacts

NO.	CRITERIA	YES	NO	DESCRIPTION AND COMMENTS
1. SURFACE WATER AND GROUNDWATER				
1.1	Negative effect on surface water quality and water flow.	Yes	-	<ul style="list-style-type: none"> The project could involve construction or decommissioning activities within surface watercourses during construction; Surface water turbidity, EC, and TDS may be increased by the erosion of construction areas (limited to construction and decommissioning phases only); The construction and operation of the development will not involve any abstraction of water from a watercourse and will also not involve the usage or storage of significant amounts of water; and, Surface runoff patterns will not be significantly altered by the project. During operational phase and in the event of containment failure of the BESS, or in the event of a fire, the molten electrolyte (sulphuric acid-based solution) or sodium hydroxide may contaminate the soil and groundwater.

1.2	Negative effect on groundwater quality and water flow.	Yes	-	<ul style="list-style-type: none"> The project will not involve any groundwater abstraction, yet; There is potential for groundwater contamination due to accidental spills of hazardous substances during the construction, maintenance, and decommissioning phases of the project; and, The impact on groundwater quality and flow is therefore likely to be of very low significance. During operational phase and in the event of containment failure of the BESS, or in the event of a fire, the molten electrolyte (sulphuric acid based solution) or sodium hydroxide may contaminate the soil and groundwater.
2. SOILS (GEOLOGY) AND TOPOGRAPHY				
2.1	Negative impact of soils.	Yes	-	<ul style="list-style-type: none"> The project will involve the construction of concrete foundations, in some instances where required, for the PV panels and other site associated infrastructure, which is likely to have impact on topsoil loss, compaction of soils and soil erosion; Although the total area to be disturbed (foundation footprint) is minimal compared to typical construction sites, mitigation measures will have to be put in place to manage these impacts; and, The more significant impact on soils, will come from clearing activities, the construction of roads, and trenches for the cabling.
2.2	Loss of agricultural land-use.	Yes	No	<ul style="list-style-type: none"> Land will be occupation by PV panels and associated infrastructure, for the duration of the project in all the phases of the project; Positive impacts include the enhanced agricultural potential through increased financial security for farming operations, and improved security against stock theft and other crime.
2.3	Soil erosion due to alteration of the surface run-off characteristics.	Yes	-	<ul style="list-style-type: none"> Alteration of run-off characteristics may be caused by construction related land surface disturbance, vegetation removal, the establishment of hard standing areas and

				roads, and the presence of panel surfaces. Erosion will cause loss and deterioration of soil resources and may occur during all phases of the project.
3. ECOLOGICAL IMPACT				
3.1	Negative impact on vegetation and fauna.	Yes	-	<ul style="list-style-type: none"> The project will entail vegetation clearance and ground cover clearing during the construction phase. This is likely to have some form of impact on vegetation and fauna on the site; A detailed Ecological Impact Assessment will be undertaken to determine the significance of this impact; and, However, from the site visits undertaken as part of the Scoping Report, the site appears to be in an already transformed or impacted state.
3.2	Negative impact on wetlands and riparian vegetation.	-	No	<ul style="list-style-type: none"> The project site has wetlands and watercourses, the ecological impact investigation will be conducted to report findings; and, The development layout avoids significant sensitive areas, which shall be deemed as NO-GO areas. Suitable buffer areas were assigned to sensitive wetland and marshy areas that should be maintained during the construction and operational phase.
3.3	Negative impact on Birds and Avian Species.	-	No	<ul style="list-style-type: none"> Solar PV projects are not known to have negative impacts on birds, however, a study will still be undertaken, even though layout avoids significant sensitive areas.
4. HERITAGE IMPACT				
4.1	Negative impact on graveyards, rock art, historical buildings, archaeological site and artefacts etc.	-	No	<p>Sites or features of heritage, archaeological and cultural importance observed within the greater area were identified and buffers assigned and incorporated into the layout plan to avoid; and,</p> <p>A Heritage Impact Assessment will be conducted during the EIA phase in order to confirm this.</p>

5. NOISE IMPACT				
5.1	Negative impact on of noise on surrounding receptors (residential areas, institutions, and business sites).	Yes	-	<ul style="list-style-type: none"> The construction of the PV structures is likely to have some noise impact on the surrounding but there are generally no sensitive receptors near the site; and, The Operational phase of Solar PVs is not known to have any significant noise impact.
6. VISUAL IMPACT				
6.1	Negative impact on Aesthetically pleasing and scenic landscape.	Yes	-	<ul style="list-style-type: none"> The construction of PV structures is likely to have some impact on the viewscape especially since the site is located in a fairly rural natural landscape; The PV panel are generally located at heights close to the ground level and might not be visible from far distances; and, This issue will be addressed by a visual impact assessment.
7. SOCIO-ECONOMIC IMPACT				
7.1	Negative impact on neighbourhood and community character.	Yes	-	<ul style="list-style-type: none"> There are currently no PV facilities in the area so neighbourhood and community character will change the agricultural and rural character of the community; and, However, it is important to note that neighbourhood or community effects are subjective in nature.
7.2	Negative impact on local businesses, institutions or public facilities.	Yes	No	<ul style="list-style-type: none"> Potential impacts anticipated on tourism in the immediate local and regional area will be investigated in more detail by the Socio-Economic Assessment and during PPP.
7.3	Impact on local Tourism.	Yes	No	<ul style="list-style-type: none"> Potential impacts anticipated on tourism in the immediate local and regional area will be investigated in more detail by the Socio-Economic Assessment and during PPP.
7.4	Negative impact on the local economy or the municipal economy.	-	No	<ul style="list-style-type: none"> No negative impact anticipated, but rather a positive economic impact as a result of increased tax base, job creation, increased capacity of electricity in the area, especially green power; Job opportunities will involve about three thousand (5 000) man-months during the 18 months construction phase and

				<p>approximately 15-20 full time individuals during the 25 years or even up to 30 years of operation;</p> <ul style="list-style-type: none"> Reliable income will be generated by the farming enterprises through the lease of the land to the energy facility; Likely to improved security against stock theft and other crime; and, A Socio-Economic Assessment will be undertaken.
8. TRAFFIC IMPACT				
8.1	Negative impact on traffic.	Yes	-	<ul style="list-style-type: none"> During construction and decommissioning, delivery and removal of equipment to the site will result in a temporary increase in local traffic; and, The operational phase is not likely to have any significant impact on local traffic.
8.2	Negative impact on public health and safety.	Yes	-	<ul style="list-style-type: none"> Health and Safety risk related to construction work and electrical installation will be possible during the construction and decommissioning phase; Mitigation measures based on Occupational Health and Safety Act, will be put in place to manage these risks; and, All power generation and electrical installations have significant health and safety risks. However, this facility will be a high security and controlled access facility to ensure that any unauthorised person does not access it.

*Yes = Means the impact is identified as a potential impact and shall be discussed further at EIA Phase.

10.2 POTENTIAL SIGNIFICANT IMPACTS'

Further to the above issues, the following key environmental impacts emerged as the more pertinent and substantive issues.

10.2.1 IMPACT OF VEGETATION LOSS AND DISTURBANCE OF HABITATS

The installation of the solar PV modules arrays, and associated infrastructure, is likely to result in the loss of vegetation and disturbance of habitats, and this can consequently affect, alter and/or fragment ecosystems on the site. Although some parts of the site have already been transformed or disturbed through agriculture, there are areas which may still be intact, and active ecosystems on the site. These important habitats could be affected

if due care in the planning and implementation of mitigation measures, to avoid negative impacts, is not taken during the project phases. The vegetation or land cover of certain areas will be cleared for the various infrastructures on site during the construction period.

Taking into consideration the sensitivity of the development footprint, sensitive features verified during the site inspection, the results from the baseline biodiversity and ecosystem of the site, it can be concluded that most of the proposed development sites may have some ecological sensitivity (Animal Species, Plant Species or Terrestrial Biodiversity). Nevertheless, the preliminary 'no-go' areas will be identified to ensure the preservation of the ecological importance of the habitat units within the proposed development footprints (this pending further assessments to determine the full extent of the impact of the proposed developments).

10.2.2 VISUAL IMPACT

Landscape perceptions and visual impacts are key environmental issues in determining the type and position of the solar energy facilities, as landscape and visual impacts are by nature subjective and changing over time and location. The PV modules, depending on the location and topographical features, have the potential of attracting people's attention. PV Solar facilities spread over an area may become dominant points within the landscape, and may cause negative landscape and visual effects. The key features of these facilities including (location, landscape, size, height, number, material and colour), access and site tracks, substation buildings, compounds, grid connection, anemometer masts, and transmission lines, are critical to determining the visual impact. However, an important characteristic of these facilities is that they permanently transform only a very small footprint, so the area where the PVs have been located can return to its original condition after the decommissioning phase.

Some of the techniques commonly used to inform the landscape and visual impact assessment are:

- Zone of Theoretical Visibility (ZTV) maps define the areas from which a solar plant can be totally or partially seen as determined by topography;
- These areas represent the limits of visibility of the plant; and,
- Photographs to record the baseline visual resource.
- Mitigation measures to prevent and or minimize visual impact on landscape can be devised.

The construction of PV structures is likely to have some impact on the viewscape especially since the site is located in a fairly rural natural landscape. The PV panel are generally located at heights close to the ground level and might not be visible from far distances. This issue will be addressed by a high-level visual impact assessment study.

10.2.3 NOISE IMPACT

Apart from the construction phase, the operation of the proposed Solar PV project is not likely to generate any significant Noise. Therefore, in this case we do not consider Noise as a significant potential aspect and hence no detailed Noise Impact Assessment will be undertaken during the EIA phase.

10.2.4 IMPACT ON AVIFAUNA

The preliminary site assessment revealed that the solar panels will be located on old farmlands that consist of overgrown vegetation. The area has several pans that attract a potential variety of waterfowl, including migrants. This makes the waterbodies an important habitat that will be assessed during the EIA phase.

10.2.5 IMPACT ON LAND USE AND VALUE

Two potential negative agricultural impacts were identified, loss of agricultural land use, and land degradation. Two positive agricultural impacts were identified as enhanced agricultural potential through increased financial security for farming operations, and improved security against stock theft and other crime. The impact assessment of these issue will be addressed by a high-level visual impact assessment socio-economic impact study during the EIA Phase.

10.2.6 IMPACT ON AQUATIC ECOLOGY

It is the preliminary opinion of the specialist (EcoFocus Consulting, 2022), by application of the National Environmental Management Act (Act No. 107 of 1998) Mitigation Hierarchy, that there may be potentially significant aquatic ecological impacts associated with the proposed development site. But that these can be suitably reduced and mitigated to within acceptable residual levels, by implementation of the recommended buffer zones and comprehensive mitigation measures that will be provided in the full Aquatic Ecological Assessment Report. This will be addressed in the EIR..

10.3 CUMULATIVE AND INDIRECT IMPACTS

This section describes the likely cumulative impacts of the project on the environment. It identifies the scope of the assessment, the potential cumulative environmental effects, which may require associated mitigation measures to be addressed during the EIA phase.

10.4 CUMULATIVE IMPACTS

Cumulative impacts are those Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project (EU, 1999). The table below shows the various impacts, which shall be considered for cumulative impact assessment during the EIA phase of the proposed project.

Table 11: Potential Cumulative impacts.

POTENTIAL IMPACT	CONSIDERED FOR POTENTIAL CUMULATIVE IMPACT
Air Quality	No
Archaeological and Cultural Heritage	No
Palaeontological	No
Avian	No
Bats	No
Flora	No
Fauna	Yes
Surface and Groundwater	Yes
Visual Impact	Yes
Noise Impact	No

Traffic	No
Land-use	Yes
Local Economy	Yes
Health and Safety	No
Telecommunications and Civil Aviation	No
Tourism	No

10.5 INDIRECT IMPACTS

Indirect Impacts on the environment are those impacts, which are not a direct result of the project, often produced away from or as a result of a complex pathway. Sometimes referred to as second or third level impacts, or secondary impacts.

The proposed project will not only supply renewable electricity to the National grid, but also contribute to the sustainable development of the local community. This includes the supply of zero-emitting renewable energy to the national grid, saving the coal and water resources and improving the local energy infrastructure. Very few direct new jobs will be created by solar energy during their operation. However, both skilled and unskilled labour is required during the construction of supporting service infrastructure

11 PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

In compliance with section (i) of Appendix 2 of regulation 982, the following plan of study for undertaking the Environmental Impact Assessment Report is provided. In terms of these regulations the following must be included in this plan of study.

- (i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;
- (ii) a description of the aspects to be assessed as part of the environmental impact assessment process;
- (iii) aspects to be assessed by specialists;
- (iv) a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;
- (v) a description of the proposed method of assessing duration and significance;
- (vi) an indication of the stages at which the competent authority will be consulted;
- (vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and
- (viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;
- (ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

11.1 DESCRIPTION OF THE ALTERNATIVES TO BE CONSIDERED AND ASSESSED

Please refer to section 7 where Alternatives have been considered in this Scoping Report and where relevant will be assessed in the environmental impact reporting phase.

As mentioned earlier in the report (section 7.2), the intention of environmental impact assessment is to assess various alternatives including activity, site placement, layout, technology and “Do-Nothing” options.

Alternatives will be assessed by the EAP with input from the participating specialists.

11.2 SPECIALIST STUDIES

Typically, during the EIA phase specialists may be required to undertake further specific investigations on the key issues and impacts identified during the scoping phase. The Specialist studies will then form part of the EIA and informs the impact statement. In the case of this Scoping and EIA for the proposed Khauta North SPV Facility, the following Specialist studies will be undertaken as identified in the DFFE Screening Tool Report (Appendix B).

Table 12: Sensitivity of the environmental themes and studies to be undertake in terms of these sensitivities

ENVIRONMENTAL THEME	SENSITIVITY	REQUIRED INVESTIGATION	DISCUSSION / COMPLIANCE
Agriculture Theme	High	Agricultural Compliance Statement	An Agricultural Compliance Statement shall be submitted as part of the EIA process as outlined in the Plan of Study for EIA.
Animal Species Theme	Low Subject to confirmation	Terrestrial Animal Species Compliance Statement	A Terrestrial Animal Species Compliance Statement will be submitted as part of the EIA process as outlined in the Plan of Study for EIA.
Aquatic Biodiversity Theme	Low	Aquatic Biodiversity Compliance Statement	An Aquatic Biodiversity Compliance Statement will be submitted as part of the EIA process as outlined in the Plan of Study for EIA.
Archaeological and Cultural Heritage Theme	Low	Archaeological Heritage Impact Assessment	An Archaeological Heritage Impact Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA
Avian Theme	Low	Avifaunal Impact Assessment	Although assigned a low sensitivity for SPV developments, an Avifaunal Impact Assessment will be undertaken as part of the EIA phase, due to the surrounding water resources and potential flight collision risks in terms of the proposed 32/44 kV and 33/132kV transmission lines.
Civil Aviation (Solar PV) Theme	Low	No investigation required.	No significant impacts on the civil aviation installation are expected in low sensitivity areas. It is unlikely for further assessment and mitigation measures to be required.
Defence Theme	Low	No investigation required.	No negative impacts on the defence installation are expected in low sensitivity areas. It is unlikely for further assessment and mitigation measures to be required.
Landscape (Solar) Theme	Very High	Specialist assessment	A Visual Impact Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA.
Palaeontology Theme	High	Specialist assessment	Will form part of the Archaeological Heritage Impact Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA

ENVIRONMENTAL THEME	SENSITIVITY	REQUIRED INVESTIGATION	DISCUSSION / COMPLIANCE
Plant Species Theme	Low	Terrestrial Plant Species Compliance Statement	A Terrestrial Plant Species Compliance Statement shall be submitted as part of the EIA process as outlined in the Plan of Study for EIA
RFI Theme	Low	Compliance Statement	Not to be undertaken – The SKA declared area is approximately 615km southwest of the project site. Considering the distance, the project is unlikely to have any impact on the SKA. The South African SKA Project Office and SARAO have been registered as a key stakeholder on this environmental process and will be given the opportunity to provide comments and input in terms of the Astronomy Geographic Advantage Act and potential impact to SKA.
Terrestrial Biodiversity Theme	Very High	Terrestrial Biodiversity Specialist Assessment	A Terrestrial Biodiversity Specialist Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA.
Geotechnical Assessment	Other	Specialist assessment	A Desktop Geotechnical Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA.
Socio-Economic Assessment	Other	Specialist assessment	A Socio-Economic Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA.

The following specialists and specialist studies have been appointed to undertake the specialist studies during the Environmental Impact Assessment Phase.

Table 13: Specialist studies during the Environmental Impact Assessment Phase

SPECIALIST ASSESSMENT	SPECIALIST
Avifaunal Assessment	Mokgatla Molepo (Pri.Nat.Sc.) from Moira Ecological Services (Pty) Ltd
Agricultural Assessment	Dr Johann Lanz (Pri.Nat.Sc.)
Terrestrial & Aquatic Ecological Assessment	Rikus Lamprecht (Pri.Nat.Sc.) from EcoFocus Consulting (Pty) Ltd
Economic Specialist	Petrus J van Jaarsveld (ESSA #0116)

SPECIALIST ASSESSMENT	SPECIALIST
Heritage and Archaeological Assessment	Jonathan Kaplan from Agency for Cultural Resource Management (ACRM)
Palaeontological Assessment	Dr John Almond from Natura Viva CC
Terrestrial Biodiversity, Plant- and Animal Species Assessment	Mr Roy de Kock M.Sc (Pri.Nat.Sc.) from Blue Leaf Environmental (Pty) Ltd. Megan Smith M.Sc Biological Sciences (EAPASA: Registered EAP) from Enviroworks.
Socio-economic Impact Assessment	Michael Leach (EAPASA Reg: 2021/3872) from Enviroworks
Visual Impact Assessment	Christoff du Plessis from Enviroworks
Geo-technical Assessment	BVi Consulting Engineers Western Cape (Pty) Ltd

11.3 TERMS OF REFERENCE FOR SPECIALIST STUDIES

11.3.1 GENERAL TERMS OF REFERENCE

The specialist studies identified in Table shall at the minimum adhere to the following Terms of Reference while conducting their studies:

Address issues raised by I&APs, as contained in the IRR, and conduct an assessment of all potentially significant impacts.

Any additional issues that have not been identified during Scoping should also be highlighted to the EAP for further investigations.

Approach to include desktop study and site visits, as deemed necessary, to understand the affected environment and to adequately investigate and evaluate significant issues. Indigenous knowledge (i.e. targeted consultation) should also be regarded as a potential information resource.

Assess the impacts (direct, indirect and cumulative) in terms of their significance (using suitable evaluation criteria) and suggest suitable mitigation measures. In accordance with the mitigation hierarchy, negative impacts should be avoided, minimised, rehabilitated (or reinstated) or compensated for (i.e. offsets), whereas positive impacts should be enhanced. A risk-averse and cautious approach should be adopted under conditions of uncertainty.

Consider time boundaries, including short to long-term implications of impacts for project life-cycle (i.e. pre-construction, construction, operation and decommissioning).

Consider spatial boundaries, including:

Broad context of the proposed project (i.e. beyond the boundaries of the specific site);

Off-site impacts; and

Local, regional, national or global context.

The provision of a statement of impact significance for each issue, which specifies whether or not a pre-determined threshold of significance (i.e. changes in effects to the environment, which would change a significance rating) has been exceeded, and whether or not the impact presents a potential fatal flaw or not. This statement of significance should be provided for anticipated project impacts both before and after application of impact management actions.

Recommend a monitoring programme to implement mitigation measures and measure performance.

List indicators to be used during monitoring.

Appraisal of alternatives (including the No-Go option) by identifying the Best Practicable Environmental Option (BPEO) with suitable justification.

Advice on the need for additional specialists to investigate specific components and the scope and extent of the information required from such studies.

Engage with other specialists whose studies may have bearing on their specific investigation.

Present findings to the EAP project team, where key discussion points will include the evaluation of alternatives, recommended management measures and monitoring programme.

Information provided to the EAP needs to be signed off.

Review and ensure that specialist information has been interpreted and integrated correctly into the EIA report.

The appointed specialists must take into account the policy framework and legislation relevant to their particular studies.

Use the assessment criteria for impact assessment and assigning significance as provided by the EAP.

All specialist reports must adhere to section 32 ("specialist reports and reports on specialised processes") of the EIA Regulations, 2014 (as amended) as part of the EIA Report.

The specialist report must be prepared in terms of Appendix 6 of the Environmental Impact Assessment Regulations, 2014 (as amended); or where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.

11.3.2 TERRESTRIAL PLANT SPECIES ASSESSMENT

The Ecological Specialist shall over and above the general terms of reference stipulated above, shall submit, subject to confirmation, an Aquatic Biodiversity Compliance Statement to fulfil the requirements of the -

- Protocol for the criteria for the assessment and reporting of impacts on terrestrial plant species for activities requiring environmental authorisation, as Published in GN No. 1150, Government Gazette 43855 (20 March 2020).

11.3.3 TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT

The Terrestrial Biodiversity Specialist shall over and above the general terms of reference stipulated above, undertake studies to fulfil the requirements of the -

- Protocol for the criteria for the assessment and reporting of impacts on terrestrial biodiversity for activities requiring environmental authorisation, as Published in GN No. 320 ,Government Gazette 43110 (20 March 2020).
- This protocol replaces the requirements of Appendix 6 of the EIA Regulations, 2014 (as amended).

11.3.4 AQUATIC BIODIVERSITY IMPACT ASSESSMENT

The Aquatic Biodiversity Specialist shall over and above the general terms of reference stipulated above, must submit an Aquatic Biodiversity Compliance Statement to fulfil the requirements of the-

- Protocol for the criteria for the assessment and reporting of impacts on aquatic¹⁴ biodiversity for activities requiring environmental authorisation, as Published in GN No. 320 ,Government Gazette 43110 (20 March 2020).

11.3.5 PALEONTOLOGICAL IMPACT ASSESSMENT

The Palaeontologist shall over and above the general terms of reference stipulated above, undertake:

Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration identified by the DFFE screening tool where determined, must be confirmed by undertaking a site sensitivity verification.

The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.

The site sensitivity verification must be undertaken through the use of:

- a desk top analysis, using satellite imagery;
- a preliminary on-site inspection; and
- any other available and relevant information.

The outcome of the site sensitivity verification must be recorded in the form of a report that—

- confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
- contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
- is submitted together with the relevant assessment report prepared in accordance with the requirements of the EIA Regulations, 2014 (as amended).

Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.

¹⁴ 1 Aquatic is defined as inland aquatic and estuaries/estuarine systems where plants and animals live.

11.3.6 ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT

The Archaeological and Cultural Heritage Specialist shall over and above the general terms of reference stipulated above, undertake -

Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration identified by the DFFE screening tool where determined, must be confirmed by undertaking a site sensitivity verification.

The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.

The site sensitivity verification must be undertaken through the use of:

- a desk top analysis, using satellite imagery;
- a preliminary on-site inspection; and
- any other available and relevant information.

The outcome of the site sensitivity verification must be recorded in the form of a report that—
 confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
 contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
 is submitted together with the relevant assessment report prepared in accordance with the requirements of the EIA Regulations, 2014 (as amended).

Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.

Paleontology Theme High Specialist assessment Will form part of the

11.3.7 AGRICULTURAL IMPACT ASSESSMENT

The Agricultural Impact Assessment Specialist shall over and above the general terms of reference stipulated above, undertake studies to fulfil the requirements of the -

Protocol for undertaking site sensitivity verification, specialist assessment and minimum report content requirements for environmental impacts on agricultural resources by solar photovoltaic (PV) energy generation facilities where the electricity output is 20 megawatts or more as Published in GN No. 320 ,Government Gazette 43110 (20 March 2020).

11.4 OTHER SPECIALIST STUDIES

The Socio-economic Impact Assessment, Avifaunal Impact Assessment, Aquatic Impact Assessment and the Visual Impact Assessment Specialist studies shall over and above the general terms of reference stipulated above, be in forms of high-level impact assessments as these issues have been considered to be important but not critical or significant potential impacts.

11.5 IMPACT ASSESSMENT METHODOLOGY

The impacts will be evaluated by applying the methodology as described below. The impact is defined and the significance is rated from Low to High as indicated in the table below with an explanation of the impact magnitude and a guide that reflects the extent of the proposed mitigation measures deemed necessary.

For each potential impact, the **EXTENT** (Spatial scale), **MAGNITUDE** (degree of the impact), **DURATION** (time scale), **IRREPLACEABILITY** (loss of resources) and the **REVERSIBILITY** (degree to which the proposed impact can be reversed) and **PROBABILITY** (occurrence) will be assessed by the EAP as well as the Specialists. The assessment of the above criteria will be used to determine the significance of each impact, with and without the implementation of the proposed mitigation measures. The scale to be used to assess these variables and to define the rating categories are tabulated in the Tables below.

Table 14: Evaluation Components, Ranking Scales And Descriptions (Criteria)

Evaluation component	Ranking scale and description (criteria)
MAGNITUDE of NEGATIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high: Bio-physical and/or social functions and/or processes might be <i>severely</i> altered.</p> <p>8 - High: Bio-physical and/or social functions and/or processes might be <i>considerably</i> altered.</p> <p>6 - Medium: Bio-physical and/or social functions and/or processes might be <i>notably</i> altered.</p> <p>4 - Low : Bio-physical and/or social functions and/or processes might be <i>slightly</i> altered.</p> <p>2 - Very Low: Bio-physical and/or social functions and/or processes might be <i>negligibly</i> altered.</p> <p>0 - Zero: Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high (positive): Bio-physical and/or social functions and/or processes might be <i>substantially</i> enhanced.</p> <p>8 - High (positive): Bio-physical and/or social functions and/or processes might be <i>considerably</i> enhanced.</p> <p>6 - Medium (positive): Bio-physical and/or social functions and/or processes might be <i>notably</i> enhanced.</p> <p>4 - Low (positive): Bio-physical and/or social functions and/or processes might be <i>slightly</i> enhanced.</p> <p>2 - Very Low (positive): Bio-physical and/or social functions and/or processes might be <i>negligibly</i> enhanced.</p> <p>0 - Zero (positive): Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
DURATION	<p>5 – Permanent</p> <p>4 - Long term: Impact ceases after operational phase/life of the activity > 60 years.</p> <p>3 - Medium term: Impact might occur during the operational phase/life of the activity – 60 years.</p> <p>2 - Short term: Impact might occur during the construction phase - < 3 years.</p> <p>1 – Immediate</p>
EXTENT (or spatial scale/influence of impact)	<p>5 - International: Beyond National boundaries.</p> <p>4 - National: Beyond Provincial boundaries and within National boundaries.</p> <p>3 - Regional: Beyond 5 km of the proposed development and within Provincial boundaries.</p> <p>2 - Local: Within 5 km of the proposed development.</p> <p>1 - Site-specific: On site or within 100 m of the site boundary.</p> <p>0 – None</p>
IRREPLACEABLE loss of resources	<p>5 – Definite loss of irreplaceable resources.</p> <p>4 – High potential for loss of irreplaceable resources.</p> <p>3 – Moderate potential for loss of irreplaceable resources.</p> <p>2 – Low potential for loss of irreplaceable resources.</p> <p>1 – Very low potential for loss of irreplaceable resources.</p> <p>0 – None</p>

Evaluation component	Ranking scale and description (criteria)
REVERSIBILITY of impact	<p>5 – Impact cannot be reversed.</p> <p>4 – Low potential that impact might be reversed.</p> <p>3 – Moderate potential that impact might be reversed.</p> <p>2 – High potential that impact might be reversed.</p> <p>1 – Impact will be reversible.</p> <p>0 – No impact.</p>
PROBABILITY (of occurrence)	<p>5 - Definite: >95% chance of the potential impact occurring.</p> <p>4 - High probability: 75% - 95% chance of the potential impact occurring.</p> <p>3 - Medium probability: 25% - 75% chance of the potential impact occurring</p> <p>2 - Low probability: 5% - 25% chance of the potential impact occurring.</p> <p>1 - Improbable: <5% chance of the potential impact occurring.</p>
Evaluation component	Ranking scale and description (criteria)
CUMULATIVE impacts	<p>High: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Medium: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Low: The activity is localized and might have a negligible cumulative impact.</p> <p>None: any cumulative impact on the environment.</p>

Once the evaluation components have been ranked for each potential impact, the significance of each potential impact will be assessed (or calculated) using the following formula:

$$\bullet \text{ SP (Significance Points) = (Magnitude + Duration + Extent + Irreplaceability + Reversibility) x Probability}$$

The maximum value is 150 SP (Significance Points). The unmitigated and mitigated scenarios for each potential environmental impact should be rated as per **Table 7** below.

Significance Points	Environmental Significance	Description
125 – 150	Very high (VH)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	High (H)	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	Medium-high (MH)	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked.
40 – 74	Medium (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

Once the evaluation components have been ranked for each potential impact, the significance of each potential impact will be assessed (or calculated) using the following formula:

- The maximum value is 150 SP (Significance Points). The unmitigated and mitigated scenarios for each potential Environmental Impact should be rated as per the Table below. Impacts are then presented in the following format:

Table 15: Illustration of the Impact Rating Tables to be used during the EIR Phase.

Planning, design and construction phase	Layout Alternative 1		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL VISUAL IMPACTS:					
Nature of impact:	Activity:				
Magnitude:					
Duration:					
Extent:					
Irreplaceable:					
Reversibility:					
Probability:					
Total SP:					
Significance rating:					
Cumulative impact:					
Proposed Mitigation:	•				

11.6 THE CONTENT OF THE EIA REPORT

In terms of the 201EIA regulations, an environmental impact assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include -

- (a) details of –
 - (i) the EAP who prepared the report; and
 - (ii) the expertise of the EAP, including a curriculum vitae;
- (b) the location of the activity, including:
 - (i) the 21 digit Surveyor General code of each cadastral land parcel;
 - (ii) where available, the physical address and farm name; and
 - (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;
- (c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is -
 - (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken;
 - (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;
- (d) a description of the scope of the proposed activity, including -
 - (i) all listed and specified activities triggered and being applied for; and
 - (ii) a description of the associated structures and infrastructure related to the development;
- (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;
- (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;
- (g) a motivation for the preferred development footprint within the approved site;
- (h) a full description of the process followed to reach the proposed development footprint within the approved site, including:
 - (i) details of the development footprint alternatives considered;
 - (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;
 - (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;
- (iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- (v) 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;
- (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;
 - (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
 - (viii) the possible mitigation measures that could be applied and level of residual risk;
 - (ix) if no alternative development locations for the activity were investigated, the motivation for not considering such; and
 - (x) a concluding statement indicating the preferred alternative development location within the approved site;
 - (xi) 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 –
 - (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and
 - (i) an assessment of the significance of each issue and risk and an indication of the extent to
 - (ii) which the issue and risk could be avoided or addressed by the adoption of mitigation measures;
 - (j) an assessment of each identified potentially significant impact and risk, including-
 - (i) cumulative impacts;
 - (ii) the nature, significance and consequences of the impact and risk;
 - (iii) the extent and duration of the impact and risk;
 - (k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;
 - (l) an environmental impact statement which contains –
 - (i) a summary of the key findings of the environmental impact assessment;
 - (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and
 - (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

- (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;
- (n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;
- (o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation
- (p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;
- (q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
- (r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;
- (s) an undertaking under oath or affirmation by the EAP in relation to:
 - (i) the correctness of the information provided in the reports;
 - (ii) the inclusion of comments and inputs from stakeholders and I&APs;
 - (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and
 - (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;

The Environmental Impact Report for the proposed Khauta North SPV Facility energy facility will consider and comply with the legislated requirements.

11.7 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Programme (EMPr) will be compiled in accordance with Regulation 33 of the EIA Regulations, 2014 (as amended). The EMPr will form an appendix to the Draft EIR and will provide practical management measures to be introduced in order to ensure that impacts as a result of the proposed projects are minimised and prevented where possible.

The EMP will include a detailed Construction, Operational and Maintenance Plan for the new solar facility and shall be prepared and submitted together with the Draft EIR. At the minimum the EMP must include the following:

- Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that are identified in the EIR, including environmental impacts or objectives in respect of planning and design, pre-construction and construction activities, operation or undertaking of the activities, rehabilitation of the environment and closure where relevant;
- A detailed description of the aspects of the activity that are covered by the draft EMP;
- An identification of the persons who will be responsible for the implementation of the measures;

- Proposed mechanisms for monitoring compliance with the EMP and reporting thereon;
- As far as possible, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity, to its natural or predetermined state, or to a land use that conforms to the generally accepted principle of sustainable development, including where appropriate, concurrent or progressive rehabilitation measures;
- A description of the manner in which it intends to modify, remedy activities causing pollution or environmental degradation and how it will comply with prescribed environmental management standards and provision of any relevant Acts;
- Time periods within which the measures contemplated in the EMP must be implemented;
- The process for managing any environmental damage, pollution, ecological degradation as a result of undertaking a listed activity;
- An environmental awareness plan describing the manner in which the applicant will inform his or her employees of environmental risk and how risk must be dealt with to avoid pollution; and
- Where appropriate, closure plans, including closure and rehabilitation objectives.
- An environmental impact statement, which contains a summary of the key findings of the environmental impact assessment, a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives;
- Copies of any specialist reports and reports on specialised processes; and
- Any specific information that may be required by the competent authority.

11.8 MITIGATION OF IMPACTS

This section highlights the mitigation measures recommended in the Environmental Impact Assessment Guideline for Renewable Energy in terms of section 24J of the NEMA, published on 16 October 2016. In terms of the above-mentioned guideline, an IPP project that triggers the need for a Scoping & EIR process under the EIA Regulations, 2014 (as amended), should include project-specific measures designed to mitigate negative impacts and enhance positive impacts, and be informed by good industry practice and are to be included in the Environmental Management Programme (EMPr).

The project-specific measures designed to mitigate negative impacts and enhance positive impacts, potential measures include but are not limited to the following:

- Conduct pre-disturbance surveys as appropriate to assess the presence of sensitive areas, fauna, flora and sensitive habitats; - Refer to the recommendations in the Faunal Survey Report for *Smaug giganteus* (Giant girdled lizards), dated 11 May 2022 (Appendix D6);
- Plan visual impact reduction measures such as natural (vegetation and topography) and engineered (berms, fences, and shades, etc.) screens and buffers;
- Utilise existing roads and servitudes as much as possible to minimise project footprint;
- Site projects to avoid construction too near to pristine natural areas and communities;

- Locate developments away from important habitat for faunal species, particularly species which are threatened or have restricted ranges, and are collision-prone or vulnerable to disturbance, displacement and/or habitat loss;
- Fence sites as appropriate to ensure safe restricted access;
- Ensure dust abatement measures are in place during- and post-construction;
- Develop and implement a Storm Water Management Plan;
- Develop and implement a Waste Management Plan; and,
- Re-vegetation with appropriate indigenous species to prevent dust and erosion, as well as establishment of alien species.

Detailed mitigation measures will be outlined in the EMPr, which will be compiled as part of the EIR phase. Mitigation of impacts in this report will follow the following approach:

- **Avoiding or preventing** the impact through the early consideration of opportunities and constraints and development alternatives (positive planning) and by modifying the proposal accordingly;
- **Reducing or minimising** negative impacts and maximising benefits, by considering alternatives and modifying the proposal;
- **Rectifying** negative impacts by restoring the affected environment to its previous condition, or rehabilitating it for a different land use; and as a 'last resort',
- **Providing an offset to compensate** for the residual negative impact on biodiversity or ecosystem services, by replacing or providing 'like for like or better' substitutes for these impacts. In cases where residual impacts affect threatened, unique or irreplaceable biodiversity, offsets are not an option as substitutes do not exist.

11.9 PUBLIC PARTICIPATION PROCESS DURING EIA

A comprehensive PPP will be conducted in terms of Regulation 982 of NEMA EIA Regulations of 2014 (as amended by in 2017). The PPP is undertaken in a manner that ensures that all interested and affected parties are adequately informed of the proposed development and to ensure that everyone has the opportunity to raise their concerns and/or comments.

11.9.1 PROCESS TO BE FOLLOWED

On approval of the Draft Scoping Report, an Environmental Impact Assessment Report will be compiled and made available for I&AP comment for a 30-day period. Comments on the Impact Assessment Report will be incorporated into a Final Impact Assessment Report that will be submitted to DFFE for a decision. The decision will be communicated to all registered I&APs within 14 days after Environmental Authorisation has been granted. I&AP's will be afforded an opportunity to submit any appeals on the decision.

The proposed project will be brought to the attention of the public by the following means:

- Fixing a notice board at:

- a place conspicuous to and accessible by the public on the proposed development site, and
- another public place
- Giving written notice by the following means:
 - a BID will be given to the landowner and adjacent landowners;
 - a BID and soft copy of the report will be given to any organ of state having jurisdiction in respect of any aspect of the proposed development;
 - a hard copy of the report will be submitted to DFFE; and
 - Placing an advert in one local newspaper.

11.9.2 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

I&APs will be identified primarily through responses received from the site notices and adverts placed for the project. Letters and emails will also be sent to key stakeholders informing them of the application process and indicating how they could become involved in the project. The contact details of all identified I&APs will be captured in a database. This database will be updated on an on-going basis throughout the EIA process.

11.9.3 ISSUES AND RESPONSE REPORT

Issues and concerns raised in the public participation process will be compiled into an Issues and Responses Trail. This will be incorporated and submitted with the Final EIR.

11.9.4 CONSULTATION WITH COMPETENT AUTHORITIES

The competent authorities issuing decisions regarding the project will be consulted and informed about the ongoing PPP for them to comment.

11.9.5 ADVERTISING

In compliance with the EIA Regulations GN R982 (2014) as amended by GN R326 (2017), notification of the commencement of the EIA process for the project will be advertised in English in a local newspaper. I&APs are requested to register their interest in the project and become involved in the EIA process. The primary aim of these advertisements is to ensure that the widest group of I&APs possible is informed and invited to provide input, questions and comments on the project. In addition to advertisements, two A3 size site notices will be placed at the most accessible areas by the community notifying them of the EIA process for the project.

12 WAY FORWARD The envisaged key milestones of the programme for the Environmental Impact Assessment (EIA) phase of the proposed project are outlined in the table below. These are indicative dates for the remainder of the process.

Table 16: Key milestones remaining for the Scoping and EIR process

KEY MILESTONE ACTIVITIES	PROPOSED PROGRAMME
30-day public review period for the Draft Scoping Report	17/08/2022 - 16/09/2022
Undertake detailed specialist studies	21/07/2022 - 15/09/2022
Submission of Final Scoping Report to DFFE	04/10/2022
DFFE acceptance of the final Scoping Report and Plan of Study to undertake EIA.	16/11/2022
30-day public review period for registered I&APs to provide comments on the draft Environmental Impact Report (EIR) and draft Environmental Management Programme (EMPr).	17/01/2023 - 15/02/2023
Submission of final EIR and EMPr to DFFE	10/03/2023
DFFE to review and give decision on Environmental Authorisation	03/07/2023

The Draft Scoping Report and the Draft Environmental Impact Assessment Report, together with all appendices, will be made available on the Enviroworks website (www.enviroworks.co.za) for review. Stakeholders and I&APs are also welcome to call or email the Environmental Assessment Practitioner should any question arise.

I&APs are invited to submit comments on this Scoping Report to:

To: Social Facilitation Specialist:

MICHAEL LEACH

- Email: michael@enviroworks.co.za
- Telephone: 082 598 6500

Cc: Environmental Assessment Practitioner:

ELANA MOSTERT

- Email: elana@enviroworks.co.za
- Telephone: 082 598 6500

13 CONCLUSION AND RECOMMENDATIONS This scoping exercise is currently being undertaken to present concept proposals to the public and potential Interested & Affected Parties and to identify environmental issues and concerns raised as a result of the proposed development to date. This will allow Interested & Affected Parties (I&APs), authorities, the project team, as well as specialists to provide input and raise issues and concerns, based on baseline / scoping studies undertaken. Khauta North SPV Facility has been analysed from Ecological, Agricultural, Heritage, Avifaunal, Social and Visual perspectives, and site constraints and potential impacts identified.

This Final Scoping report summarises the process to date, reports on the findings of relevant baseline studies and outlines the requirements for the remainder of the environmental process. Enviroworks is of the opinion that the information contained in this Final Scoping Report and the documentation attached hereto is sufficient to allow the general public and key stakeholders (including the competent authority) to apply their minds to the potential negative and/or positive impacts associated with the development, in respect of the activities applied for.

The outcome of this Scoping Report has not identified any fatal flaws associated with the development of the proposed Khauta North SPV Facility. Subject to the outcome of the public participation process, it is Enviroworks' reasoned opinion that the project should proceed to the Environmental Impact Assessment phase of the environmental process.

14 LIST OF REFERENCES

- A Practical Field Procedure for the Identification and Delineation of Wetlands and Riparian Areas (DWAF, 2005).
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15 ANNEXURES

APPENDIX A: MAPS

- Annexure A1: Locality Maps

APPENDIX B: DFFE SCREENING TOOL REPORT

APPENDIX C: TERMS OF REFERENCE OF FOR SPECIALISTS

APPENDIX D: CURRICULUM VITAE OF EAP

APPENDIX E: PUBLIC PARTICIPATION DOCUMENT CONTAINING ISSUES, COMMENTS AND RESPONSES

APPENDIX F: OTHER INFORMATION



APPENDIX A:

MAPS

- Annexure A1: Locality Map

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APPENDIX B:

DFFE SCREENING TOOL REPORT

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APPENDIX C:

TERMS OF REFERENCE FOR SPECIALISTS

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