

# ABO WIND

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**ENVIRONMENTAL SCOPING REPORT: THE PROPOSED DEVELOPMENT OF ABO NDAU SOLAR ENERGY FACILITY 1, LOCATED WITHIN THE POLOKWANE LOCAL MUNICIPALITY AND CAPRICORN DISTRICT MUNICIPALITY IN THE LIMPOPO PROVINCE**

**Draft Report**

**Report Date: 08 September 2023**

**Praxos 373 Reference: 220707A**

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## REVISION HISTORY AND APPROVAL

Date	Rev.	Author	Reviewer	Approver
2023.09.08	00	Mr. Richard Myburgh 	Mr. Nishkar Maharaj 	Mr. Manie Cilliers 

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Assistant Environmental Assessment Practitioner	Carmen Krishandutt	Praxos 373 (Pty) Ltd
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Avifauna Impact Assessment	Robyn Phillips	Cossypha Ecological
Battery Energy Storage System (BESS) Risk Assessment	Debra Mitchell	iSHEcon

<b>Role</b>	<b>Name</b>	<b>Company / Organisation</b>
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<b>Palaeontological Desktop Assessment</b>	Jacobus Francois Durand	EnviroSaint (Pty) Ltd
<b>Socio-Economic Impact Assessment</b>	Louis Calitz	Urban Econ
<b>Transport Impact Assessment</b>	Iris Wink	iWink Consulting
<b>Visual Impact Assessment (including Glint &amp; Glare)</b>	Jon Marshall	Environmental Planning and Design

**PURPOSE OF THE DOCUMENT**

The Scoping phase is the first of two phases associated with an application process for Environmental Authorisation (EA), as prescribed by the National Environmental Management Act, 1998 (Act 107 of 1998) [NEMA]. The purpose of this Draft Scoping Report (DSR) is to provide stakeholders with an overview of the Proposed Development and the applicable Listed Activities for which an EA is sought, and the processes undertaken in compliance with the applicable legislative requirements.

In terms of the NEMA, a Scoping Report must comply with the provisions of Section 24N of the Act; and must include all the information specified in Regulation 21 and Appendix 2 of the EIA Regulations, 2014 as amended (EIA Regulations) promulgated under the NEMA and published as Government Notice Regulation (GNR) 982 as amended. The content of the Scoping Report prepared in terms of the Regulations is outlined in **Table 1** below. The relevant sections of the Scoping Report in which the requirements are addressed, is also outlined.

**Table 1: Alignment to Appendix 2 of GNR 982 of the EIA Regulations**

<b>Prescribed content of Scoping Report</b>		<b>Location in Report</b>
<b>a)</b>	<b>Details of –</b>	
(i)	The EAP who prepared the Report.	Section 1.3.4 – 1.3.5
(ii)	The expertise of the EAP, including a curriculum vitae.	Section 1.3.4 – 1.3.5; Appendix A
<b>b)</b>	<b>The location of the activity, including –</b>	
(i)	The 21-digit Surveyor General code of each cadastral land parcel.	Section 2.2
(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.	
<b>c)</b>	<b>A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is –</b>	
(i)	a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	Figure 2
(ii)	on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	
<b>d)</b>	<b>A description of the scope of the proposed activity, including -</b>	
(i)	All listed and specified activities triggered.	Section 2.4
(ii)	A description of the activities to be undertaken, including associated structures and infrastructure.	Section 2
<b>e)</b>	<b>A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.</b>	Section 4
<b>f)</b>	<b>A motivation for the need and desirability for the proposed development including the need and desirability for the activity in the context of the preferred location.</b>	Section 5
<b>g)</b>	<b>A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including –</b>	
(i)	Details of all alternatives considered.	Section 3

<b>Prescribed content of Scoping Report</b>		<b>Location in Report</b>
(ii)	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs.	Section 8; Appendix C
(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.	To be included in the Final Scoping Report (FSR).
(iv)	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	Section 6
(v)	The impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts – (aa) Can be reversed; (bb) May cause irreplaceable loss of resources; and (cc) Can be avoided, managed or mitigated.	Section 7  Will be investigated in more detail during the Environmental Impact Reporting (EIR) phase.
(vi)	The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives.	Section 9.2
(vii)	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	Section 7
(viii)	The possible mitigation measures that could be applied and level of residual risk.	Section 7
(ix)	The outcome of the site selection matrix.	Section 3
(x)	If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such.	Section 3
(xi)	A concluding statement indicating the preferred alternatives, including preferred location of the activity.	Section 3; Section 10
<b>(h)</b>	<b>A plan of study for undertaking the environmental impact assessment process to be undertaken, including –</b>	
(i)	A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.	Section 9.3
(ii)	A description of the aspects to be assessed as part of the environmental impact assessment process.	Section 8
(iii)	Aspects to be assessed by specialists.	Section 9.4
(iv)	A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists.	Section 9.2 - 9.4
(v)	A description of the proposed method of assessing duration and significance.	Section 9.2 - 9.4
(vi)	An indication of the stages at which the competent authority will be consulted.	Section 9.8
(vii)	Particulars of the public participation process that will be conducted during the environmental impact assessment process.	Section 9.7

<b>Prescribed content of Scoping Report</b>		<b>Location in Report</b>
(viii)	A description of the tasks that will be undertaken as part of the environmental impact assessment process.	Section 9.1
(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.	Section 9
<b>(i)</b>	<b>An undertaking under oath or affirmation by the EAP in relation to –</b>	
(i)	The correctness of the information provided in the report.	Section 11; Appendix A
(ii)	The inclusion of comments and inputs from stakeholders and interested and affected parties.	Section 11; Appendix A
(iii)	Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	Section 11; Appendix A
<b>(j)</b>	<b>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.</b>	Section 11; Appendix A
<b>(k)</b>	<b>Where applicable, any specific information required by the competent authority.</b>	N/A
<b>(l)</b>	<b>Any other matter required in terms of section 24(4)(a) and (b) of the Act.</b>	N/A
(2)	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a scoping report, the requirements as indicated in such notice will apply.	N/A

The DSR identifies the potential biophysical, social and health aspects and impacts of the Proposed Development on the receiving environment and provides the opportunity for comments to be received from stakeholders in the identification of key issues and areas of concern, to inform the Environmental Impact Assessment (EIA) process. The main objectives of the Scoping phase are as follows:

- Provide a description of the Proposed Development, including the project motivation.
- Identify feasible alternatives to the Proposed Development to be assessed in the EIR Phase.
- Describe the status quo of the biophysical and socio-economic characteristics of the affected environment where the development will occur.
- Define the legal, policy and planning context for the Proposed Development.
- Identify and describe the anticipated environmental, social and cultural impacts, including cumulative impacts, associated with the Proposed Development and outline Specialist Studies, included within the Scoping and Environmental Impact Reporting (S&EIR) process to assess these issues in further detail.
- Identify the key issues to be addressed during the impact assessment phase.
- Undertake a Public Participation Process (PPP) which provides all stakeholders and Interested and Affected Parties (I&APs) with opportunities to be involved, and to provide their views and concerns.
- Describe the methodology applied to conduct the Scoping phase.
- Describe the Plan of Study (PoS) for the Environmental Impact Reporting (EIR) phase (second phase of the S&EIR process), which describes the nature and extent of further investigations required in the EIR phase.

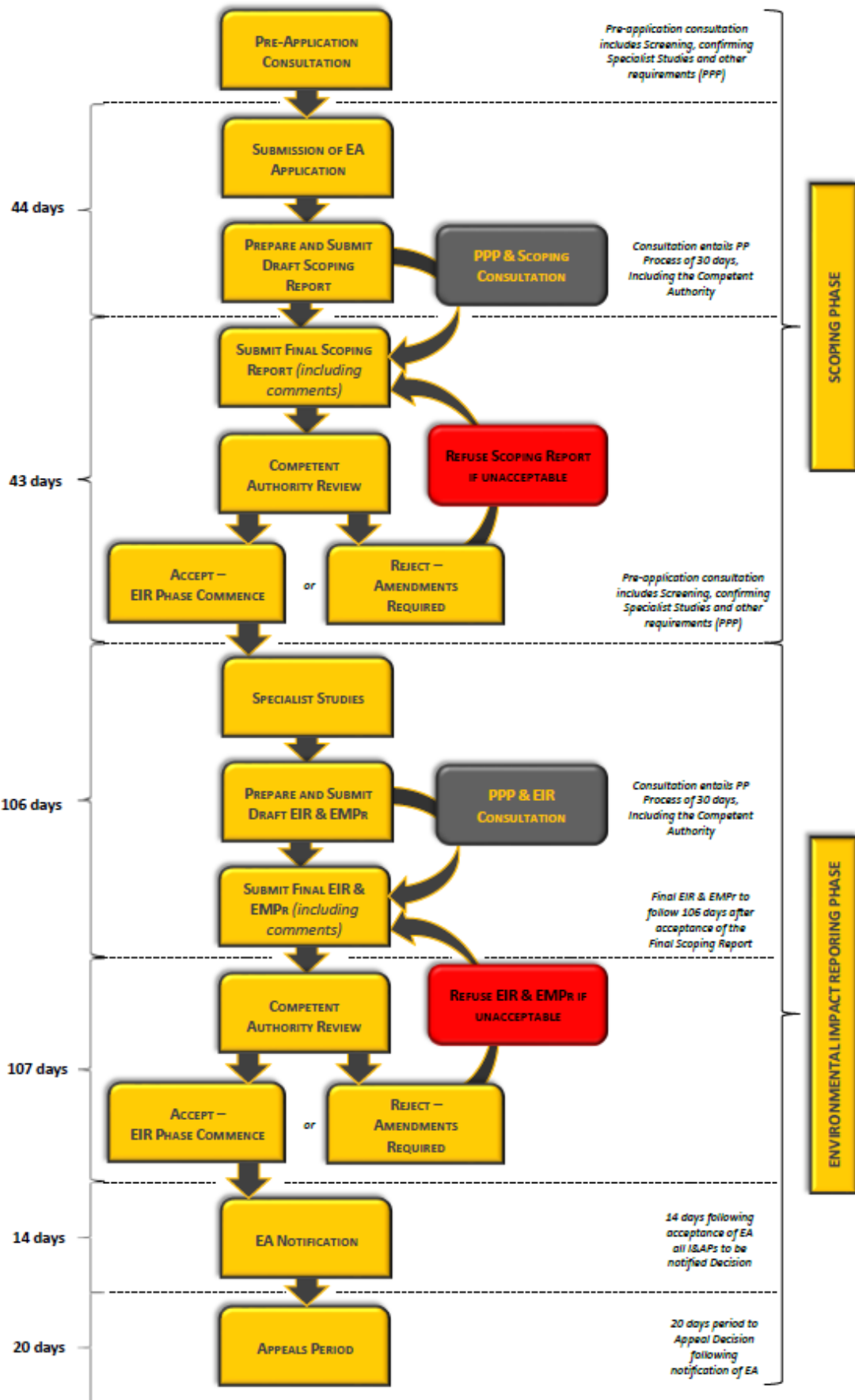
A period of 30 calendar days will be provided for public review and comment on the DSR. All I&APs, key stakeholders as well as State Departments will be notified of this review period.

The DSR contains the following information:

- A description of the project, including project motivation.
- Discussion of applicable alternatives.
- A description of the environment affected by the project.
- The PPP undertaken thus far/planned.
- The PoS for the EIR phase.

Following the commenting period, the Scoping Report will be updated and prepared for submission to the Competent Authority (CA) for consideration. All comments received on the report during the public review period of the DSR will be incorporated and responded to in a Comments & Responses Report that will be attached as a separate Appendix. If the Scoping Report is accepted, the EIR phase will be initiated.

The flow diagram in **Figure 1** below highlights the phases in the environmental application and assessment process, as well as where I&APs have the opportunity to participate in the process.



**Figure 1: Flow Diagram of the Environmental Application Process & Public Participation Stages of the S&EIR Process**



## EXECUTIVE SUMMARY

### Introduction

Praxos 373 (Pty) Ltd (*Praxos*) was appointed as an Environmental Assessment Practitioner (*EAP*) by ABO Wind Renewable Energies (Pty) Ltd (*ABO Wind*) on behalf of ABO Ndau Solar Energy Facility 1 (Pty) Ltd (*Applicant*), to undertake the S&EIR process for the Ndau Solar Energy Facility 1 (*Proposed Development*), located within the Polokwane Local Municipality (*PLM*) and Capricorn District Municipality (*CDM*), in the Limpopo Province, South Africa.

### Project Description

Table 2 below provides a brief overview of the project information.

**Table 2: General Project Information**

Project Information													
<b>Project Name</b>	ABO Ndau Solar Energy Facility 1.												
<b>Province</b>	Limpopo.												
<b>District Municipality</b>	Capricorn District Municipality.												
<b>Local Municipality</b>	Polokwane Local Municipality.												
<b>Farm Numbers with Portions</b>	Portion 19 of the Farm Rietvley No. 13. Remaining Extent of the Farm Rietvley No. 13 (access road only).												
<b>Development Footprint (ha)</b>	<table border="1"> <thead> <tr> <th>Proposed Infrastructure</th> <th>Size</th> </tr> </thead> <tbody> <tr> <td>Solar field arrays and internal roads</td> <td>128 ha</td> </tr> <tr> <td>Access road*</td> <td>2.45 ha</td> </tr> <tr> <td>On-site sub-station hub</td> <td>5 ha</td> </tr> <tr> <td>Perimeter fencing</td> <td>0.5 ha (assuming <math>\pm</math> 1 m trenching/disturbance)</td> </tr> <tr> <td><b>Total Maximum Development Footprint</b></td> <td><b>136 ha</b></td> </tr> </tbody> </table>	Proposed Infrastructure	Size	Solar field arrays and internal roads	128 ha	Access road*	2.45 ha	On-site sub-station hub	5 ha	Perimeter fencing	0.5 ha (assuming $\pm$ 1 m trenching/disturbance)	<b>Total Maximum Development Footprint</b>	<b>136 ha</b>
	Proposed Infrastructure	Size											
	Solar field arrays and internal roads	128 ha											
	Access road*	2.45 ha											
	On-site sub-station hub	5 ha											
	Perimeter fencing	0.5 ha (assuming $\pm$ 1 m trenching/disturbance)											
<b>Total Maximum Development Footprint</b>	<b>136 ha</b>												
<i>*Noting that, existing roadway would mostly be used and widened, so the extent of disturbance would be less.</i>													
<b>Catchment Area</b>	Limpopo Water Management Area.												
<b>Vegetation Type(s)</b>	Polokwane Plateau Bushveld.												
<b>Specialist Studies to be undertaken</b>	<ul style="list-style-type: none"> <li>• Agricultural Assessment.</li> <li>• Aquatic Biodiversity &amp; Wetland Delineation Assessment.</li> <li>• Archaeological &amp; Cultural Heritage Impact Assessment.</li> <li>• Avifauna Impact Assessment.</li> <li>• BESS Risk Assessment.</li> <li>• Ecological Impact Assessment (Fauna &amp; Flora).</li> <li>• Geotechnical Assessment.</li> <li>• Geohydrological Impact Assessment.</li> <li>• Palaeontological Desktop Assessment</li> <li>• Socio-Economic Impact Assessment.</li> <li>• Transport Impact Assessment.</li> <li>• Visual Impact Assessment (including Glint &amp; Glare).</li> </ul>												
Design Specifications													
<b>Facility Capacity</b>	120 Megawatts (MW).												

Project Information	
<b>Battery Technology</b>	Lithium-ion (Preferred). Redox flow (Alternative).

### Identified Listed Activities

The listed activities which are being applied for are provided below:

#### Listed Activities as set out in Listing Notice 1 (GNR 983)

- No. 11 (i) The development of facilities or infrastructure for the transmission and distribution of electricity—  
(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.

Description: The Proposed Development will include a substation/collector infrastructure with a capacity of 132 kV. The Proposed Development will include underground cables for internal electrical reticulation, however the capacity of these lines will not exceed 33 kV and is expected to be within the range of 22 – 33 kV. The Proposed Development is located outside an urban area and industrial complex.

- No. 12 (ii) (b) The development of—  
(ii) infrastructure or structures with a physical footprint of 100 square metres or more;  
Where such development occurs –  
(b) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.

Description: The layout of the Proposed Development has been designed to avoid sensitive aquatic environments on the affected property. A portion of the Proposed Development and associated infrastructure (exceeding 100 sqm) would however be located within 32 m of seasonal streams/drainage lines located adjacent to the facility. There would also be some infilling of dams on site which have been mapped as artificial wetlands of low sensitivity to allow for development.

- No. 19 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.

Description: The infilling of artificial wetlands to allow for development on site will exceed the 10 cubic metres threshold stipulated by this Listed Activity.

- No. 24 (ii) The development of a road—  
(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.

Description: An access road will be constructed to access the Proposed Development. This access road will follow existing farm roads as far as possible. The maximum access road width will be 10 m. Internal roads would be 8 m in width (maximum).

- No. 28 (ii) Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:  
(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.

Description: The Proposed Development is defined as an industrial development which would occur outside an urban area. The Proposed Development will extend across an area of 136 ha which exceeds the 1 ha threshold. The proposed development is outside an urban area and the current land use within the development footprint is for agriculture.

No. 56 (ii) The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre—

(ii) where no reserve exists, where the existing road is wider than 8 metres.

Description: Where possible existing farm roads on site will be used and upgraded if required. The access road will be widened to a maximum width of 10 m. Where possible, existing farm roads would also be used and lengthened as part of the internal road network, and lengthening would exceed 1 km. The proposed development would occur outside an urban area.

**Listed Activities as set out in Listing Notice 2 (GNR 984)**

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.

Description: The Proposed Development will entail the construction of a new 120 MW photovoltaic solar facility which exceeds the 20 MW threshold stipulated by this Listed Activity. The Project Area is located outside an urban area no existing infrastructure is present.

No. 15 (i) The clearance of an area of 20 hectares or more of indigenous vegetation excluding where such clearance of indigenous vegetation is required for—

(i) the undertaking of a linear activity.

Description: The cumulative vegetation clearance of 133 ha to allow for the development of non-linear infrastructure (i.e., the on-site sub-station hub and foundations for the solar PV arrays) will exceed 20 hectares.

**Listed Activities as set out in Listing Notice 3 (GNR 985)**

No. 3 (e) (i) (gg) The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) is to be placed on a site not previously used for this purpose; and (b) will exceed 15 metres in height – but excluding attachments to existing buildings and masts on rooftops.

e. Limpopo

i. Outside urban areas:

(gg) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas.

Description: A communications tower with a maximum height of 32m is proposed as part of the on-site substation hub and will be located on a site that was not previously used for this purpose. The Proposed Development is located outside an urban area and within 2 km from the Percy Fyfe Nature Reserve which is a designated protected area in terms of NEMPAA.

No. 4 (e) (i) (gg) The development of a road wider than 4 metres with a reserve less than 13.5 metres.

e. Limpopo

i. Outside urban areas:

(gg) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas.

Description: Roads developed for the Proposed Development will be a maximum of 10 m wide. Existing farm roads would be used as far as possible and upgraded. Road development would occur within 2 km from the Percy Fyfe Nature Reserve which is designated protected areas in terms of NEMPAA. The Project Area is located outside urban areas.

No. 14(ii) (c) (e) (i) (hh) The development of -

- (ii) infrastructure or structures with a physical footprint of 10 square metres or more; Where such development occurs—
- (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.
- e. Limpopo
  - i. Outside urban areas:
    - (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve.

**Description:** A portion of the Proposed Development and associated infrastructure (exceeding 10 sqm) would be located within 32 m of seasonal streams/drainage lines located adjacent to the facility. There would also be some infilling of dams on site which have been mapped as artificial wetlands of low sensitivity to allow for development. Development within/close to watercourses would occur within approximately 2 km from the Percy Fyfe Nature Reserve which is a designated protected area in terms of NEMPAA. The Project Area is located outside urban areas.

- No. 18 (e) (i) (gg) The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 Kilometre.
- e. Limpopo
    - i. Outside urban areas:
      - (gg) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas.

**Description:** Where possible existing roads on site will be used and upgraded if required. The access road will be widened to a maximum width of 10 m. Where possible, existing farm roads would also be used and lengthened as part of the internal road network, and lengthening would exceed 1 km. Road construction would occur within 2 km from the Percy Fyfe Nature Reserve which is designated protected areas in terms of NEMPAA. The Project Area is located outside urban areas.

### Environmental Sensitivities and Screening

The below table serves as a summary of the specialist studies required by the DFFE Screening Tool including the sensitivity rating prescribed by the Screening Tool (very high, high, medium, low), and an indication of the sensitivity of the site after the EAP/Specialist conducted the Site Sensitivity Verification Assessment confirming/disputing the sensitivity of themes as identified by screening tool.

**Table 3: Summary of Preliminary Impacts Identified in Relation to the Proposed Development**

<b>Specialist Study identified by Screening Report</b>	<b>Sensitivity as per Screening Report</b>	<b>Site Sensitivity following Verification</b>
<b>Agriculture Theme</b>	Medium	Medium
<b>Animal Species Theme</b>	Medium	Medium
<b>Aquatic Biodiversity Theme</b>	Very High	High
<b>Archaeological and Cultural Heritage Theme</b>	Low	Medium
<b>Avian Theme</b>	Very High	Low to Medium
<b>Battery Energy Storage System (BESS) Risk Assessment</b>	No sensitivity theme identified	Medium/ High

<b>Specialist Study identified by Screening Report</b>	<b>Sensitivity as per Screening Report</b>	<b>Site Sensitivity following Verification</b>
Civil Aviation (Solar PV) Theme	Medium	Low
Defence Theme	Low	Low
Geotechnical Theme	No sensitivity theme identified	To be confirmed during EIR phase
Geohydrological Theme	No sensitivity theme identified	Medium
Landscape (Solar) Theme	Very High	Low to Medium
Palaeontology Theme	Medium	Low
Plant Species Theme	Medium	Medium
Radio Frequency Interference Theme	Medium	Low
Socio-Economic Theme	No sensitivity theme identified	To be confirmed during EIR phase
Terrestrial Biodiversity Theme	Very High	Medium
Traffic & Transport Theme	No sensitivity theme identified	Medium

### Key Environmental Issues Identified through Scoping

**Table 4** below summarises the potential impacts associated with the Proposed Development as identified by the project team during the Scoping Phase including all alternatives. All impacts identified will be further investigated during the EIR phase and mitigation measures for significant impacts will be stipulated in the EIR and included in the Environmental Management Programme (*EMPr*).

**Table 4: Summary of Preliminary Impacts Identified in Relation to the Proposed Development**

<b>Environmental Aspect</b>	<b>Potential Impact</b>	<b>Proposed Method of Investigation</b>
<b>Biodiversity (Fauna and Flora)</b>	<ul style="list-style-type: none"> <li>Flora and faunal habitat loss and fragmentation due to the Proposed Development requiring large areas of land. Specifically, loss of the natural bushveld vegetation and plant SCC in an ESA.</li> <li>Impacts on ESA and broadscale ecological processes.</li> <li>Soil erosion, compaction, and disturbance to vegetation, particularly if heavy machinery is used.</li> <li>Proliferation of alien plant invasion through soil disturbance.</li> <li>Impacts on wildlife, particularly in sensitive habitats and/ or breeding areas such as noise, and vibration.</li> <li>Shading of areas from placement of solar panels which may affect the growth of vegetation underneath.</li> </ul>	A detailed Terrestrial Ecological Impact Assessment which includes faunal and floral components will be undertaken by a qualified Specialist during the EIR phase to investigate the identified preliminary impacts and define specific mitigation measures.

Environmental Aspect	Potential Impact	Proposed Method of Investigation
	<ul style="list-style-type: none"> <li>• Injury and/ or death to fauna due to collisions and/ or vegetation clearance and excavations.</li> <li>• Highly reflective panels creating glare, thereby visually distracting or causing harm to nearby wildlife.</li> <li>• General increase in anthropogenic impacts due to an increase in people into the area.</li> </ul>	
<p><b>Biodiversity (Avifauna)</b></p>	<ul style="list-style-type: none"> <li>• Loss of vegetation and avifaunal habitat through the clearing of vegetation for installation of solar panels, roads, and buildings that will have an effect on the natural bushveld, terrestrial savanna species, large-bodied, ground-dwelling gamebirds, and raptors.</li> <li>• Disturbance and displacement of resident bird species.</li> <li>• Permanent habitat destruction and fragmentation.</li> <li>• Infrastructure may create barriers to bird movement and disrupt migration patterns.</li> <li>• Collision of avifauna with reflective surfaces of solar panels leading to injury or death as birds perceive large panel arrays for waterbodies, otherwise known as the “lake effect”.</li> <li>• Noise during construction and utilising associated infrastructural equipment during operation.</li> <li>• Attraction of novel species through the creation of artificial nest sites and shade.</li> <li>• Contamination of the environment through the use of hazardous materials from cleaning of panels.</li> </ul>	<p>A detailed Avifaunal Impact Assessment will be undertaken during the EIR phase by a qualified Specialist which will include sampling conducted over two seasons (phase 1 and 2) with one undertaken during the peak (summer) season. This will also provide a baseline against which post-construction monitoring can be compared.</p>
<p><b>Aquatic</b></p>	<ul style="list-style-type: none"> <li>• Disturbance and possible loss of aquatic habitat within the watercourses with an increased risk of the already highly eroded streams.</li> <li>• The removal of indigenous aquatic vegetation that has the potential to result in further alien vegetation infestation within the aquatic features.</li> <li>• Demand for water for construction could place stress on the existing available water resources since the area is a strategic water source area of groundwater.</li> <li>• Inadequately designed facilities and roads could increase the erosion potential at the Project Area.</li> <li>• Increased sedimentation due to erosion and risks of contamination of surface water runoff</li> </ul>	<p>A detailed Aquatic Impact Assessment which will include wetland delineation will be undertaken during the EIR phase by a qualified Specialist.</p>

Environmental Aspect	Potential Impact	Proposed Method of Investigation
	<p>due to usage/ presence of hazardous substances.</p> <ul style="list-style-type: none"> <li>Alteration of surface water run-off from development activities that have the potential to result in erosion or sedimentation of the watercourses.</li> <li>Damage or loss of riparian and wetlands systems.</li> <li>Ongoing disturbance of aquatic features and associated vegetation due to maintenance activities.</li> <li>Possible increase in water consumption and potential for water quality impacts such as contamination from sewage generated on-site.</li> </ul>	
Groundwater	<ul style="list-style-type: none"> <li>Accidental spillage or leaks of hazardous substances contained in solar PV panels such as cadmium, lead, and mercury during installation or maintenance, or spillage of hydrocarbons utilised on site during construction that may lead to contamination of productive aquifers and subsequently pose a threat to human health.</li> <li>Excavation and soil disturbance during construction could affect groundwater quality by increasing the risk of pollutants such as sediment, nutrients, and salts leaching into the water table.</li> <li>Alteration of the hydrological regime and reduction in groundwater recharge impacting on the sustainability of groundwater resources.</li> </ul>	<p>A detailed Geohydrological Impact Assessment will be undertaken during the EIR phase by a qualified Specialist to investigate the identified preliminary impacts and define specific mitigation measures.</p>
Visual	<ul style="list-style-type: none"> <li>Landscape change – <ul style="list-style-type: none"> <li>General degradation of the local landscape;</li> <li>Increase in industry and loss of natural landscape.</li> </ul> </li> <li>Visual Impact from the Main Roads – <ul style="list-style-type: none"> <li>Degradation of views from the N1 in proximity to the proposed site;</li> <li>Loss of views of natural landscape.</li> </ul> </li> <li>Visual Impacts on Local Roads – <ul style="list-style-type: none"> <li>Degradation of the local landscape as viewed from adjacent local roads;</li> <li>Industrialisation of views from local roads.</li> </ul> </li> <li>Impacts on Homesteads – <ul style="list-style-type: none"> <li>Degradation of the local landscape as viewed from homesteads.</li> </ul> </li> <li>Protected Areas –</li> </ul>	<p>A detailed Landscape and Visual Impact Assessment which will include an assessment of glint and glare issues will be undertaken during the EIR phase by a qualified Specialist.</p>



Environmental Aspect	Potential Impact	Proposed Method of Investigation
	<ul style="list-style-type: none"> <li>○ Degradation of views from the Percy Fyfe Nature Reserve;</li> <li>○ Possible reflection from solar panels.</li> </ul>	
<b>Noise</b>	<ul style="list-style-type: none"> <li>● Installation of the facility involves heavy machinery and construction vehicles thus generating high levels of noise and subsequently disrupting nearby communities and/ or wildlife habitats.</li> <li>● Inverters and transformers producing low-frequency noise can potentially affect the quality of life of nearby residents and wildlife.</li> </ul>	<p>No significant noise impacts are envisaged. As such, no Specialist Study will be undertaken. A general assessment of impacts based on available information through other studies conducted in the area will be undertaken by the EAP.</p>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>● Generation of dust, particulate matter, and other air pollutants resulting from excavation, earthworks, and transportation of materials and equipment to and from the Project Area.</li> <li>● Emissions generated from the operation of the facilities through the use of backup generators, inverters, and other equipment.</li> <li>● Conversion of agricultural land into industrial use leading to reduced air quality by altering the natural balance of ecosystems and increasing the risk of soil erosion.</li> </ul>	<p>No significant impacts are anticipated with regards to air emissions from the Proposed Development. As such, no Specialist Study will be undertaken. A general assessment of impacts based on available information through other studies conducted in the area will be undertaken by the EAP.</p>
<b>Traffic</b>	<p>Preliminary impacts as identified by the EAP have been listed below:</p> <ul style="list-style-type: none"> <li>● Increased traffic volume on local roads and highways due to the transportation of materials and equipment to the site leading to congestion and delays for commuters and residents in the area.</li> <li>● Increased presence of construction vehicles and heavy equipment on local roads and highways can pose safety concerns for motorists, pedestrians, and cyclists. The movement of oversized loads and construction equipment may require temporary road closures or traffic diversions.</li> <li>● Damage to local roads and highways due to transportation of heavy equipment.</li> </ul>	<p>A detailed Transport Impact Assessment will be undertaken during the EIR phase by a qualified Specialist to investigate the identified preliminary impacts and will provide more details regarding the capacity of the existing road network to accommodate increased traffic.</p>
<b>Cultural and Heritage</b>	<ul style="list-style-type: none"> <li>● Disturbance or destruction of cultural heritage sites, such as archaeological sites or traditional cultural landscapes resulting in the loss of cultural heritage and historical information.</li> </ul>	<p>A Phase 1 Heritage Impact Assessment will be undertaken during the EIR phase by a suitable Specialist to investigate the</p>



Environmental Aspect	Potential Impact	Proposed Method of Investigation
	<ul style="list-style-type: none"> <li>• Potential impact on paleontological resources such as fossil sites or important geological formations.</li> <li>• Impact the landscape and scenic values of the area affecting the aesthetic and cultural values of an area, including the enjoyment of the natural environment by local communities and tourists.</li> </ul>	<p>identified preliminary impacts and to define specific mitigation measures.</p> <p>The palaeontological sensitivity map available from the SAHRIS database indicates the site to lay within grey (zero) and blue (low) sensitivity. The Palaeontologist has confirmed that no further assessment will be required for the surveyed footprints.</p>
<b>Waste Generation</b>	<ul style="list-style-type: none"> <li>• Inadequate handling and disposal of waste (general and hazardous) such as contaminated soil, oil cans, oily rags concrete, and packaging materials generated during construction may affect local biodiversity.</li> <li>• At the end of life, solar PV panels and BESS will need to be disposed of or recycled, which can potentially generate waste and require appropriate management.</li> </ul>	<p>Investigation of waste impacts will involve a general assessment based on available information provided in various Specialist Studies as well as through the knowledge of the EAP. Requirements will be aligned to the relevant legislation.</p>
<b>Socio-economic</b>	<ul style="list-style-type: none"> <li>• Temporary stimulation of the provincial economy and growth in the regional Gross Value Added</li> <li>• Job creation in areas such as engineering, installation, maintenance, and management, which can contribute to local economic development.</li> <li>• The Proposed Development can bring economic benefits to the local community, such as increased tax revenue and business opportunities for local suppliers and contractors.</li> <li>• Negative temporary change to the sense of place during construction. This can be attributed to the increased presence of people and the general construction activities taking place.</li> <li>• Temporary increase in crime and social conflicts associated with influx (or removal) of people.</li> </ul>	<p>A detailed Socio-Economic Impact Assessment will be undertaken during the EIR phase by a qualified Specialist to investigate the identified preliminary impacts and to define specific mitigation measures.</p>

Environmental Aspect	Potential Impact	Proposed Method of Investigation
	<ul style="list-style-type: none"> <li>• Potential impact on the environment during construction. The construction phase poses potential risks of contamination, including water, dust, and air pollution. These contaminants can have adverse effects on the surrounding environment, potentially affecting water sources, air quality, and overall ecosystem health.</li> <li>• Disruption to communities through noise, traffic, and visual impacts, which can affect quality of life.</li> </ul>	

### Conclusion

The DSR will be made available for public review and comment for a period of 30 calendar days (**Wednesday, 13 September to Monday, 16 October 2023**). Questions and concerns raised by I&APs and key stakeholders during the PPP will be captured in the Comments and Response Report (*CRR*), which will be included in the Final Scoping Report (*FSR*).

The EIR phase may only commence once the CA accepts the FSR and instructs the EAP to continue with the tasks contemplated in the PoS for the EIR phase. Praxos as the EAP and the project team commits to the following:

- To facilitate a fair and transparent process going forward.
- To capture and consider all comments received from stakeholders and I&APs.
- To remain independent of the Applicant.
- To present the CA with the necessary information to reach a decision.
- To fulfil any and all other obligations placed on the EAP, in terms of the NEMA.

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## ACRONYMS

<b>ACHASM</b>	Association of Construction Health and Safety Management
<b>AEL</b>	Atmospheric Emissions Licence
<b>BBBEE</b>	Broad-Based Black Economic Empowerment
<b>BESS</b>	Battery Energy Storage System
<b>BGL</b>	Below Ground Level
<b>C</b>	Contractor
<b>CA</b>	Competent Authority
<b>CARA</b>	Conservation of Agricultural Resources Act
<b>CBA</b>	Critical Biodiversity Area
<b>CDM</b>	Capricorn District Municipality
<b>CE</b>	Consulting Engineer
<b>CMAs</b>	Catchment Management Agencies
<b>COP</b>	Conference of Parties
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>CRR</b>	Comments and Responses Report
<b>CSIR</b>	Council for Scientific and Industrial Research
<b>CSP</b>	Concentrating Solar-Thermal Power
<b>CV</b>	Curriculum Vitae
<b>DEIR</b>	Draft Environmental Impact Report
<b>DFFE</b>	Department of Forestry, Fisheries and the Environment
<b>DMRE</b>	Department of Mineral Resources and Energy
<b>DoE</b>	Department of Energy
<b>DSR</b>	Draft Scoping Report
<b>DWS</b>	Department of Water and Sanitation
<b>EA</b>	Environmental Authorisation
<b>EAF</b>	Energy Availability Factor
<b>EAP</b>	Environmental Assessment Practitioner
<b>EAPASA</b>	Environmental Assessment Practitioners Association of South Africa
<b>EC</b>	Electrical Conductivity
<b>ECO</b>	Environmental Control Officer
<b>EGI</b>	Electricity Grid Infrastructure
<b>EIA</b>	Environmental Impact Assessment
<b>EIR</b>	Environmental Impact Report
<b>EMPr</b>	Environmental Management Programme
<b>EO</b>	Environmental Officer
<b>ESA</b>	Ecological Support Area
<b>FEIR</b>	Final Environmental Impact Report
<b>FEPA</b>	Freshwater Ecosystem Priority Area
<b>FSR</b>	Final Scoping Report
<b>GDP</b>	Gross Domestic Product
<b>GHG</b>	Greenhouse Gas
<b>GHI</b>	Global Horizontal Irradiation
<b>GHS</b>	Globally Harmonized Systems
<b>GIS</b>	Geographic Information System
<b>GW</b>	Gigawatt
<b>GWh</b>	Gigawatt-hour

<b>GNR</b>	Government Notice Regulation
<b>GVA</b>	Gross Value Add
<b>Ha</b>	Hectare
<b>HAS</b>	Hazardous Substances Act
<b>HCS</b>	Hazardous Chemical Substances
<b>HIA</b>	Heritage Impact Assessment
<b>HSE</b>	Health, Safety and Environment
<b>I&amp;AP</b>	Interested and Affected Party
<b>IBA</b>	Important Bird Area
<b>IDP</b>	Integrated Development Plan
<b>IEM</b>	Integrated Environmental Management
<b>IEP</b>	Integrated Energy Plan
<b>ILO</b>	International Labour Organisation
<b>INDC</b>	Intended Nationally Determined Contribution
<b>IPAP2</b>	Industrial Policy Action Plan
<b>IPP</b>	Independent Power Producer
<b>IRP</b>	Integrated Resource Plan
<b>Km</b>	Kilometres
<b>KV</b>	kilovolt
<b>kWh/m<sup>2</sup></b>	Kilowatt hours per square meter
<b>ℓ/s</b>	Litres per second
<b>LCA</b>	Landscape Character Area
<b>LCC</b>	Land Capability Class
<b>LCP</b>	Limpopo Conservation Plan
<b>LDP</b>	Limpopo Development Plan
<b>LEDET</b>	Limpopo Economic Development, Environment and Tourism
<b>LEGDP</b>	Limpopo Employment Growth and Development Plan
<b>LEIP</b>	Limpopo Environmental Implementation Plan
<b>LEMA</b>	Limpopo Environmental Management Act
<b>LGDS</b>	Limpopo Growth and Development Strategy
<b>LIHRA</b>	Limpopo Provincial Heritage Resources Authority
<b>LSDF</b>	Limpopo Provincial Spatial Development Framework
<b>LSU</b>	Large Stock Unit
<b>m</b>	Metres
<b>MDGs</b>	Millennium Development Goals
<b>Mg/m<sup>2</sup>/day</b>	Milligrams per square metre per day
<b>Mg/ m<sup>3</sup></b>	Milligrams per cubic metre
<b>MPRDA</b>	Minerals and Petroleum Development Act
<b>mS/m</b>	Millisiemens per meter
<b>MTSF</b>	Medium-Term Strategic Framework
<b>MW</b>	Megawatt
<b>NCCRP</b>	National Climate Change Response Policy
<b>NCR</b>	Noise Control Regulations
<b>NDCs</b>	Nationally Determined Contributions
<b>NDP</b>	National Development Plan
<b>NEMA</b>	National Environmental Management Act
<b>NEMAQA</b>	National Environmental Management Air Quality Act
<b>NEMBA</b>	National Environmental Management Biodiversity Act



<b>NEMWA</b>	National Environmental Management Waste Act
<b>NEMPAA</b>	National Environmental Management: Protected Areas Act
<b>NERSA</b>	National Energy Regulator Act
<b>NFA</b>	National Forests Act
<b>NFEPA</b>	National Freshwater Ecosystem Priority Area
<b>NGPF</b>	New Growth Path Framework
<b>NHRA</b>	National Heritage Resources Act
<b>NIP</b>	National Infrastructure Plan
<b>NNS</b>	National Norms and Standards
<b>NO</b>	Nitric Oxide
<b>NO<sub>x</sub></b>	Nitrogen Oxides
<b>NO<sub>2</sub></b>	Nitrogen Dioxide
<b>NPAES</b>	National Protected Area Expansion Strategy
<b>NRTA</b>	National Road Traffic Act
<b>NSBA</b>	National Spatial Biodiversity Assessment
<b>NSDF</b>	National Spatial Development Framework
<b>NSPCA</b>	National Council of Societies for the Prevention of Cruelty to Animals
<b>NWA</b>	National Water Act
<b>OHSA</b>	Occupational Health and Safety Act
<b>OHSE</b>	Occupational Health, Safety, and Environment
<b>OCGT</b>	Open Cycle Gas Turbine
<b>P</b>	Proponent
<b>PAIA</b>	Promotion of Access to Information Act
<b>PAJA</b>	Promotion of Administrative Justice Act
<b>PAR</b>	Protected Areas Register
<b>PDA<sub>s</sub></b>	Primary Drainage Areas
<b>PHRA</b>	Provincial Heritage Resources Authority
<b>PICC</b>	Presidential Infrastructure Coordinating Commission
<b>PLM</b>	Polokwane Local Municipality
<b>PM</b>	Project Manager
<b>PM</b>	Particulate Matter
<b>PoS</b>	Plan of Study
<b>PPA</b>	Power Purchase Agreement
<b>PPP</b>	Public Participation Process
<b>PSEDS</b>	Provincial Spatial Economic Development Strategy
<b>PV</b>	Photovoltaic
<b>QDA<sub>s</sub></b>	Quaternary Drainage Areas
<b>QDGC</b>	Quarter Degree Grid Cell
<b>QDS</b>	Quarter Degree Square
<b>RDL</b>	Red Data List
<b>RE</b>	Resident Engineer
<b>REFIT</b>	Renewable Energy Feed-in Tariff
<b>REIPPPP</b>	Renewable Energy Independent Power Producer Procurement Programme
<b>SAAQIS</b>	South African Information System
<b>SACNASP</b>	South African Council for Natural Scientific Professions
<b>SACPCMP</b>	South African Council for the Project and Construction Management Professions
<b>SAHRA</b>	South African Heritage Resources Association
<b>SAHRIS</b>	South African Heritage Resource Information System

<b>SAIOSH</b>	South African Institute of Occupational Safety and Health
<b>SANBI</b>	South African National Biodiversity Institute
<b>SANS</b>	South African National Standards
<b>SCC</b>	Species of Conservation Concern
<b>S&amp;EIR</b>	Scoping and Environmental Impact Report
<b>SDGs</b>	Sustainable Development Goals
<b>SDF</b>	Spatial Development Framework
<b>SEA</b>	Strategic Environmental Assessment
<b>SEMA</b>	Specific Environmental Management Act
<b>SERO</b>	Socio-Economic Review and Outlook
<b>SG</b>	Surveyor General
<b>SOx</b>	Sulphur Oxides
<b>SO<sub>2</sub></b>	Sulphur Dioxide
<b>SPLUMA</b>	Spatial Planning and Land Use Management Act
<b>SSV</b>	Site Sensitivity Verification
<b>StatsSA</b>	Statistics South Africa
<b>SWMP</b>	Storm Water Management Plan
<b>SWSA</b>	Strategic Water Source Area
<b>TOPS</b>	Threatened or Protected Species
<b>ToR</b>	Terms of Reference
<b>TWh</b>	Terawatt-hour
<b>UNDP</b>	United Nations Development Programme
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>VIA</b>	Visual Impact Assessment
<b>WHO</b>	World Health Organisation
<b>WMAs</b>	Water Management Areas
<b>WML</b>	Waste Management Licence
<b>WUA</b>	Water Use Authorisation
<b>WULA</b>	Water Use Licence Application

## GLOSSARY OF TERMS AND DEFINITIONS

<b>Term</b>	<b>Description</b>
<b>Bund / Bunded Area</b>	A bund is an embankment or wall of brick, stone, concrete or other impervious material, which forms the perimeter and floor of a compound and acts as a barrier to retain liquids. Bunds are designed to contain spillages and leaks in order to prevent pollution of the receiving environment. Bunds are also used for fire protection, product recovery and process isolation.
<b>Clearing</b>	Means the clearing and removal of vegetation and topsoil, whether partially or in whole, including trees and shrubs, as specified
<b>Construction Activity</b>	A construction activity is any action taken by the Contractor, his subcontractors, suppliers or personnel during the construction process.
<b>Construction Camp</b>	The area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management
<b>Contractor</b>	That main organisation appointed by the Proponent, through the Project Manager, to undertake construction activities on the site.
<b>Dangerous Goods</b>	Means goods containing any of the substances as contemplated in South African National Standard No. 10234, supplement 2008 1.00: designated “List of classification and labelling of chemicals in accordance with the Globally Harmonized Systems (GHS)” published by Standards South Africa, and where the presence of such goods, regardless of quantity, in a blend or mixture, causes such blend or mixture to have one or more of the characteristics listed in the Hazard Statements in section 4.2.3, namely physical hazards, health hazards or environmental hazards
<b>Draft Scoping Report</b>	The ‘Draft’ Scoping Report (DSR) relates to the report that will undergo public review and is a term applied meant to distinguish between the report that will updated to include the comments received (Final Scoping Report). The DSR is in no way an incomplete report, or missing requisite supporting documentation and information.
<b>Environmental Control Officer</b>	As an independent appointment, the Environmental Control Officer (ECO) monitors compliance with the EMPr during the construction phase and advises the Project Manager on environmental matters relating to construction.
<b>Environmental Management Programme</b>	The Environmental Management Programme (EMPr) for the project sets out general instructions that should be included in a contract document for the construction phase of the project and implemented during the Operational Phase. The EMPr will ensure the activities are conducted and managed in an environmentally sound and responsible manner.
<b>Environment</b>	Means the surroundings within which humans exist and that are made up of: <ul style="list-style-type: none"> <li>a) The land, water and atmosphere of the earth;</li> <li>b) Micro-organisms, plant and animal life;</li> <li>c) Any part or combination of a) and b) and the interrelationships among and between them; and</li> <li>d) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.</li> </ul>

<b>Term</b>	<b>Description</b>
<b>Environmental Method Statement</b>	<p>Also referred to as just “Method Statement”. This is a written submission by the Contractor to the Project Manager in response to this EMP or a request by the Project Manager and ECO. The Method Statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;</p> <p>Method Statements shall cover applicable details with regard to:</p> <ul style="list-style-type: none"> <li>(i) Construction procedures;</li> <li>(ii) Plant, materials and equipment to be used;</li> <li>(iii) Transporting the equipment to and from site;</li> <li>(iv) How the plant/ material/ equipment will be moved while on site;</li> <li>(v) How and where the plant/ material/ equipment will be stored;</li> <li>(vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any <ul style="list-style-type: none"> <li>(vii) liquid or material that may occur;</li> <li>(viii) Timing and location of activities;</li> <li>(ix) Compliance/ non-compliance; and</li> <li>(x) Any other information deemed necessary by the Project Manager.</li> </ul> </li> </ul>
<b>Environmental Specifications</b>	Instructions and guidelines for specific construction activities designed to help prevent, reduce and/or control the potential environmental implications of these construction activities.
<b>Fauna</b>	Refers to all animals, including insects and micro-organisms.
<b>Final Scoping Report</b>	The ‘Final’ Scoping Report (FSR) relates to the report where comments and inputs following public review has been considered and incorporated into the report and submitted to the Competent Authority for decision making.
<b>Flora</b>	Refers to all plant species.
<b>Hazardous Chemical Substances</b>	Relates to substances governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995. Hazardous Chemical Substances are solids, liquids, or gases that can harm people, other living organisms, property, or the environment. They are often subject to chemical regulations.
<b>Hazardous Waste</b>	Hazardous waste is waste that poses substantial or potential threats to public health or the environment due to its composition or chemical properties
<b>Pollution</b>	The introduction into the environment of any substance caused by the action of man which has, or results in, significant harmful effects to mankind or the environment. Pollutants include any substances which make the environment less fit in any way for its intended use.
<b>Project Area</b>	Defined as the area occupied by the Ndau Solar Energy Facility 1 and associated infrastructure on Portion 19 of the Farm Rietvley No. 13 and the Remaining Extent of Farm Rietvley No. 13 (access road only)
<b>Project Manager</b>	The Project Manager (PM) is the appointed firm/person responsible for overall management of the construction phase of the project including the management of all contractors.
<b>Proposed Development</b>	Means the Ndau Solar Energy Facility 1.
<b>Slope</b>	Means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units

<b>Term</b>	<b>Description</b>
<b>Soil</b>	The upper layer of earth in which plants grow a black or dark brown material typically consisting of a mixture of organic remains, clay, and rock particles.
<b>Solid waste</b>	Means all solid waste, including but not limited to construction debris, hazardous waste, excess cement/concrete, wrapping and packaging materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
<b>Spoil</b>	Refers to excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works.
<b>Waste</b>	Means any substance, whether or not that substance can be reduced, reused, recycled and recovered, that <ul style="list-style-type: none"> <li>a) is surplus, unwanted, rejected, discarded, abandoned or disposed of</li> <li>b) the generator has no further use of - for the purposes of production, reprocessing or consumption;</li> <li>c) that must be treated or disposed of; or</li> <li>d) is identified as a waste by the Minister.</li> </ul>
<b>Watercourse</b>	Watercourse means - <ul style="list-style-type: none"> <li>a) a river or spring;</li> <li>b) a natural channel in which water flows regularly or intermittently;</li> <li>c) a wetland, lake or dam into which, or from which, water flows; and</li> <li>d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.</li> </ul>
<b>Works</b>	Means the Works to be executed in terms of the Contract

## 1. INTRODUCTION

Praxos, was appointed as an Environmental Assessment Practitioner (*EAP*) by ABO Wind Renewable Energies (Pty) Ltd (*ABO Wind*) on behalf of ABO Ndaou Solar Energy Facility 1 (Pty) Ltd to undertake the application process for Environmental Authorisation (*EA*), subject to a Scoping and Environmental Impact Reporting (*S&EIR*) process, for the Proposed Development of the ABO Ndaou Solar Energy Facility 1. The Proposed Development will be located within the Polokwane Local Municipality (*PLM*) and Capricorn District Municipality (*CDM*) of Limpopo Province, South Africa.

### 1.1 APPLICATION PROCESS

The Proposed Development is currently in the Scoping phase and is supplemented by this Draft Scoping Report (*DSR*). The purpose of this phase is to determine, in detail, the scope of the Environmental Impact Assessment (*EIA*) required for the Proposed Development. The primary objectives of the Scoping phase in accordance with the EIA Regulations are to:

- Provide a description of the Proposed Development, including the project motivation.
- Identify feasible alternatives to the Proposed Development to be assessed in the EIR phase.
- Describe the status quo of the biophysical and socio-economic characteristics of the affected environment where the development will occur.
- Define the legal, policy and planning context for the Proposed Development.
- Identify and describe the anticipated environmental, social and cultural impacts, including cumulative impacts, associated with the Proposed Development and outline Specialist Studies, included within the S&EIR process to assess these issues in further detail.
- Identify the key issues to be addressed in the assessment phase.
- Undertake a Public Participation Process (*PPP*) which provides all Stakeholders and Interested and Affected Parties (*I&APs*) with opportunities to be involved, including their views and concerns.
- Describe the methodology applied to conduct the scoping phase.
- Describe the Plan of Study (*Pos*) for the EIR phase (second phase of the S&EIR process), which describes the nature and extent of further investigations required in the EIR phase.

Following the commenting period, the Scoping Report will be updated and the Final Scoping Report (*FSR*) prepared for submission to the Competent Authority (*CA*) for consideration. If the *FSR* is accepted, the EIR phase will be initiated.

### 1.2 REPORT FORMAT AND LAYOUT

This report is the first of several reports which will be produced during the EIA Process. This report has been compiled in line with the provisions of Section 24N of the Act; and must include all the information specified in Regulation 21 and Appendix 2 of the EIA Regulations, promulgated under the NEMA and published as GNR 982 as amended. Appendix 2 clearly outlines the content of a Scoping Report, and Chapter 6, Sections 39-44 which cover the activities necessary for a successful PPP.

The layout of this Scoping Report is as follows:

1. **Chapter 1: Introduction** – Provides background information on the Proposed Development, a brief description of the EIA process required in terms of the EIA Regulations and reporting requirements, the details and expertise of the EAP who prepared this report and Specialists that have been appointed.
2. **Chapter 2: Project Description** – Provides a description of the Proposed Development, the properties on which the development is to be undertaken, the location of the development within these properties, and

the anticipated listed activities triggered. The technical details of the process to be undertaken are also provided in this Chapter.

3. **Chapter 3: Alternatives** – Provides a brief discussion of the feasible and reasonable alternatives to the Proposed Development which have been identified, and which will be investigated further in the EIR phase.
4. **Chapter 4: Legislative Framework** – Identifies all the legislation, guidelines, and plans that have been considered in the preparation of this Scoping Report.
5. **Chapter 5: Needs and Desirability** - Provides the context of the project in South Africa and outlines how it is likely to contribute towards reaching sustainability goals regionally, nationally, and internationally.
6. **Chapter 6: Description of the Receiving Environment** – Provides a brief overview of the bio-physical and socio-economic characteristics of the Project Area and immediate environment which could be affected by the Proposed Development. This information is compiled from published information and available spatial data, but it has been supplemented greatly by information which was gathered during site investigations by the EAP and Specialist team.
7. **Chapter 7: Potential Impacts on the Environment** – Provides a description of the key issues which have been identified by the project team in the Scoping phase thus far, as well as through pre-application consultation with the CA, which will be assessed in greater detail during the EIR phase through input from Specialists. It also discusses high-level mitigation measures for potential impacts, and the proposed method for further investigation during the EIR phase.
8. **Chapter 8: Public Participation Process** – Provides details of the PPP which has been conducted thus far, including:
  - The measures undertaken to notify I&APs of the application.
  - Proof that site notices, advertisements and notification letters which notify potential I&APs of the availability of the DSR have been displayed, placed or distributed.
  - A list of all persons and organisations which have been identified and registered in terms of Regulation 57 of the EIA Regulations as I&APs in relation to the application. It is noted that this Chapter will be updated to include all comments received during the PPP of the DSR.
9. **Plan of Study** – Sets out the proposed approach to the Environmental Impact Assessment (EIA) for the Proposed Development including:
  - A description of the scope of work that will be undertaken as part of the EIR phase, including any Specialist Studies or specialised processes, and the manner in which the described scope of work will be undertaken.
  - An indication of the stages at which the CA will be consulted.
  - A description of the proposed methodology for assessing the potential environmental impacts and alternatives, including the option of not proceeding (no-go alternative) with the Proposed Development.
  - Particulars of the PPP which will be conducted during the EIR phase.
10. **Chapter 10: Conclusion** – This chapter consists of the EAP’s concluding remarks of the Scoping phase and any specific recommendations for the EIR phase.
11. **Chapter 11: EAP Declaration**
12. **Appendices** – Supplementary information has been appended to this report, which includes:
  - Curriculum Vita (CVs) of the Project Team.
  - Record of Authority Consultation.
  - Public Participation Process information.
  - Site Photograph Plate.
  - Specialist desktop studies/Site Sensitivity Verification Reports.
  - Maps

### 1.3 DETAILS OF PROJECT TEAM

#### 1.3.1 APPLICANT DETAILS

The Applicant for the Proposed Development is ABO Ndau Solar Energy Facility 1 (Pty) Ltd, represented by ABO Wind. Further details of the Applicant are presented in **Table 5** below.

**Table 5: Applicant Details**

Applicant Details	
Company Name	ABO Ndau Solar Energy Facility 1 (Pty) Ltd
Company Registration No.	2023/594016/07
Contact Person	Zandri Hill
Telephone No.	021 276 3620
Cell phone No.	076 104 1372
Email	<a href="mailto:zandri.hill@abo-wind.com">zandri.hill@abo-wind.com</a>
Physical Address	Unit B1 Mayfair Square, Century Way, Century City, Western Cape, 7441

#### 1.3.2 COMPETENT AUTHORITY DETAILS

The Government Notice No. 779 (in GG 40110 of 1 July 2016) of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) identifies the Minister as the Competent Authority in instances where the activities related to the Integrated Resource Plan (IRP) 2010-2030.

The IRP 2010-2030 is a plan, among others, through which commitments to the United Nations Framework Convention on Climate Change (UNFCCC) regarding CO<sub>2</sub> mitigation action are being implemented. The 2010 – 2030 IRP for electricity generation identifies the diversification of the energy mix and the balance between renewable and non-renewable energy sources.

The proposed development is a large scale solar photovoltaic (PV) facility to generate renewable electricity and is in direct response to the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), as established by the Department of Energy under the IRP. Therefore, as per Government Notice No. 779 the DFFE is the Competent Authority. Further details of the CA are presented in **Table 6** below.

**Table 6: Competent Authority Details**

Competent Authority Details	
Competent Authority	Department of Forestry, Fisheries and the Environment ( <i>DFFE</i> )
Case Officer	To be confirmed
Telephone No.	012 399 8815
Cell phone No.	--
Email	To be confirmed
Physical Address	Environment House, 473 Steve Biko Road, Arcadia



**1.3.3 DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER**

Praxos was established in 2005, with the aim of providing professional services in Occupational Health, Safety and Environment (OHSE), as well as Social Participation/Facilitation and Management. Our team has the expertise in developing, managing, and maintaining successful programmes in various organisations structures. The team of Praxos has collectively over 50 years’ experience in delivering personalised and professional service to individuals, Corporates as well as Non-Profit organisations. By combining our clinical knowledge and expertise of human behaviour and working systems we help our clients to develop a clearer and broader understanding of the contemporary work environment.



Praxos is a 100% black owned, Level One Broad-Based Black Economic Empowerment (BBBEE) and operated empowerment company that currently operates throughout South Africa, that prides itself in delivering professional services. Our clients come first, and our team is registered with the South African Council for Natural Scientific Professions (SACNASP), Environmental Assessment Practitioners Association of South Africa (EAPASA), South African Council for the Project and Construction Management Professions (SACPCMP), South African Institute for Occupational Safety and Health (SAIOSH), and Association of Construction Health and Safety Management (ACHASM).

The Praxos team has substantial experience in planning, coordination, management and execution of a wide range of HSE projects. We aim to promote environmental sustainability and ensure compliance with HSE regulations. With our experienced team, the firm offers a full range of HSE services, and a proven track record that demonstrates technical excellence.

Our offerings broadly cover HSE solutions, assurance and auditing solutions, social facilitation, licensing services (EIAs, Water Use Licences [WUL], Waste Management Licences [WML], etc.), mining environmental services, environmental auditing, and strategic projects. We also make use of expert Specialist services to meet the client’s and project requirements.

In fulfilment with the legislative requirements, the details of the EAP and the environmental team that prepared this Scoping Report are provided below (please refer to **Appendix A** for the relevant members’ CVs).

**1.3.4 THE ENVIRONMENTAL ASSESSMENT PRACTITIONER**

Please refer to **Table 7** below for the contact details and expertise of the lead EAP.

**Table 7: Lead EAP Details**

<b>Lead Environmental Assessment Practitioner Details</b>	
<b>Company Name</b>	Praxos 373 (Pty) Ltd
<b>Name of EAP</b>	Richard Myburgh
<b>EAP Qualifications</b>	B.Sc. Hons. Geography
<b>Professional Registration</b>	EAPASA (2019/1037)

Lead Environmental Assessment Practitioner Details	
Summary of EAP's Experience	<p>An environmental scientist with eight (8) years of experience in the field of environmental management, Richard Myburgh specialises in various environmental fields including EIA facilitation, Water Use Licenses, Public Participation and other licencing and permitting processes. His key experience includes Environmental Auditing, Public Participation and Full EIAs, Basic Assessments, Water Use License Application and Mining Right Application processes. Richard Myburgh is also a registered Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioners Association of South Africa (EAPASA).</p> <p>Key experience includes:</p> <ul style="list-style-type: none"> <li>• Environmental Auditing.</li> <li>• Public Participation.</li> <li>• Basic Assessment Reports.</li> <li>• Full Scoping and EIAs.</li> <li>• Mining Right Applications.</li> </ul> <p>The full CV of the EAP is included in <b>Appendix A</b>.</p>
Telephone No.	011 453 8727
Cell phone No.	067 408 4795
Email	<a href="mailto:Richard.Myburgh@praxos373.co.za">Richard.Myburgh@praxos373.co.za</a>
Physical Address	31 Saint Margaret Street, Hurlyvale, Edenvale, 1611

### 1.3.5 ASSISTANT EAP

Please refer to **Table 8** below for the contact details and expertise of the assistant EAP.

**Table 8: Assistant EAP Details**

Assistant Environmental Assessment Practitioner Details	
Company Name	Praxos 373 (Pty) Ltd
Name of EAP	Carmen Krishandutt
EAP Qualifications	B.Sc. Honours Environmental Management
Professional Registration	EAPASA (2021/4105)
Summary of EAP's Experience	<p>Carmen Krishandutt is an environmental scientist with seven (7) years of experience of diverse disciplines in the environmental field. Carmen specialises in environmental consulting and environmental monitoring. Carmen has gained key consulting experience through her management of the following processes:</p> <p>Key experience includes:</p> <ul style="list-style-type: none"> <li>• Environmental Impact Assessments.</li> <li>• Basic Assessments.</li> <li>• Environmental Management Programmes.</li> </ul>

Assistant Environmental Assessment Practitioner Details	
	<ul style="list-style-type: none"> <li>Screening Assessments.</li> <li>Water Use Licence Applications.</li> <li>Surface and Marine Water Quality Monitoring.</li> <li>Ambient Air Quality and Dust fallout Monitoring.</li> <li>Report writing.</li> <li>Project management.</li> <li>Stakeholder engagement.</li> <li>Planning and co-ordination of public participation.</li> <li>Business development.</li> </ul> <p>The full CV of the EAP is included in <b>Appendix A</b>.</p>
<b>Telephone No.</b>	011 453 8727
<b>Cell phone No.</b>	084 343 8841
<b>Email</b>	<a href="mailto:Carmen.Krishandutt@praxos373.co.za">Carmen.Krishandutt@praxos373.co.za</a>
<b>Physical Address</b>	31 Saint Margaret Street, Hurlyvale, Edenvale, 1611

### 1.3.6 SPECIALIST DETAILS

A variety of Specialist assessments will be undertaken to discover and analyse the potential positive and negative impacts on the footprint of the Proposed Development. **Table 9** below indicates the Site Sensitivity Verification (SSV) reports that have been undertaken and details where further assessment will be required during the EIR phase.

**Table 9: Specialist Details**

Specialist Details		
Specialist Studies	Specialist	Status
<b>Agricultural Assessment</b>	John Phipson Mzansi Agriculture	The Agricultural Potential SSV report is included in <b>Appendix F1</b> .  The Agricultural Impact Assessment will be undertaken during the EIR phase.
<b>Archaeological &amp; Cultural Heritage Impact Assessment</b>	Francois P Coetzee on behalf of EnviroSaint (Pty) Ltd	The Cultural Heritage Desktop report is included in <b>Appendix F4</b> .  A Heritage Impact Assessment will be undertaken during the EIR phase.
<b>Aquatic Biodiversity &amp; Wetland Delineation Assessment</b>	Toni Belcher BlueScience (Pty) Ltd	The Aquatic SSV report is included in <b>Appendix F2</b> .  The Aquatic Impact Assessment will be undertaken during the EIR phase.

Specialist Details		
Specialist Studies	Specialist	Status
<b>Avifauna Impact Assessment</b>	Robyn Phillips Cossypha Ecological	The Avifaunal SVV report is included in <b>Appendix F3</b> .  The Avifaunal Impact Assessment will be undertaken during the EIR phase.
<b>BESS Risk Assessment</b>	Debra Mitchell iSHEcon	To be undertaken during the EIR phase.
<b>Ecological Impact Assessment (Fauna &amp; Flora)</b>	Johannes Maree on behalf of EnviroSaint (Pty) Ltd	The Terrestrial Ecological SSV report is included in <b>Appendix F8</b> .  The Terrestrial Ecological Impact Assessment will be undertaken during the EIR phase.
<b>Geotechnical Assessment</b>	Carel de Beer Bare Rock Consulting	The Geotechnical SSV report is included in <b>Appendix F5</b>  A Geotechnical Investigation will be undertaken during the EIR Phase.
<b>Geohydrological Impact Assessment</b>	Marius van Biljon on behalf of EnviroSaint (Pty) Ltd	The Geohydrological Desktop report is included in <b>Appendix F5</b> .  A Geohydrological Impact Assessment will be undertaken during the EIR Phase.
<b>Palaeontological Desktop Assessment</b>	Jacobus Francois Durand on behalf of EnviroSaint (Pty) Ltd	The Cultural Heritage SSV report including Palaeontology sensitivity is included in <b>Appendix F4</b> .  The palaeontological sensitivity map available from the SAHRIS database indicates the site is located within a grey (zero) and blue (low) sensitivity.  The Palaeontologist has confirmed that no further palaeontological assessment will be required for the survey footprints.
<b>Socio-Economic Impact Assessment</b>	Urban Econ	The Socio Economic SSV report is included in <b>Appendix F7</b> .  Socio-Economic Assessment to be undertaken during the EIR phase.

Specialist Details		
Specialist Studies	Specialist	Status
Traffic & Transport Impact Assessment	Iris Wink iWink Consulting	A Transport Impact Assessment will be undertaken during the EIR phase.
Visual Impact Assessment (including Glint & Glare)	Jon Marshall Environmental Planning and Design	The Visual SSV report is included in <b>Appendix F6</b> .  Visual Impact Assessment to be undertaken during the EIR phase.

#### 1.4 ASSUMPTIONS & LIMITATIONS

The assumptions and limitations listed below are applicable to the undertaking of this DSR by the EAP:

- The information provided by the Applicant and the Specialists to the EAP were precise and were pertinent to the preparation of the DSR.
- A GA/WUL will be required, separate to this S&EIR process, as the Proposed Development is located within 32 m of seasonal streams/drainage lines located adjacent to the facility.
- All obligatory permits (e.g., alien and listed invasive species, protected tree permits etc.) will be applied for and obtained by the Applicant and is therefore beyond the scope of this S&EIR process.
- All considered and presented alternatives for the Proposed Development can be executed.
- Throughout the duration of the S&EIR process of the project, the identifying and registering of I&APs will be undertaken on a continuous basis and the I&AP database will continue to be updated.
- Comments that will be received from I&APs through the communication channels provided during the PPP will be responded to, in consultation with Specialists but within the legal allowances, towards changes to this DSR and the preparation of the FSR.

## 2. PROJECT DESCRIPTION

### 2.1 PROPOSED PROJECT ACTIVITY

#### 2.1.1 PROJECT OVERVIEW

The Ndau project/cluster comprises the following three facilities:

1. Ndau Solar Energy Facility 1 and associated infrastructure.
2. Ndau Solar Energy Facility 2 and associated infrastructure.
3. Ndau Battery Energy Facility and associated infrastructure.

Each facility will require a stand-alone EA, thus requiring separate applications and environmental assessment processes. It is however intended to combine the required PPP of the three applications where possible. For the purpose of this EA application, this report solely focuses on the **ABO Ndau Solar Energy Facility 1 and associated infrastructure** (hereinafter referred to as 'Ndau 1' or the 'Proposed Development').

#### 2.1.2 NDAU SOLAR ENERGY FACILITY 1

ABO Ndau Solar Energy Facility 1 (Pty) Ltd proposes the development of Ndau 1, a PV solar energy generation facility, of up to 120 MW in capacity, and associated infrastructure with a total footprint of 136 ha, located on Portion 19 of the Farm Rietvley No. 13, and the Remaining Extent of the Farm Rietvley No. 13 (access road only), 27 km south-west of Polokwane within the Limpopo Province.

The Project Area falls within the jurisdiction of the PLM, within the Capricorn District. The Proposed Development is located within the International Strategic Transmission Corridor, as stipulated in Government Notice No. 113 of Government Gazette No. 41445 published on 16 February 2018. The Proposed Development is not located within a Renewable Energy Development Zone (REDZ) and is not classified as Electricity Grid Infrastructure (EGI).

A development area has been identified for the Proposed Development. Within this identified development area, a maximum development footprint has been defined in a manner which has considered the environmental sensitivities present on the affected property and which intentionally remains beyond highly sensitive areas. The affected property has been considered in this S&EIR process (which includes the independent Specialists' assessments undertaken) and assessed in terms of its suitability from an environmental and social perspective.

The Proposed Development is located outside an urban area and industrial complex with a current zoning that is agricultural in nature. A change in zoning will be required from agricultural to special use.

The Proposed ABO Ndau Solar Energy Facility 1 would comprise the following (to be located within a proposed maximum development footprint):

- Solar Field/Solar Arrays (Note that the foundations, mounting structures and module types will be confirmed during detail design, however, would remain within the proposed development footprint and be approximately 3.5m in height);
- Internal service roads (noting that existing farm roads will be used as far as possible, and that the maximum road width will be 8m);
- An access road (noting that existing farm roads/jeep tracks will be used as far as possible, and the maximum road width will be 10m);

- An on-site substation hub and associated infrastructure (such as substation, transformation infrastructure, collector infrastructure, step-up infrastructure, battery energy storage system etc.) including auxiliary buildings (such as operation & maintenance buildings, admin buildings, workshops, gatehouse, security building, offices, visitor centre, warehouses, etc.) contained within a 5-ha footprint; and
- A communications tower as part of the 5 ha on-site substation hub footprint with a maximum height of 32m.

Associated infrastructure would include the following (to be located within the proposed maximum development footprint):

- Internal electrical reticulation (i.e., low- and medium voltage cables) to be placed underground where feasible; and
- Perimeter fencing.

A temporary laydown area would be established during the construction period but would be within the maximum development footprint which has been assessed i.e., within the fenced area allocated for development and beyond any identified no-go areas. The laydown area would move as required while construction is underway.

The proposed facility will be accessed from the north via an existing unnamed road and/or from the east also via an existing farm road. The detailed design of the proposed access and road upgrade requirements will be as per the recommendations of the Transport Impact Assessment which is being undertaken as part of the S&EIR process.

In terms of connecting to the electricity grid, technical alternatives are available and application for grid connection will be made through a separate process and assessed accordingly.

#### Alternatives:

The proposed development as described above has been assessed with the following alternatives:

1. Layout: A second access route of 1.3 km will be assessed as an alternative or potential second access route during the EIA phase. This is an existing farm access route running through the same property as the Proposed Development. Consultation will first need to be undertaken between the Applicant and the landowner to determine if they would be given permission to use this route.
2. Technology: With regard to the proposed Battery Energy Storage System (BESS), the technology thereof is dynamic and so the specific type/technology to be developed would be selected based on market demands and technology availability at the time of construction. Therefore, both Lithium-ion and redox-flow are to be assessed as technology alternatives, with Lithium-ion being the current preferred technology. The Lithium-Ion BESS will arrive to site pre-assembled.

The no-go alternative will also be assessed.

A pre-liminary site layout of the PV area, proposed location of the on-site substation hub and access roads can be seen on the maps included in **Appendix G**.

### 2.1.3 CIVIL SERVICES

#### a) Electricity

The operations of the Proposed Development would require some servicing, noting that the operational electrical requirements (i.e., auxiliary buildings) would be nominal and would be supplied by the facility itself.

#### b) Water and Sanitation

Water would be required for sanitation by operational staff, for washing of solar panels and for dust control on internal roads (where necessary). Operationally, staff would be encouraged to use water sparingly. The PV panels would be washed as part of a maintenance schedule (this is expected to typically be twice per year but would depend on site and weather conditions) or after high-dust events (i.e., not daily). The panels can also be washed with non-potable water, where feasible. Furthermore, washing would either be with clean water, or using bio-degradable/green detergents/soaps.

Water would preferably be sourced from the local municipality in terms of a Service Level Agreement established between the Municipality and the facility. A non-binding confirmation of capacity from the LM was requested by the applicant in June 2023, with the view to have the confirmation in hand at draft EIR stage. If this is not possible, then other options for water supply will be investigated such as sourcing water commercially. Where required, a storage tank (i.e., Jo-Jo tank) of up to approximately 10,000L may be used on site for temporary water storage.

Sanitation requirements would be minimal, given that there would only be a small staff complement during the operations of the facility. Sanitation for auxiliary buildings would be connected to the existing municipal sewage system. If the Municipality does not approve, or not have capacity for such a connection, sewage would be stored in a conservancy tank and collected either by a honey-sucker truck or by a service provider for treatment at a licensed disposal site. Alternatively, a standalone system would be used (i.e., porta-loos) which would be regularly serviced by an independent contractor. Note that it is not intended to make use of soakaways or on-site treatment solutions.

Water and sanitation requirements during the construction phase will be the primary responsibility of the appointed Contractor. It would be preferable for water to be sourced from the local Municipality, if available, with alternative arrangements to be made where required (for example transporting water to site with trucks).

No bulk service infrastructure is proposed. Any new sewage lines (if required) would be constructed within the road limits of either existing or new internal roads, noting that these would be limited as they are only necessary for servicing the auxiliary buildings.

#### c) Solid Waste

During the construction phase waste such as oily rags, containers, rubble, etc would be produced. Solid waste produced during construction would be managed in accordance with the specifications of the site-specific EMPr. The Contractor would be responsible for waste management in this regard. During the operational phase waste would emanate from the auxiliary buildings and would largely comprise office-type waste such as packaging, paper, food waste, as well as waste from the maintenance aspects which would comprise packaging, metals, cement, glass, etc. These wastes would also be controlled through the operational EMPr.



Refuse/solid waste produced on site, during the operational phase, would be minimal (approximately two wheelie bins per week are anticipated) and would ideally be removed by the Municipality, however, if this is not possible, the Proposed Development would employ private contractors to remove the refuse and dispose of it appropriately.

Disposal of batteries will be done in accordance with South African Regulations (by the supplier). When a battery module reaches its end of life or needs to be replaced, it will be returned to the original manufacturer for disassembly and further processing.

Solid and hazardous waste produced during the construction phase would be managed in accordance with the specifications of the site-specific EMPr.

d) Stormwater

There are no specific stormwater and/or landscaping initiatives proposed as part of the Proposed Development at this stage, but any interventions prescribed by the relevant Specialist/s through the environmental impact assessment process would be implemented with further management measures also being addressed in the EMPr.

## 2.2 PROJECT LOCATION AND SITE DESCRIPTION

The Proposed Development is located on Portion 19 of the Farm Rietvley No. 13 and the Remaining Extent of the Farm Rietvley No. 13 (access road only) and is known as the Ndau 1 site (*Project Area*). The Project Area is located adjacent to the N1 road and measures 136 ha in extent. Refer to the locality map in **Figure 2** below and **Appendix G**.

The Project Area is located within the jurisdiction of the PLM, within the Capricorn District, near the city of Polokwane, Limpopo Province. The nearest residential areas are the suburb of Manyapje in the North, the suburb of Ga-Sebati in the East, the village of Mogoto in the South and Tshamahansi (a large, populated semi-urban rural township) in the West. The direction and distance from the Project Area to some of the nearest residential areas are indicated in

**Table 10** below.

**Table 10: Residential Areas in Proximity to the Project Area**

Town	Distance (km)	Direction
Manyapje (Suburb)	15	North
Polokwane (City)	27	North-East
Ga-Sebati (Suburb)	43	East
Bergnek (Village)	18	South-East
Mogoto (Village)	33	South
Mokopane (Town)	25	South-West
Tshamahansi (Township)	24	West
Ga-Mashashane (Village)	15	North-West

The immediate surroundings of the Project Area are sparsely populated and largely undeveloped, vacant land. The Percy Fyfe Nature Reserve is 2 km North-West of the Project Area, whereas there are a few agricultural farms, a bush lodge and a local restaurant East of the Project Area. The Project Area and adjacent properties are zoned as “Agricultural”. Refer to **Table 11** for the surrounding land uses to the Project Area.

**Table 11: Surrounding Land Uses**

<b>Direction</b>	<b>Distance</b>	<b>Land Uses</b>
<b>North</b>	0.0 km	Vacant Land
	1.07 km	Private Property (Small farm)
<b>North-east</b>	0.0 km	Vacant Land
	1.25 km	Ysterberg Lodge
	2.5 km	Caltex Fuel Station
<b>East</b>	0.0 km	Vacant Land
	2.7 km	Wildthingz Bush Lodge
	4.8 km	Protea by Marriott Hotel Polokwane Ranch Resort
	5.68 km	Twin Towers Restaurant
<b>South-east</b>	0.0 km	Vacant Land
	1.35 km	Private Property (Residential)
	1.85 km	Private Property (Residential)
<b>South</b>	1.04 km	Private Property
<b>South-west</b>	640 m	Private Property (Residential)
	1.14 km	Private Property (Residential)
<b>West</b>	0.0 km	Vacant Land
<b>North-west</b>	60 m	Geyser Traction Substation
	1.60 km	Private Property (Residential)
	2 km	Percy Fyfe Nature Reserve

The Project Area occurs in Ward 1 of the Polokwane Local Municipality. The property on which the facility would be located, Portion 19 of the Farm Rietvley No. 13, is currently part of a single title deed made out to Macario Property Investments, with Title Deed number: T59902\_2010. The proposed access road would be located on the Remaining Extent of Farm Rietvley No. 13. Refer to **Table 12** for the property description and Surveyor General (SG) Codes for the Project Area.

**Table 12: SG Code and Property Description**

<b>Property Description</b>	<b>SG Code</b>	<b>Extent (Ha)</b>
Portion 19 of the Farm Rietvley No. 13	<b>TOKS00000000001300019</b>	<b>289.51</b>
Remaining Extent of Farm Rietvley No. 13 (access road only)	<b>TOKS00000000001300000</b>	<b>289.51</b>
<b>Total</b>		<b>579.02</b>

Refer to **Table 13** below for the GPS co-ordinates of the Project Area boundary.

**Table 13: GPS Co-ordinates of the Corner Points of the PV Facility**

<b>Corner Points</b>	<b>Latitude</b>	<b>Longitude</b>
<b>Point 1</b>	24° 2'59.33"S	29°12'56.17"E
<b>Point 2</b>	24° 3'15.16"S	29°12'50.45"E
<b>Point 3</b>	24° 3'21.82"S	29°13'8.32"E
<b>Point 4</b>	24° 3'22.23"S	29°13'22.69"E
<b>Point 5</b>	24° 3'8.01"S	29°13'55.02"E
<b>Point 6</b>	24° 2'38.90"S	29°13'30.39"E
<b>Central Point</b>	24° 3'8.16"S	29°13'22.28"E

Refer to **Table 14** and **Table 15** for the co-ordinates of the proposed access road.

**Table 14: GPS Co-ordinates for the proposed access road: Alternative 1**

<b>Corner Points</b>	<b>Latitude</b>	<b>Longitude</b>
<b>Start</b>	24° 1'56.31"S	29°14'2.98"E
<b>Middle</b>	24° 2'35.85"S	29°13'33.83"E
<b>End</b>	24° 2'51.80"S	29°13'8.04"E

**Table 15: GPS Co-ordinates for the proposed access road: Alternative 2**

<b>Corner Points</b>	<b>Latitude</b>	<b>Longitude</b>
<b>Start</b>	24° 2'13.41"S	29°14'0.73"E
<b>Middle</b>	24° 2'40.53"S	29°13'54.53"E
<b>End</b>	24° 2'52.63"S	29°13'41.59"E

In addition to the above, the EAP has also identified all the Solar developments with an approved Environmental Authorisation within 30 km of the proposed project areas. Please refer to **Table 16** below.

**Table 16: Solar developments with an approved Environmental Authorisation within 30 km of the proposed project area**

<b>No</b>	<b>EIA Reference No</b>	<b>Classification</b>	<b>Status of application</b>	<b>Capacity (MW)</b>	<b>Distance from proposed area (km)</b>
<b>1</b>	14/12/16/3/3/1/634	Solar PV	Approved	10	24.1
<b>2</b>	12/12/20/2153	Solar PV	Approved	30	13.9
<b>3</b>	12/12/20/2352	Solar PV	Approved	8	26.5
<b>4</b>	14/12/16/3/3/2/1049	Solar PV	Approved	90	24.9

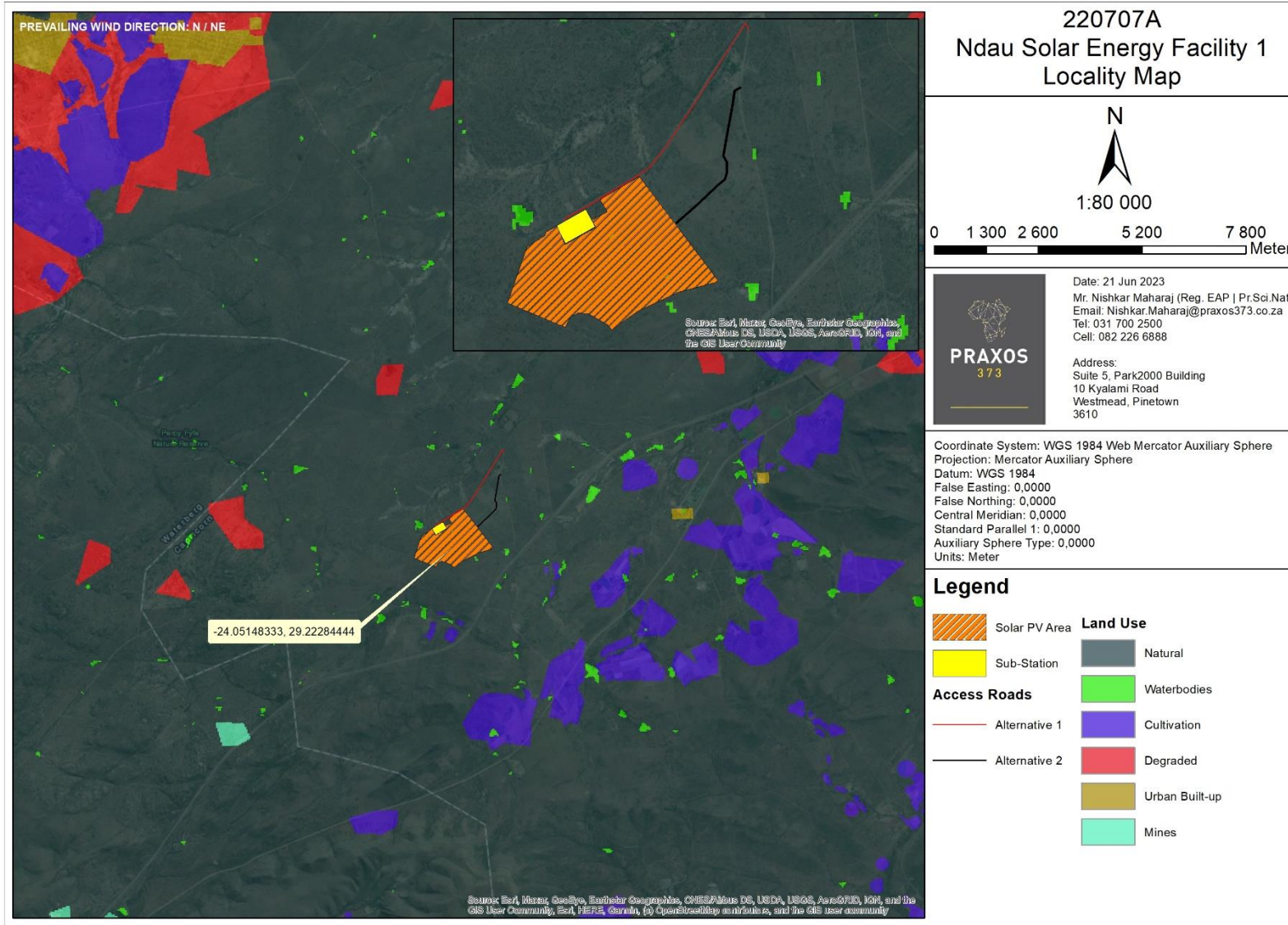


Figure 2: Locality Map (Praxos, 2023)

## 2.3 TECHNICAL INFORMATION ON PROPOSED ACTIVITY

The technical information available at this very early stage of project development and the S&EIR process is included in the sub-sections below.

### 2.3.1 DESIGN OF PV PANELS

The exact design of the PV Panels will be confirmed during the detail design stage. For the purpose of this application, a 'PV Area' where panels will be installed has been defined and will be assessed. It is anticipated that the mounting structures for the PV panels will either fixed-tilt, single-axis tracking or double-axis tracking PV. Module types would be either mono-facial or bi-facial and would be up to 3.5 m in height. At present, the width of the PV panels cannot be specified as it is dependent on the module type. However, it should be noted that the PV panel width will not be considered as an abnormal load and therefore would be able to be transported by a standard sized truck.

### 2.3.2 BESS TECHNOLOGY

A BESS with a 500 MW/MWh storage capacity would be developed within the substation compound footprint, if required. With regard to the proposed BESS, the technology thereof is dynamic and so the specific type/technology to be developed would be selected based on market demands and technology availability at the time of construction. Therefore, both Lithium-ion and redox-flow are to be assessed as technology alternatives, **with Lithium-ion being the current preferred technology**. It should be noted that the Lithium-ion BESS will arrive to site pre-assembled. Any maintenance, service or repairs required to be carried out on the BESS will be conducted by the supplier's personal or their authorised agent. When a battery module reaches its end of life or needs to be replaced, it will be returned to the original manufacturer for disassembly and further processing. Disposal of batteries will be done in accordance with South African Regulations (by the supplier). Lithium-ion batteries (**preferred**) is a solid-state battery i.e., the electrolyte (which is considered hazardous) is contained within the battery. As part of the installation and maintenance of the Redox Flow batteries (the alternative technology which is not preferred) electrolyte may need to be stored and handled on site. Further details are provided in **Section 3.4** of this report.

## 2.4 IDENTIFIED LISTED ACTIVITIES

The EIA Regulations allow for a Basic Assessment (BA) process for activities with limited environmental impact (listed in GNR 983 & GNR 985), and a more rigorous two-tiered approach which is the Scoping and EIA process for activities with potentially greater environmental impact (listed in GNR 984).

The Proposed Development activities trigger the need for a Scoping and EIA process in accordance with the EIA Regulations. The listed activities which are being applied for are provided in **Table 17** below.

**Table 17: Listed Activities Triggered by the Proposed Development**

Listed Activities as set out in Listing Notice 1 (GNR 983)		
No.	Description of Activity	Reference to the Proposed Development
11 (i)	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	The Proposed Development will include a substation/ collector infrastructure with a capacity of 132 kV.

No.	Description of Activity	Reference to the Proposed Development
		<p>The Proposed Development will include underground cables for internal electrical reticulation, however the capacity of these lines will not exceed 33 kV and is expected to be within the range of 22 – 33 kV.</p> <p>The Proposed Development is located outside an urban area and industrial complex.</p>
12 (ii) (b)	<p>The development of—</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>Where such development occurs –</p> <p>(b) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</p>	<p>The layout of the Proposed Development has been designed to avoid sensitive aquatic environments on the affected property.</p> <p>A portion of the Proposed Development and associated infrastructure (exceeding 100 sqm) would however be located within 32 m of seasonal streams/drainage lines located adjacent to the facility.</p> <p>There would also be some infilling of dams on site which have been mapped as artificial wetlands of low sensitivity to allow for development.</p>
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>The infilling of artificial wetlands to allow for development on site will exceed the 10 cubic metres threshold stipulated by this Listed Activity.</p>
24 (ii)	<p>The development of a road—</p> <p>(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.</p>	<p>An access road will be constructed to access the Proposed Development. This access road will follow existing farm roads as far as possible. The maximum access road width will be 10 m. Internal roads would be 8 m in width (maximum).</p>
28 (ii)	<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:</p> <p>(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.</p>	<p>The Proposed Development is defined as an industrial development which would occur outside an urban area. The Proposed Development will extend across an area of 136 ha which exceeds the 1 ha threshold. The proposed development is outside an urban area and the current land use within the development footprint is for agriculture.</p>



No.	Description of Activity	Reference to the Proposed Development
56 (ii)	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre— (ii) where no reserve exists, where the existing road is wider than 8 metres.	Where possible existing farm roads on site will be used and upgraded if required. The access road will be widened to a maximum width of 10 m.  Where possible, existing farm roads would also be used and lengthened as part of the internal road network, and lengthening would exceed 1 km.  The proposed development would occur outside an urban area.

**Listed Activities as set out in Listing Notice 2 (GNR 984)**

No.	Description of Activity	Reference to the Proposed Development
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 Development will entail the construction of a new 120 MW photovoltaic solar facility which exceeds the 20 MW threshold stipulated by this Listed Activity. The Project Area is located outside an urban area no existing infrastructure is present.
15 (i)	The clearance of an area of 20 hectares or more of indigenous vegetation excluding where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity.	The cumulative vegetation clearance of 133 ha to allow for the development of non-linear infrastructure (i.e., the on-site sub-station hub and foundations for the solar PV arrays) will exceed 20 hectares.

**Listed Activities as set out in Listing Notice 3 (GNR 985)**

No.	Description of Activity	Reference to the Proposed Development
3 (e) (i) (gg)	The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) is to be placed on a site not previously used for this purpose; and (b) will exceed 15 metres in height – but excluding attachments to existing buildings and masts on rooftops.  e. Limpopo i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding disturbed areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.	A communications tower with a maximum height of 32m is proposed as part of the on-site substation hub and will be located on a site that was not previously used for this purpose.  The Proposed Development is located outside an urban area and within 2 km from the Percy Fyfe Nature Reserve which is a designated protected area in terms of NEMPAA.



No.	Description of Activity	Reference to the Proposed Development
	(gg) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas.	
4 (e) (i) (gg)	<p>The development of a road wider than 4 metres with a reserve less than 13.5 metres.</p> <p>e. Limpopo i. Outside urban areas: (gg) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas.</p>	<p>Roads developed for the Proposed Development will be a maximum of 10 m wide. Existing farm roads would be used as far as possible and upgraded.</p> <p>Road development would occur within 2 km from the Percy Fyfe Nature Reserve which is designated protected areas in terms of NEMPAA. The Project Area is located outside urban areas.</p>
14 (ii) (c) (e) (i) (hh)	<p>The development of - (ii) infrastructure or structures with a physical footprint of 10 square metres or more;</p> <p>Where such development occurs— (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p>e. Limpopo i. Outside urban areas: (hh) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve.</p>	<p>A portion of the Proposed Development and associated infrastructure (exceeding 10 sqm) would be located within 32 m of seasonal streams/drainage lines located adjacent to the facility.</p> <p>There would also be some infilling of dams on site which have been mapped as artificial wetlands of low sensitivity to allow for development.</p> <p>Development within/close to watercourses would occur within approximately 2 km from the Percy Fyfe Nature Reserve which is a designated protected area in terms of NEMPAA. The Project Area is located outside urban areas.</p>
18 (e) (i) (gg)	<p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 Kilometre.</p> <p>e. Limpopo i. Outside urban areas: (gg) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas.</p>	<p>Where possible, existing roads on site will be used and upgraded if required. The access road will be widened to a maximum width of 10 m.</p> <p>Where possible, existing farm roads would also be used and lengthened as part of the internal road network, and lengthening would exceed 1 km.</p> <p>Road construction would occur within 2 km from the Percy Fyfe Nature Reserve which is designated protected areas in</p>



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<b>No.</b>	<b>Description of Activity</b>	<b>Reference to the Proposed Development</b>
		terms of NEMPAA. The Project Area is located outside urban areas.

### 3. ALTERNATIVES

In terms of the NEMA and the EIA Regulations, the purpose of 'alternatives' in an EIA is to promote sustainable development by requiring the Applicant to identify and assess a range of alternatives to the Proposed Development during the scoping phase. The aim is to ensure that the Proposed Development minimizes its negative impacts on the environment and maximizes its benefits for society, while taking into account the costs and feasibility of the different options. This could include identifying a range of reasonable and feasible alternatives that could potentially achieve the same objectives of the Proposed Development, but with different approaches or in different locations.

By evaluating alternatives in an EIA, decision-makers can make informed choices about which course of action to take based on the potential environmental, social, and economic impacts of each option. This allows for a more comprehensive and objective assessment of a project and helps to identify opportunities to reduce or avoid negative impacts.

In some cases, alternatives identified through the EIA process may result in modifications to the design, location, or technology used.

Both the biophysical and socio-economic aspects are considered when investigating alternatives. The term "alternatives" as per GNR 982 is defined as follows:

*"...in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to:*

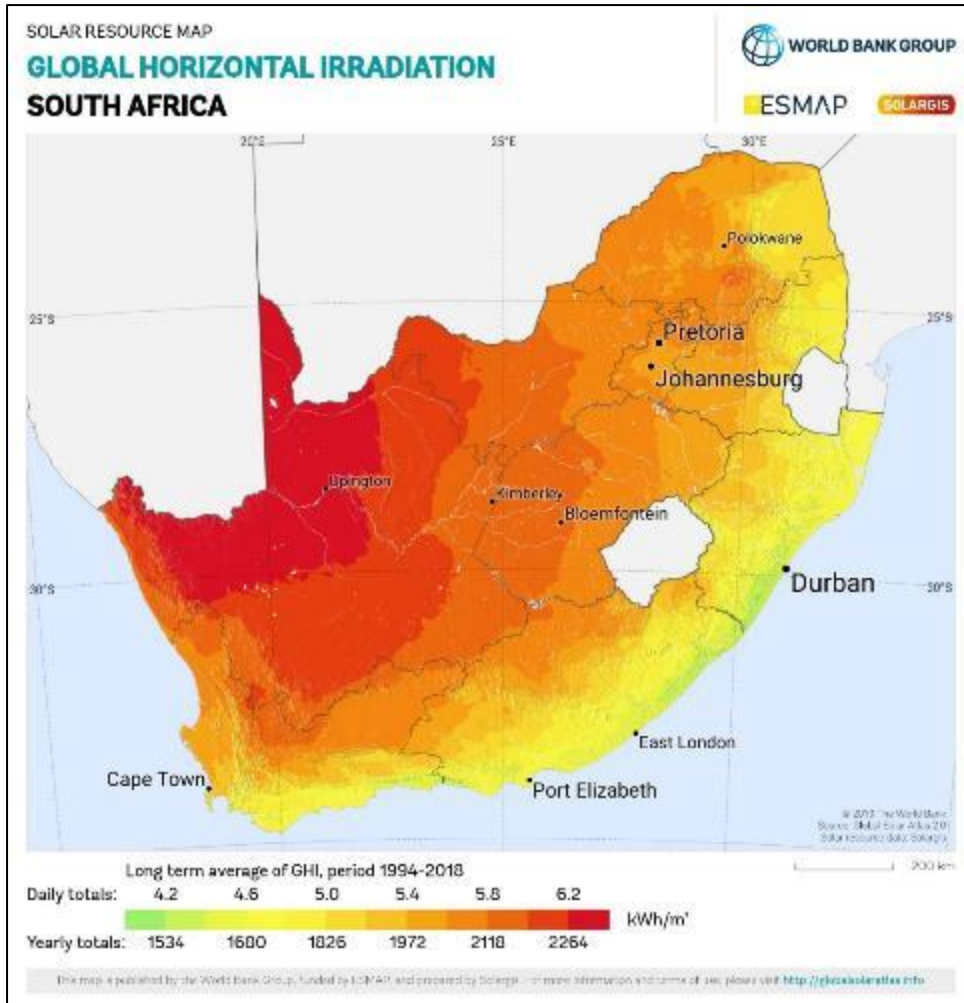
- a) The property on which or location where it is proposed to undertake the activity;*
- b) The type of activity to be undertaken;*
- c) The design or layout of the activity;*
- d) The technology to be used in the activity;*
- e) The operational aspects of the activity; or*
- f) The option of not implementing the activity."*

All proposed alternatives are described below. During the EIR phase of the project, the alternatives identified below will be investigated further and the preferred alternatives will be identified.

#### 3.1 LOCATION ALTERNATIVE

As indicated in preceding sections, the Proposed Development is located near the city of Polokwane in the Limpopo Province of South Africa, which has become a popular location for solar PV farms due to good solar irradiation levels and a relatively low population density, making it a suitable location for large-scale solar PV projects. The location of the Proposed Development was selected based on the factors described below.

**Solar irradiance:** Solar irradiance is an important factor to consider when planning solar energy projects as it directly affects the amount of electricity that can be generated by solar panels. Regions with higher solar irradiance receive more solar energy per unit area, and therefore are more suitable for solar energy projects. Areas with lower solar irradiance may not be as efficient for solar energy generation and may require larger solar panel arrays to produce the same amount of electricity as a smaller array in a region with higher solar irradiance. As per the map in **Figure 3** below generated from the Global Solar Atlas, the Project Area is situated in an area of high levels of solar irradiance, with values of between 2197 and 2216 kilowatt hours per square meter (kWh/m<sup>2</sup>). This level of solar irradiance makes the Project Area an ideal location for a solar PV facility.



**Figure 3: Solar Irradiation (Source: Global Solar Atlas, 2023)**

**Land availability:** The availability of land is a critical criterion in the location selection process. The location of the Project Area within a rural context is preferred to an urban area where dense development would shade the PV facility. Fortunately, there are extensive open areas of land in Limpopo that are suitable for such installations, with low levels of human habitation, which reduces the impact on local communities. The farms consisting of the Project Area were identified through desktop screening. The Applicant has entered into agreements with the landowners within the development footprint to secure sufficient land for the Proposed Development. The Project Area is of a suitable size to provide a viable solar PV facility, whilst ensuring that environmental sensitivities are not compromised. Considering that the buildable section of the Project Area is unsuitable for productive soil cultivation and crop harvesting, the suggested industrial land-use is deemed suitable.

**Topography:** The topography of a site can impact the efficiency and cost-effectiveness of a solar PV project. The ideal topography for these types of projects is generally flat or gently sloping land with minimal shading from trees, buildings, or other structures. The orientation of solar PV panels is an important consideration when determining the optimal topography for a project. Solar panels are typically installed facing north in the Southern Hemisphere to maximise exposure to the sun. This orientation allows the panels to capture the most sunlight throughout the day, as the sun moves from east to west. Sloping terrain can affect the orientation of solar panels, and special mounting systems may be required to ensure that the panels are angled correctly. The topography of the Project Area can be described as gently undulating with a range in altitude from around 1397 m to 1516 m above mean sea level and was therefore deemed to be acceptable in terms of slope and shading.

**Road Network:** The Project Area is accessible via district roads which would need to be upgraded to allow for easy access of the construction vehicles. These district roads connect to the N1 which is approximately 6 km from the Project Area by road.

**Proximity to transmission infrastructure:** The proximity to existing transmission infrastructure can significantly reduce the cost of developing renewable energy projects by minimising the need for new transmission lines. The Proposed Development is located within the International Strategic Transmission Corridor. These are areas where long term electricity grid infrastructure will be developed. There are two 132 kV lines and an Eskom substation adjacent to the Project Area which provide a good opportunity for connection to the national electricity grid in the future. These are under consideration but would be subject to a separate EIA process.

As a result of the factors outlined above, the chosen location for the Proposed Development is considered to be the most suitable, therefore no alternatives will be further investigated.

### 3.2 LAND USE ALTERNATIVE (TYPE OF ACTIVITY)

The Proposed Development will be for the construction of a solar PV facility for the generation of electricity. It is the type of activity chosen by the Applicant due to several factors including location (as outlined in the previous section), climate, economic viability, and the need and desirability. Therefore, no alternatives will be investigated further during the EIR phase in respect to activity alternatives.

### 3.3 DESIGN/LAYOUT ALTERNATIVES

During the Scoping phase of the Proposed Development, the DFFE Screening Tool was used to determine the environmental sensitivities of the Project Area. Subsequently, a team of Specialists conducted SSV's on terrestrial and aquatic biodiversity, avian life, agricultural potential, cultural heritage, and geohydrology. The mitigation hierarchy was applied to determine the suitable areas for construction (buildable areas), areas that need to be avoided, and the necessary buffers to be applied around the sensitive areas to mitigate potential impacts. In addition, the landowner was consulted to ascertain which areas of the property were to be excluded from development activities.

The layout of the Proposed Development and its associated infrastructure was thereafter considered and developed based on the findings of each Specialist, together with the allowable buildable areas defined by the landowner. Further detailed studies will be undertaken on the areas affected by the proposed design/ layout and a more detailed analysis will be conducted during the EIR phase. Presently, there are no layout alternatives that are being considered for the solar installation because, according to the available information, the existing layout is considered to be a low-impact development deliberately designed to avoid highly sensitive areas.

Although one (1) access point to site is envisaged, two (2) potential alternative routes have been identified and will be assessed as alternatives during the EIR Phase. Access Road Alternative 1 will enter the site from the north via an existing unnamed road while Access Road Alternative 2 will access the site from the east (also via an existing farm road). Existing roads will be utilised as far as reasonably possible and upgraded where necessary. Roads would be up to 10 m wide. The detailed design of the proposed access and road upgrade requirements would be as per the recommendations of the TIA (which will be undertaken during the EIR Phase).

### 3.4 TECHNOLOGY ALTERNATIVE

The Proposed Development will utilise solar PV technology for the generation of electricity. Solar PV technology is a method of harnessing the energy from the sun and converting it directly into electricity. It works through

the use of photovoltaic cells, which are made of semiconducting materials such as silicon. The cells are activated by sunlight, which stimulates the movement of electrons and results in the production of an electric current. This current can be used immediately or stored in batteries for later use. This technology can be used in a variety of settings, from small residential installations to large-scale solar farms. It is a popular and increasingly cost-effective form of renewable energy and is considered one of the key technologies for reducing carbon emissions and combating climate change. Solar PV can be used in combination with other energy sources such as batteries, wind turbines, or grid power to create a hybrid energy system that can provide reliable and sustainable power.

### **Battery Technology**

BESS is a system that stores excess energy generated by renewable energy sources in chemical form and can release it as electrical energy when it is needed. These energy storage systems can help to smooth out fluctuations in energy supply and demand and can help to ensure that energy is available when required. The Applicant will consider two types of BESS as detailed below.

**Lithium-Ion Batteries (Preferred):** These batteries are the most commonly used batteries in BESS. They are lightweight, have a high energy density, and can be charged and discharged quickly. They are also widely used in consumer electronics and electric vehicles. BESS with lithium-ion batteries can store excess energy generated by the solar panels during peak sunlight hours and release that energy during times when there is less sunlight, such as at night or on cloudy days. Lithium-ion batteries have a high energy density, meaning they can store a large amount of energy in a relatively small space. They also have a long lifespan and can be charged and discharged multiple times without losing capacity, making them a cost-effective solution for energy storage. In addition, lithium-ion batteries are modular and can therefore be configured in a variety of ways to meet the specific needs of the solar PV facility. They can also be easily integrated with inverters and other control systems to optimise the charging and discharging of the battery.

**Redox-Flow Batteries (Alternative):** Redox-flow batteries are a type of rechargeable battery that store energy in a liquid electrolyte solution. Unlike lithium-ion batteries that use a solid electrolyte, flow batteries separate the energy storage component from the power generation component. This allows the energy capacity of the battery to be easily increased or decreased by adjusting the volume of the electrolyte. They have a longer lifespan than lithium-ion batteries as the electrolytes can be easily replaced when they start to degrade over time. In addition, flow batteries can be charged and discharged simultaneously, allowing for continuous power output. Flow batteries are still a relatively new technology and are not yet widely used in solar PV facilities. However, they have potential for large-scale energy storage applications, such as providing backup power to the electric grid during peak demand periods.

Since BESS technology is dynamic, the Applicant will determine the specific technology to be developed based on market demands and technology availability at the time of construction. Accordingly, both lithium-ion and redox-flow batteries will be assessed as technology alternatives during the EIR phase, with lithium-ion currently being the preferred technology.

## **3.5 OPERATIONAL ALTERNATIVE**

There are no operational alternatives considered for the Proposed Development given the nature of the development which only allows for electricity generation during operations.

## **3.6 NO - GO ALTERNATIVE**

The 'no-go' alternative refers to the option of not proceeding with the Proposed Development due to significant adverse environmental impacts that cannot be adequately mitigated or avoided. It is only considered after all

reasonable measures to mitigate or avoid adverse environmental impacts have been explored and evaluated. It is an important option in the EIA process, as it ensures that environmental considerations are taken into account when making decisions about whether or not to proceed with a project.

If the Proposed Development is not approved, all of the preliminary impacts identified in the following Chapter during the construction and operational phases will not occur. However, it is worth noting that South Africa is currently facing an energy crisis, with frequent power shortages and blackouts. The country's electricity supply is heavily strained and reliant on coal-fired power plants, which are old, outdated, and struggle to meet the growing demand for electricity. Lack of maintenance due to budget constraints has also resulted in increased downtime and reduced capacity, contributing to the country's electricity supply challenges.

South Africa has recognised the need to transition to a low-carbon, sustainable energy system in order to reduce GHG emissions, improve energy security, and promote economic development. As a result, there is an urgent need to diversify the country's energy mix and increase the use of renewable energy sources such as solar PV. These energy sources have been incorporated into the country's energy plans and policies for the next several years.

The 'no-go' alternative also means that the benefits associated with the Proposed Development will not be realised. These include the following:

- **Economic development:** The development of solar PV projects can create jobs in construction, installation, operation, and maintenance. This can provide economic opportunities for local communities and contribute to local economic development. The REIPPPP, for example, has attracted significant private sector investment and created thousands of jobs in the renewable energy sector.
- **Utilisation of solar energy as a clean and renewable energy source:** Solar PV generates electricity from the sun's energy, which is abundant and renewable. Unlike coal-fired power plants, solar PV does not emit GHG's, air pollutants or waste that can harm human health and the environment. It can help to reduce South Africa's dependence on fossil fuels, decrease GHG emissions and contribute to the country's efforts to mitigate its carbon footprint.
- **Energy security:** Solar PV can be deployed in both grid-connected and off-grid settings, making it a versatile energy source. In areas with limited access to electricity, solar PV can provide reliable and affordable energy, improving energy access, improving the quality of life for people, and reducing energy poverty. It can also improve energy security by diversifying the country's energy mix and reducing reliance on imported fossil fuels.

Consequently the 'no-go' alternative is currently not the preferred alternative but will be assessed in more detail during the EIR phase.



## 4. LEGISLATIVE FRAMEWORK

In this chapter, detailed information about the specific legal framework governing the EIA process is provided. **Table 18** outlines the key environmental Acts, associated Regulations, policies, and guidelines that aim to guide project development, and comment is provided on the applicability of this legislation to the Proposed Development and the environmental application process underway. To ensure that the project aligns with sector-specific requirements, an overview of sector-specific environmental legislation that is related to areas such as water resources, heritage preservation, and biodiversity conservation is also provided. International environmental strategies are also discussed.

In addition to environmental legislation, constitutional and administrative legal principles in South Africa are noted and how spatial, land-use and development planning at a local, regional/provincial and national scale have been taken into consideration is discussed.

Compliance with these laws, policies and guidelines demonstrates a commitment from the Applicant to responsible environmental management.



**Table 18: Legislative Framework and Requirements**

Legislation and guidelines used to compile the report	Description	Applicability
<b>International Strategies</b>		
<p><b>United Nations Framework Convention on Climate Change (UNFCCC), 1992</b></p>	<p>The UNFCCC was formed in 1992 due to the global commitment by countries to cooperatively find solutions to limit global average temperature increased. The UNFCCC is a platform for global recognition and emphasising the significance of addressing the harmful effects of climate change.</p> <p>Since 1997, South Africa has been a party to the UNFCCC. As a signatory, South Africa must comply to and participate in meetings and discussions of the UNFCCC. The final outcomes of the 2022 Conference of Parties (COP) 27 focused on the urgency of the climate crisis, and the need to adhere to the 1.5-degree temperature target as per the Paris Agreement. The UNFCCC requests the countries (i.e., signed parties) to adopt policies and mitigation measures to report periodically. South Africa remains committed in stabilising the GHG atmospheric concentration and reports every two years to the UNFCCC.</p>	<p>The Proposed Development is a clean energy solution that contributes to the climate change goals recognised by the UNFCCC.</p>
<p><b>The Kyoto Protocol, 1997</b></p>	<p>The Kyoto Protocol was adopted on 11 December 1997 and was enforced in 2005. It is based on the principles and provisions of the UNFCCC and implements the goals of the UNFCCC by requiring industrialised countries and economies in transition to commit to limiting and minimising GHG emissions in accordance with agreed individual targets. South Africa ratified the Kyoto Protocol in 2002. It also created a meticulous monitoring, review, verification system, and compliance system to guarantee transparency and hold Parties accountable. Under the Protocol, countries' actual emissions</p>	<p>The Proposed Development is defined as a renewable energy technology that will assist in South Africa's overall commitment to limiting and minimising GHG emissions.</p>

must be monitored, and precise records must be kept of the trades carried out.

The Paris Agreement is a legally binding international treaty on climate change. On 12 December 2015, at the COP 21 in Paris, France, it was adopted by 196 Parties. It was enforced on 4 November 2016, bringing all nations together to combat climate change and adapt to its effects. The main goal of the Paris Agreement is to maintain and limit global warming to 1.5°C. To limit global warming to 1.5°C, GHG emissions must peak before 2025 at the latest and decline 43% by 2030.

**The Paris Agreement, 2015**

The Paris Agreement requires each Party to prepare, communicate and maintain successive Nationally Determined Contributions (*NDCs*) that it intends to achieve. NDCs represent efforts by each country to reduce national GHG emissions and adapt to the impacts of climate change. The Paris Agreement requests each country to outline and communicate their post-2020 climate actions. NDCs are submitted every five years by Parties to the UNFCCC secretariat regardless of their respective implementation time frames.

The Proposed Development will aid in the reduction of GHG emissions and contribute to meeting the committed reduction target.

**National Legislation**

**Constitution of the Republic of South Africa, No. 108 of 1996**

The Constitution of the Republic of South Africa is the supreme law of the country and provides the framework for the legal and political system. One of the core principles of the Constitution is the protection of the environment. Section 24 of the Constitution sets out the right to an environment that is not harmful to health or well-being and requires the government to take reasonable measures to ensure that this right is protected. This means that environmental considerations are a crucial component of all government policies and decision-making processes, including environmental practices. This

The Proposed Development complies with Section 24 by ensuring that activities that are likely to have a significant impact on the environment are subject to a rigorous environmental assessment process, and that these potential impacts are assessed, and addressed, and that local communities and stakeholders are involved in the decision-making process.

	<p>constitutional mandate is reflected in various environmental laws and regulations, including the NEMA and the EIA Regulations.</p>	
<p><b>Promotion of Access to Information Act (PAIA), Act No. 2 of 2000</b></p>	<p>The PAIA is to promote transparency, accountability, and good governance in both the public and private sectors. PAIA is closely linked to the EIA Regulations, as it provides a means for members of the public to access information necessary to participate effectively in the EIA process and to hold decision-makers accountable for their decisions. PAIA and the EIA Regulations work together to promote public participation and transparency in environmental decision-making process.</p>	<p>Public Participation will be undertaken in line with the NEMA and EIA requirements throughout the authorisation process to keep registered I&amp;APs notified of the process and any decisions taken by the CA. Please refer to Section 8 for details on the process followed.</p>
<p><b>Promotion of Administrative Justice Act (PAJA), Act No. 3 of 2000</b></p>	<p>The PAJA is to promote administrative justice by providing a framework for the review of administrative action. The PAJA is linked to the EIA Regulations since the EIA process involves a range of administrative actions, i.e. the screening of projects, the preparation of EIA reports, the provision of public notice and consultation, and the granting or refusal of environmental authorisations.</p> <p>PAJA provides a means for individuals or groups who are adversely affected by administrative decisions made in the EIA process to seek a review of those decisions. It also promotes fairness and accountability in the EIA process and helps to ensure that decisions made in the process are lawful, reasonable, and procedurally fair.</p>	<p>Public Participation will be undertaken in line with the NEMA and EIA requirements throughout the authorisation process to keep registered I&amp;APs notified of the process and any decisions taken by the CA. Please refer to <b>Section 8</b> for details on the process followed.</p>
<p><b>National Environmental Management Act (NEMA), Act No. 107 of 1998</b></p>	<p>NEMA is a crucial piece of environmental legislation in South Africa that provides a legal framework for the sustainable management of the country's natural resources and protection of the environment. The Act seeks to ensure that economic development is balanced with the protection of the environment, and that environmental management is</p>	<p>NEMA and its associated EIA Regulations are directly relevant to this application. The Proposed Development triggers listed activities in terms of the EIA Regulations as listed in <b>Table 17</b> therefore requiring a S&amp;EIR process to be undertaken for the Proposed Development.</p>

integrated into all aspects of decision-making, planning, and implementation of projects and activities. NEMA requires that an EIA be conducted for certain activities that may have a significant impact on the environment. The EIA process helps to identify potential environmental impacts and develop measures to avoid or mitigate these impacts.

In South Africa, NEMA requires that EIAs be conducted for certain activities that may have significant impacts on the environment. The legal requirements for EIAs in South Africa are set out in the EIA Regulations, which were developed under the authority of NEMA.

**Environmental Impact Assessment (EIA) Regulations, 2014 (as amended)**

The role of the EIA Regulations is to ensure that proposed projects or activities that are likely to have a significant impact on the environment are subject to a rigorous environmental assessment process i.e. either a Basic Assessment or S&EIR. The EIA process is designed to identify potential environmental impacts and propose measures to avoid, minimize or mitigate those impacts.

The EIA Regulations outline the procedures that must be followed during the EIA process, including requirements for public participation and consultation, the content of the EIA report, and the timeframes for completing the process.

The listed activities triggered by the Proposed Development have been identified in **Table 17**. The Public Participation process is outlined in **Section 8** and the anticipated impacts and mitigation measures have been included under **Section 7** of this report. This report complies with Appendix 2 of GNR 982 of the EIA Regulations.

**National Water Act (NWA), Act No. 36 of 1998**

The NWA provides a comprehensive framework for the management of South Africa's water resources by ensuring that water resources are protected, used, developed, conserved, managed, and controlled in a sustainable and equitable manner for the benefit of all South Africans, in both the present and future.

The DFFE Screening Report determined that the Project Area has a 'very high' sensitivity in terms of the Aquatic Biodiversity theme. As such, an SSV report was undertaken which identified several seasonal streams and artificial wetlands within the Project Area. Additionally, the Project Area is located within a Strategic Water Source Area (SWSA) for groundwater, which prompted a desktop-level Geohydrological investigation. The

It establishes the principles and mechanisms for allocating water rights, managing water resources, and regulating activities that impact on water resources.

Section 21 of the NWA requires water users to register their water use activities with the DWS. The purpose of Section 21 is to provide the DWS with information on water use activities and to ensure that water resources are managed and used in a sustainable and equitable manner. Registration is required for all water use activities, and failure to register may result in penalties under the NWA.

This Act provides a framework for the management and conservation of South Africa's biodiversity in a sustainable manner, while also taking into account the socio-economic needs of the country.

It provides for the protection and conservation of ecosystems, species, and genetic diversity, as well as the sustainable use of biological resources. It also establishes a system for the management of protected areas, including national parks, nature reserves, and wilderness areas.

Section 28 of NEMBA makes provisions for the identification and management of biodiversity hotspots. It requires the Minister of DFFE to identify and declare areas of high biodiversity importance as biodiversity hotspots. These hotspots are areas that are rich in biodiversity and are threatened by human activities.

Section 52 of NEMBA makes provisions for the listing and management of critically endangered ecosystems therefore

findings of both the surface and groundwater investigations are detailed in **Section 6.2.6** of this report. Potential water use activities will include the following:

- Section 21(c): Impeding and diverting the flow of a watercourse.  
The Proposed Development will occur within the regulated areas of watercourses.
- Section 21(i): Altering the bed, banks, characteristics, or course of a watercourse. This activity also includes any development within the regulated area of a wetland.  
The Proposed Development will occur within the regulated areas of watercourses.

The DFFE Screening Report determined that the Project Area has a 'very high' sensitivity in terms of the Terrestrial Biodiversity and Avian themes. As such, an SSV was carried out which determined that the Project Area was not located within a CBA but demarcated as an Ecological Support Area (ESA) 1 in terms of the Limpopo Conservation Plan. In addition, the Project Area is within a hotspot for lizards and snakes. It is therefore essential to predict and evaluate potential impacts of the Proposed Development on local biodiversity. There were no ecosystems present that are listed under GN 689 of 2022. Please refer to **Section 6.2.5** of this report.

**National Environmental Management:  
Biodiversity Act (NEMBA), Act No. 10  
of 2004**

providing legal protection against activities that could harm the ecosystem.

NEMBA seeks to ensure that the management of biodiversity is integrated into all aspects of decision-making, planning, and development in South Africa. It also establishes a range of measures to prevent and control invasive alien species and to regulate activities that may have a negative impact on biodiversity.

The Alien Invasive Species Regulations were enacted under NEMBA. These regulations aim to prevent the introduction and spread of invasive species that have the potential to harm ecosystems, biodiversity, and the economy. These regulations provide a legal framework for the control and management of invasive species, with the ultimate goal of protecting South Africa's natural resources and promoting sustainable development.

**NEMBA  
Alien and Invasive Species  
Regulations, 2020**

It requires that all persons in South Africa, including landowners and land users, take reasonable measures to prevent the introduction and spread of invasive alien species. The regulations establish a system for the identification and listing of invasive alien species that pose a threat to South Africa's biodiversity. It also sets out procedures for the management of invasive alien species, including the removal or destruction of such species and the control of their movement and trade.

Additionally, the regulations provide for the issuing of permits for the introduction or keeping of invasive alien species, subject to certain conditions and requirements. These permits are only issued where it is deemed that the introduction or keeping of

As per the Avifauna SSV, a few alien trees were recorded within the Project Area which will require management/ removal.

Further investigation will be carried out and detailed by Specialists during the EIR phase.

such species is in the national interest and will not result in harm to the environment or human health.

The TOPS Regulations were enacted under NEMBA and aims to protect and conserve species that are threatened with extinction or are of special concern in South Africa.

It establishes a list of species that are deemed to be threatened or protected, including animals, birds, plants, and other organisms. The regulations also set out procedures for the management of these species, including the issuing of permits for their capture, possession, or trade.

The regulations prohibit the hunting, killing, or capturing of any species listed as threatened or protected, except under certain circumstances and with the appropriate permits, and provides for the protection of habitats and ecosystems that are important for the survival of threatened and protected species. This includes the establishment of protected areas, such as national parks, nature reserves, and wilderness areas, where these species can live and thrive in a natural environment. The regulations also establish penalties for non-compliance, including fines and imprisonment.

The NHRA aims to protect the country's heritage resources by providing for the identification, protection, management, and promotion of South Africa's heritage resources in a sustainable manner.

The Act defines heritage resources as "all things and places that are of cultural significance, aesthetic value, historical significance, scientific interest, or archaeological value." This includes buildings, structures, monuments, landscapes,

The Project Area contains several Species of Conservation Concern (SCC) in terms of plants and avifauna that were classified as near threatened, critically endangered or vulnerable. However, the Terrestrial Biodiversity Specialist confirmed during ground-truthing that no unique or highly sensitive terrestrial habitats were observed in terms of floral communities and RDL species and in terms of ideal habitats for faunal RDL and SCC species. Please refer to **Section 6.2.5** of this report. Further investigation will take place during the EIR phase.

The DFFE Screening Report determined that the Project Area has a 'low' sensitivity in terms of the archaeological and cultural heritage theme.

A cultural heritage investigation was undertaken at desktop level, and it has been recommended by the Specialist that a Phase 1 Heritage Impact Assessment be undertaken and submitted to the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Authority

**NEMBA  
Threatened or Protected Species  
(TOPS) Regulations, 2015**

**National Heritage Resources Act  
(NHRA), Act No. 25 of 1999**

artefacts, archaeological remains and human remains older than 60 years.

The NHRA establishes a system for the management of heritage resources, which includes the identification and declaration of heritage sites, the establishment of a national inventory of heritage resources, and the development of management plans for heritage resources.

It provides for the protection of heritage resources, including measures to prevent damage, destruction, or alteration of heritage sites, and the establishment of penalties for non-compliance. It also provides for the preservation of heritage resources through conservation and restoration efforts. Section 35(4) of NHRA requires that an application for a permit be submitted to the relevant heritage resources authority for any activity that may affect an archaeological, palaeontological or meteorite site such as excavation, alteration, demolition, or development.

(PHRA) i.e., Limpopo Provincial Heritage Resources Authority (LIHRA) for comment and decision making during the Draft EIR phase. Please refer to **Section 6.2.8** of this report.

In terms of Section 38 (1) of the NHRA, the following activities are applicable to the Proposed Development:

- Section 38(1)(a): The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length.
- Section 38(1)(c)(i): Any development or other activity which will change the character of a site exceeding 5 000 m<sup>2</sup> in extent.
- Section 38(1)(c)(ii): Any development or other activity which will change the character of a site involving three or more existing erven or subdivisions thereof.

**National Environmental Management:  
Air Quality Act (NEMAQA), Act No. 39  
of 2004**

The purpose of NEMAQA is an act of the South African Parliament that provides for the prevention of air pollution and the promotion of air quality in South Africa.

The purpose of the act is to protect the environment and human health by establishing a framework for managing air quality, including the regulation of emissions from industrial and other sources, the monitoring of air quality, and the implementation of air quality management plans. It sets out various standards and regulations for ambient air quality, emissions, and Atmospheric Emission Licenses (AEL), and provides for the establishment of a National Air Quality Officer

During normal operation of the Proposed Development, it is not anticipated that any pollutants will be emitted. Praxos conducted a detailed analysis of GN 983, which outlines the minimum emission standards associated with listed activities as per Section 21 of NEM:AQA. Based on this analysis, it was determined that none of the listed activities are triggered by the Proposed Development, therefore an AEL will not be required.

There may be emissions generated from the operation of associated infrastructure such as backup generators and inverters. This will be further investigated during the EIR phase.



and provincial air quality officers to oversee the implementation of the act. It also provides for public participation in air quality management, including the right to access information about air quality and the opportunity to participate in the development of air quality management plans.

The National Dust Control Regulations were published in 2013 under the NEMAQA and provides a framework for the control of dust emissions. The purpose of these regulations is to regulate dust emissions from various sources, including industrial and mining activities, construction sites, and unpaved roads. Under these regulations, responsible parties are required to implement dust control measures, monitor dust emissions, and maintain records to demonstrate compliance with the regulations. It provides for enforcement measures and penalties for non-compliance.

**NEMAQA  
National Dust Control Regulations,  
2013**

The regulations also establish emission limits taking into account factors such as the size of the particulate matter, the frequency and duration of the activity, and the distance from sensitive receptors such as residential areas.

For construction activities in residential areas or areas with sensitive receptors, such as hospitals, schools, and old age homes, the regulations specify a maximum allowable dust fall of 600 milligrams per square metre per day (*mg/m<sup>2</sup>/day*). Dust fall refers to the amount of dust that settles on a surface over a given period of time. For construction activities in non-residential areas or areas without sensitive receptors, the regulations specify a maximum allowable dust concentration of 600 milligrams per cubic metre (*mg/m<sup>3</sup>*) for a 24-hour period. If

The Proposed Development is anticipated to generate dust from activities associated with the construction phase, i.e., site preparation, such as grading and excavation, and transportation of materials. However, it is located in a non-residential area away from hospitals, schools, and old age homes.

During the EIR phase, measures for dust control will be detailed for implementation.

the construction activity is expected to last for a longer period, the average dust concentration over a 30-day period must not exceed 240 mg/m<sup>3</sup>.

The responsible party must develop and implement a dust monitoring program to ensure compliance with the applicable emission limits.

NEMWA provides a legal framework for the management of waste in South Africa in a manner that is environmentally sound and sustainable.

The NEMWA aims to promote a hierarchy of waste management, with the prevention of waste as the most preferred option, followed by minimisation, reuse, recycling, recovery, treatment, and, as a last resort, disposal.

The act provides for the licensing and registration of waste management activities in terms of Section 44 and sets out the duties and responsibilities of waste generators, waste transporters, and waste management facilities. It also establishes a system for the classification and characterization of waste, and sets out the procedures for the handling, storage, and disposal of different types of waste.

The purpose of these regulations is to provide a legal framework for the management of different types of waste, from their generation to their disposal or reuse. It aims to promote the sustainable management of waste, reduce its environmental impact, and protect human health and well-being.

Waste will be generated during the construction phase of the Proposed Development which will require adequate management and disposal.

Praxos conducted a detailed analysis of GN 921, which lists waste management activities as per Section 44 of NEMWA. Based on this analysis, it was determined that none of the listed activities are triggered by the Proposed Development, therefore a Waste Management Licence (*WML*) will not be required.

The type of waste that will be associated with the Proposed Development is general waste (domestic – item 2(a)(i)) and potentially general waste containing hazardous chemicals (item 2(b)(ii)) due to hazardous substances such as hydrocarbons and the potential electrolyte storage on site. In accordance with Annexure 1 of these regulations, these waste streams have been listed as waste that do not require classification or assessment.

**National Environmental Management: Waste Act (NEMWA), Act No. 59 of 2008**

**NEMWA Waste Classification and Management Regulations, 2013**

The regulations classify waste into different categories based on their characteristics, such as toxicity, corrosiveness, and flammability. The categories include general waste, hazardous waste, and medical waste, electronic waste, among others. Each category of waste is subject to different management requirements to ensure that it is managed safely and appropriately. It also requires waste generators to ensure that waste is managed in a manner that protects human health and the environment, and that waste is disposed of at authorised facilities. It establishes requirements for waste transport, storage, treatment, and disposal facilities to ensure that they operate safely and comply with environmental and health regulations.

The requirements pertaining to these waste streams will be detailed and included in the EIR phase.

NEMPAA provides a legal framework for the establishment, management, and protection of protected areas in the country. The purpose of the Act is to conserve South Africa's biodiversity and heritage by ensuring the effective management and protection of its protected areas.

**National Environmental Management:  
Protected Areas Act (NEMPAA), No. 57  
of 2003**

Chapter 3 of the Act provides for the declaration of protected areas which includes national parks, nature reserves, wilderness areas, and other areas that have been declared as protected by the government.

The Percy Fyfe Nature Reserve is declared a protected area on the DFFE PAR and is located west of the Project Area. According to the Terrestrial Biodiversity SSV, the Proposed Development does not fall within the protected area but is located 160 m east of the Percy Fyfe Nature Reserve. Appropriate buffers will have to be investigated during the EIR phase.

The Act requires that protected areas be managed in accordance with conservation principles and that management plans be regularly reviewed and updated to ensure that they remain effective.

Any development activity proposed within a protected area must be compatible with the conservation objectives of the

protected area. This means that development activities must not have a significant negative impact on the biodiversity, ecosystems, or cultural heritage of the protected area.

The DFFE relies on the provisions of NEMPAA to form the Protected Areas Register (*PAR*). The PAR is a database of all declared protected areas in South Africa, and it serves as a tool for managing and monitoring the protected area system. Once a protected area has been declared, its details are recorded in the PAR, including its name, location, size, and legal status.

The NPAES is a national-level strategic plan that provides a strategic framework for expanding the protected area network in South Africa.

The NPAES sets out a series of targets and strategies for expanding protected areas in the country, based on ecological and social criteria, and it aims to ensure that South Africa's protected area network is representative of the country's biodiversity and ecosystems. The NPAES is closely aligned with the objectives of NEMPAA, as it seeks to implement the provisions of the Act by expanding and strengthening the protected area network in South Africa. It is also intended to be a dynamic and flexible plan, which can be adapted and revised over time in response to changing conservation priorities and emerging threats to biodiversity.

The Percy Fyfe Nature Reserve located 160 m to the west of the Project Area. The NPAES area of the Limpopo Central Bushveld occurs adjacent to the reserve and expands into the Project Area.

**National Protected Area Expansion Strategy (NPAES), 2010**

**NEMA Procedures for the assessment and minimum criteria for reporting on identified environmental themes when applying for environmental**

The document aims to establish protocols that pertain to the plant and animal species environmental theme, in order to evaluate and determine the minimum reporting criteria that Specialists are to follow when undertaking their assessments. Whenever a protocol is applicable, its guidelines will be given priority over the requirements stated in Appendix 6 of the EIA

The protocol outlined in this document has been referenced in the Specialist Terms of Reference (*ToR*) and has already been applied to the Terrestrial Biodiversity SSV undertaken during the Scoping phase. Similarly, the protocol outlined in this document will be used to conduct the Specialist Studies for the plant and animal species theme during the EIR phase.

**authorisation (terrestrial plant and animal species), 2020**

Regulations. However, if there is no prescribed protocol, the requirements of Appendix 6 of the EIA Regulations will be enforced.

**NEMA  
Procedures for the assessment and minimum criteria for reporting on identified environmental themes when applying for environmental authorisation (agriculture, avifauna, biodiversity, noise, defence, civil aviation), 2020**

The document aims to establish protocols that pertain to the agriculture, avifauna biodiversity, noise, defence, and civil aviation environmental themes, in order to evaluate and determine the minimum reporting criteria that Specialists are to follow when undertaking their assessments. Whenever a protocol is applicable, its guidelines will be given priority over the requirements stated in Appendix 6 of the EIA Regulations. However, if there is no prescribed protocol, the requirements of Appendix 6 of the EIA Regulations will be enforced.

The protocol outlined in this document has been referenced in the Specialist ToR and has already been applied to the agricultural, and avifaunal SSV's undertaken during the Scoping phase. Similarly, the protocol outlined in this document will be used to conduct the Specialist Studies required for these themes during the EIR phase.

**Conservation of Agricultural Resources Act (CARA), No. 43 of 1983**

The act provides a framework for the sustainable use and management of agricultural land, including measures to prevent soil erosion, maintain soil fertility, and conserve water resources.

CARA also addresses the issue of invasive alien plants, which can have negative impacts on agricultural productivity and the environment. The Act provides for the control and eradication of invasive alien plants on agricultural land and requires landowners to take measures to prevent the spread of these plants.

In terms of the Proposed Development, alien tree species were noted within the Project Area. The management of these species will be required and detailed in the EIR phase.

**The Sub-Division of Agricultural Land Act, No. 70 of 1970**

The Act is intended to regulate the subdivision of agricultural land and promote the sustainable use and development of these resources. It seeks to address issues such as soil degradation, land fragmentation, and the conversion of agricultural land for non-agricultural purposes.

The Act requires landowners who wish to change the use of their agricultural land to obtain the necessary approval from

The Project Area is zoned for agricultural purposes and is currently being used for the grazing of livestock. The Proposed Development is industrial in nature and will therefore require a change in land use.

As per the DFFE Screening Report, the agricultural sensitivity of the Project Area was assessed to be of medium sensitivity. An Agricultural Potential SSV was conducted, which determined

the relevant authorities. This approval is granted based on certain conditions, such as the submission of an EIA and a land use plan that outlines how the land will be used and managed sustainably.

It recognises the importance of agricultural land for food security and sustainable development and seeks to prevent the conversion of this land for non-agricultural purposes unless it is justified and sustainable.

The NFA provides for the protection, conservation, and sustainable management of forests in South Africa with the aim of promoting ecological, social, and economic benefits for present and future generations.

The Act establishes a legal framework for the protection of forests and the regulation of activities that may impact forests, such as logging, grazing, and development. It also provides for the establishment of protected areas and the conservation of biodiversity in forests, as well as the promotion of sustainable forest management practices.

**National Forests Act (NFA), Act No. 84 of 1998**

The Act recognizes the important role that forests play in providing ecosystem services, such as clean air and water, carbon sequestration, and biodiversity conservation. It also acknowledges the social and economic benefits that forests provide, including the provision of livelihoods, recreation, and tourism opportunities.

Section 7 regulates the removal of trees and forests through a permit system and requires anyone who wishes to remove trees or conduct forestry operations on forest land to obtain a permit from the relevant authority. The Act also provides for

that the Project Area has moderate soil potential, suitable for livestock and wild game but not for arable crops. Please refer to **Section 6.2.4** of this report.

The Terrestrial Biodiversity SSV recorded a few scattered trees within the Project Area, however none were listed as protected under the NFA. Further investigations will take place during the EIR phase. Please refer to **Section 6.2.5** of this report.

the protection of specific categories of forests, such as protected forests, indigenous forests, and heritage forests. Removal of trees or forestry operations in these forests is subject to additional requirements and restrictions.

**National Building Regulations and Building Standards Act, No. 103 of 1977**

The Act provides for the promotion of uniformity in the law relating to the erection, demolition, and the maintenance of buildings to ensure that all buildings erected in South Africa meet minimum safety, health, and functional requirements. The regulations cover a wide range of building-related matters, including structural safety, fire protection, energy efficiency, ventilation, and sanitation.

Section 13 of the Act also applies to temporary buildings erected during construction such as site offices, storage sheds, worker accommodation, etc. must comply with the relevant building regulations and standards, just like permanent buildings. This includes compliance with the minimum safety, health, and functional requirements set out in the regulations.

The Proposed Development will entail the development of associated infrastructure such as offices, operations and maintenance buildings, workshops, and warehouses. This Act must be considered during the construction phase regarding the erection of infrastructure.

**National Road Traffic Act (NRTA), No. 93 of 1996)**

The Act establishes a framework for the regulation of road traffic, including the registration and licensing of vehicles, the testing and certification of drivers, and the enforcement of traffic laws and regulations. It sets out the responsibilities and obligations of drivers, vehicle owners, and traffic authorities, and provides for the establishment of national and provincial traffic authorities to enforce the provisions of the Act.

The Act also provides for the establishment of a National Road Traffic Regulator, which is responsible for the development and implementation of national road traffic regulations and standards. The Regulator is also responsible for the collection

Solar PV equipment and materials will be transported to and from the Project Area. The Act sets out regulations and standards for the use of public roads and the transportation of goods and equipment to minimize the risk of road accidents or incidents.

A Traffic Impact Assessment will be undertaken to investigate the impact of the Proposed Development on the surrounding road network and to determine safe access points to the Project Area.

and management of road traffic information, and for promoting road safety awareness and education.

**Occupational Health and Safety Act (OHSA), No. 85 of 1993**

The Act establishes a framework for the regulation and management of health and safety in all workplaces, and sets out the responsibilities and obligations of employers, employees, contractors, and other parties in relation to this. It requires employers to provide a safe working environment, to identify and manage workplace hazards and risks, and to provide appropriate training and supervision to employees.

For solar PV projects, this may involve providing training on working with electricity or on the specific hazards associated with solar panel installation and maintenance.

The developer and contractors on site will be required to provide training to staff regarding specific hazards associated with solar panel installation and maintenance.

This will involve conducting a risk assessment of the Proposed Development, identifying potential hazards, and implementing appropriate control measures to eliminate or minimize these hazards.

**Hazardous Substances Act, No 15 of 1973**

The Act regulates the import, export, sale, use, and disposal of hazardous substances. Its main purpose is to ensure that hazardous substances are handled in a way that protects public health and safety, as well as the environment.

The Act requires that hazardous substances be properly labelled and packaged, and that they are only used for their intended purposes and in accordance with the conditions of use specified on their labels. In addition, the Act requires that hazardous substances be stored, handled, and disposed of in a safe and responsible manner. This includes the establishment of safety procedures for the handling and storage of hazardous substances.

Solar panels and associated equipment may contain hazardous substances such as lead, cadmium, and other heavy metals. As a result, developers and operators of these facilities must comply with the requirements of the Act to ensure that these substances are handled in a safe and responsible manner.

**Spatial Planning and Land Use Management Act (SPLUMA), Act No. 16 of 2013**

SPLUMA provides a framework for spatial planning and land use management that is integrated, sustainable, and equitable while also ensuring that the rights and interests of local communities are taken into account. The act also promotes

The Proposed Development will require rezoning of the properties under discussion from agriculture to special-use.

An Agricultural Potential SSV of the Project Area was undertaken. Results indicated that the soil had moderate



transparency, accountability, and public participation in land use and development decision-making processes.

potential, making it suitable for livestock farming and wild game, but not suitable for growing arable crops.

Under SPLUMA, each municipality is required to develop a Spatial Development Framework (*SDF*) that sets out the municipality's spatial vision, goals, and objectives. The SDF provides a basis for the development of land use schemes, which guide the use and development of land in the municipality. Through this integrated approach, SPLUMA aims to promote sustainable and equitable development across South Africa.

**Noise Control Regulations (NCR), 1992**

The regulations provide a framework for managing noise levels and establishing permissible noise limits in various settings, such as industrial and residential areas, as well as public spaces like parks and beaches and outlines the procedures for monitoring and measuring of these noise levels. It sets out the requirements for noise control equipment and specifies the circumstances under which noise-producing equipment may be used. The regulations also establish the procedures for applying for noise exemptions, which may be granted in specific circumstances, such as during construction activities or for emergency situations.

During the construction phase, heavy machinery and equipment used for excavating, grading, and installing solar panels will generate noise that may cause a nuisance. During operation, there may be noise emissions from inverters, transformers, or other equipment.

The guideline for measuring and monitoring noise levels with be investigated further during the EIR phase to sure that noise remains within permissible limits.

**National Energy Act, No. 34 of 2008**

The Act provides a legislative framework for the promotion and regulation of South Africa's energy sector and provides for the development and implementation of a national renewable energy strategy. The purpose of the act is to ensure the provision of sustainable and affordable energy to all South Africans, while promoting economic growth and development. Key objectives include the following:

- Promoting energy efficiency and the conservation of energy resources.

The objectives of the Act are met by the Proposed Development, which involves a renewable energy source aimed at diversifying the national energy mix and ultimately integrating with the national electricity grid. The Applicant intends to participate in the REIPPPP and the development supports the country's plan for energy security by reducing dependence on imported energy sources and providing a reliable source of electricity.

- Encouraging the development and use of renewable energy sources.
- Ensuring the security and diversity of the country's energy supply.
- Promoting investment in the energy sector and facilitate the participation of historically disadvantaged individuals and communities.
- Regulating the energy sector in a manner that is transparent, fair and consistent with national policy objectives.
- Promoting research and development in the energy sector.

Furthermore, the Act provides for the establishment of the Independent Power Producer (*IPP*) programme, which allows private companies to generate and sell electricity to the national grid.

It also establishes the National Energy Regulator of South Africa (*NERSA*), which is responsible for regulating the energy sector and ensuring compliance with the provisions of the act. Including granting licenses for the generation, transmission and distribution of energy, as well as for setting tariffs for the sale of energy to consumers.

**National Energy Regulator Act  
(NERSA), Act No. 40 of 2004**

The Act establishes the NERSA and sets out its powers, duties and functions with the primary purpose of providing for the regulation of the electricity, piped gas and petroleum pipeline industries in South Africa. The Act aims to ensure that the energy sector is developed in a sustainable and efficient manner, with due consideration for social and environmental factors.

The Proposed Development will entail obtaining a license from NERSA and will have to comply with the regulations and standards set out in the Act.

NERSA is responsible for issuing licenses and regulating the activities of electricity generation, transmission, and distribution companies in the country.

One of the key mechanisms introduced by the Act is the Renewable Energy Feed-in Tariff (*REFIT*) system, which incentivises the development of renewable energy projects by guaranteeing a minimum price for the electricity generated.

NERSA's role is to promote the development of a competitive energy market, ensure that prices charged for energy are fair and reasonable, and protect the interests of consumers.

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The purpose of the Act is to establish a regulatory framework for the electricity supply industry, promote transparency, accountability, and fairness in the industry, and provide for the licensing and regulation of persons involved in the generation, transmission, distribution, and trading of electricity.

**Electricity Regulation Act, No. 4 of 2006**

It aims to ensure the efficient, effective, and sustainable development and use of electricity infrastructure in the country, as well as the provision of electricity services to all citizens, while promoting competition and encouraging investment in the sector. The Act also establishes NERSA as the regulatory authority responsible for implementing and enforcing the Act.

It establishes the legal framework within which IPPs can generate and sell electricity to the national grid. IPPs are required to comply with the regulations and licensing

The Proposed Development will entail obtaining a license from NERSA and will have to comply with the regulations and standards set out in the Act.

<p><b>Electricity Regulations on New Generation Capacity, 2009 (as amended)</b></p>	<p>requirements set out in the Act and must obtain licenses from NERSA in order to operate.</p> <p>The purpose of these regulations is to regulate the process of new electricity generation capacity in South Africa. The regulations provide a framework for this including the technical and commercial requirements that must be met by generators. It provides a clear process for developers to follow, including the requirements for obtaining licenses and permits, conducting EIA's, and connection to the grid.</p> <p>The regulations also aim to ensure that new generation capacity is developed in a way that is reliable, efficient, and cost-effective, and that it is consistent with national energy policies and objectives. It establishes standards and requirements for the design, construction, operation, and maintenance of new generation capacity, as well as the safety and environmental standards that must be met.</p>	<p>The Proposed Development will entail obtaining a license from NERSA to be allowed to generate up to 80 MWac and will have to comply with the regulations and standards set out in the Act. The technical standard of the facility complies with those set out by the regulatory authority. Please refer to <b>Section 2.3</b> of this report. In addition, the required EIA process is currently underway.</p>
<p><b>Infrastructure Development Act, No. 23 of 2014</b></p>	<p>The purpose of the Act is to provide a framework for the planning, financing, and implementation of infrastructure projects in South Africa. It aims to promote sustainable development by ensuring that infrastructure projects are implemented in a transparent, efficient, and effective manner, and that they meet the needs of the economy and society.</p> <p>It establishes a National Infrastructure Plan (<i>NIP</i>) and a process for prioritising and selecting projects based on their potential economic and social benefits and includes sectors, such as energy, transportation, water, and telecommunications. The act may also establish an infrastructure development fund to finance the implementation of priority projects.</p>	<p>The Proposed Development is included in the NIP's priority areas established under this Act, specifically the development of renewable energy projects.</p>

Specifically, the act establishes the Presidential Infrastructure Coordinating Commission (*PICC*) and assigns it the responsibility of coordinating and monitoring the implementation of national infrastructure projects. This includes large-scale solar PV projects that contribute to the development of the country's renewable energy sector.

It may include provisions for public-private partnerships, which can provide a means of attracting private sector investment and expertise into infrastructure development. It may also include provisions for environmental and social impact assessments, which are important to ensure that infrastructure projects are developed in a sustainable and responsible manner.

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**Animals Protection Act, No. 71 of 1962**

The purpose of the Act is to protect animals from cruelty and mistreatment. It seeks to prevent the infliction of unnecessary suffering on animals and to promote their welfare and prohibits various forms of animal cruelty, such as beating, kicking, or physically abusing an animal, confining an animal in a way that causes it to suffer, depriving an animal of food, water, or shelter, administering poison or harmful substances to an animal, Transporting animals in a way that causes them to suffer, using animals for fighting or baiting, and performing unnecessary surgical procedures on animals.

It is enforced by the National Council of Societies for the Prevention of Cruelty to Animals (*NSPCA*) and other animal welfare organizations, as well as by law enforcement agencies. It provides for the investigation and prosecution of animal cruelty offenses, and offenders can face fines and imprisonment.

According to the Limpopo Conservation Plan (*LCP*), the Project Area is located in an ESA 1. The Terrestrial Biodiversity SSV indicates that the animal species sensitivity theme is rated as 'medium', and it is anticipated that various native wild animal species will be present within the Project Area. Please see **Section 6.2.5** of this report for further details. As such encounters during the construction and operational phases are anticipated and the required measures are to be investigated further during the EIR phase.

Provincial and Local Legislation and Plans

**PLM Air Quality Management By-law, 2020**

The PLM Air Quality Management By-law aims to provide for air quality management by defining reasonable measures to prevent air pollution, declaring of air quality pollution control zones, prohibiting dark smoke emissions, providing for the installation and operation of fuel burning equipment, providing for the emission of dust, dust fall out monitoring and measures to control dust, and to prohibit emissions that cause a nuisance.

The Proposed Development is anticipated to generate dust from activities associated with the construction phase, i.e., site preparation, such as grading and excavation, and transportation of materials. However, it is located in a non-residential area away from hospitals, schools, and old age homes.

During the EIR phase, measures for dust control will be detailed for implementation.

**Limpopo Conservation Plan (LCP), Version 2 of 2013**

The LCP in South Africa is designed to conserve biodiversity, promote sustainable use of natural resources, and support the social and economic development of the region. The plan was developed through a collaborative effort between government agencies, non-governmental organizations, and local communities.

The LCP seeks to address the environmental challenges facing the Limpopo region, including habitat loss, degradation of ecosystems, and loss of biodiversity. It aims to achieve this by establishing protected areas, restoring degraded ecosystems, and promoting sustainable land-use practices. It identifies CBAs and ESAs in the region, defines their management objective, the compatible and incompatible land uses, and seeks to promote their conservation.

The Project Area falls within an ESA 1 in terms of the LCP.

**Limpopo Environmental Management Act (LEMA), No. 7 of 2003**

The purpose of the LEMA is to provide for the sustainable management of natural resources and the protection of the environment in the Limpopo Province of South Africa. The act aims to ensure that development in the province is sustainable and takes into account the long-term environmental and social impacts of any proposed activities.

The EIA process has been aligned to the objectives of the LEMA to ensure potential impacts arising from the Proposed Development are investigated and appropriate alternatives and mitigation measures are considered.

It provides for the establishment of an environmental management framework for the Limpopo Province, which includes the identification and management of environmental risks and the implementation of measures to mitigate these risks. It also establishes a system of EIAs for proposed developments, to ensure that the potential environmental and social impacts of these developments are identified and addressed before they are approved.

Furthermore, the act establishes the Limpopo Department of Economic Development, Environment and Tourism (*LEDET*) as the primary authority responsible for the implementation of environmental management policies and regulations in the province. LEDET is responsible for the administration of the act, and for ensuring that all developments in the province comply with the environmental management framework and EIAs.

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**Limpopo Green Economy Plan, 2013**

The Limpopo Green Economy Plan is a strategic plan developed by the government of Limpopo Province in South Africa to promote the transition to a low-carbon, resource-efficient, and socially inclusive economy. The plan is focused on identifying and supporting economic sectors that can contribute to sustainable development and job creation, while also promoting environmental sustainability. It sees the Limpopo Province as having an advantage in terms of its geographic position to develop a variety of green industries and economies of scale.

The key objectives of the Limpopo Green Economy Plan include:

The Proposed Development aligns to the key objectives of the Limpopo Green Economy Plan in terms of promoting the use of green energy sources, which contribute towards the province's effort to a reduced carbon footprint and promoting economic growth through job creation.

- Promoting green growth while also promoting environmental sustainability. This includes promoting the development of green sectors, such as renewable energy, waste management, and sustainable agriculture.
- Promoting job creation by promoting the development of green sectors and supporting the growth of existing green businesses.
- Promoting environmental sustainability by reducing the province's carbon footprint and promoting the conservation and sustainable use of natural resources.
- Promoting social inclusion by ensuring that the benefits of green growth are shared equitably and by supporting the development of green businesses owned by historically disadvantaged individuals and communities.

The LDP is a strategic plan developed by the government of the Limpopo Province in South Africa and aims to guide the development of the province over a 15-year period, from 2015 to 2030, with the goal of promoting economic growth, social development, and environmental sustainability.

**Limpopo Development Plan (LDP)  
2020 -2025**

The key objectives of the Limpopo Development Plan include promoting:

- Economic growth by identifying and supporting key economic sectors, such as mining, agriculture, tourism, and manufacturing. The plan also seeks to promote trade and investment in the province and to develop infrastructure, such as roads, rail, and ICT networks, to support economic growth.
- Social development by promoting access to education, healthcare, and social services. The plan also seeks to address issues of poverty, inequality, and unemployment,

The Proposed Development aligns to the key objectives of the LDP in terms of promoting the use of renewable energy sources, contributing to the country's effort toward a reduced carbon footprint and promoting economic growth through job creation.



particularly among disadvantaged communities in rural areas.

- Environmental sustainability by promoting the conservation and sustainable use of natural resources, such as water, land, and biodiversity. The plan also seeks to mitigate the impact of climate change on the province and to promote the use of renewable energy sources.

The LEIP 2015-2020 is a strategic plan developed by the LEDET in South Africa to address environmental challenges and promote sustainable development in the province. The plan provides a framework for implementing environmental policies and programs in Limpopo and is focused on achieving sustainable development outcomes that promote social, economic, and environmental well-being.

The key objectives of the LEIP 2015-2020 include:

- Environmental management and governance by promoting effective implementation of environmental laws, policies, and regulations.
- Biodiversity conservation: The plan aims to promote the conservation and sustainable use of biodiversity in Limpopo by identifying and protecting priority ecosystems and species.
- Climate change adaptation and mitigation: The plan aims to promote climate change adaptation and mitigation in Limpopo by identifying and implementing measures to reduce GHG emissions and build resilience to the impacts of climate change.
- Waste management: The plan aims to promote sustainable waste management practices in Limpopo by promoting waste reduction, recycling, and responsible disposal.

The Proposed Development aligns to the objectives of the LEIP by generating electricity from a renewable energy source, which can help to reduce GHG emissions and decrease reliance on fossil fuels and their associated emissions. Currently, an EIA is being conducted to assess the impacts of the Proposed Development on biodiversity and other relevant factors. The aim is to develop appropriate mitigation measures that are aligned with the objective of achieving sustainable development.

**Limpopo Environmental Implementation Plan (LEIP), 2015-2020**

- Environmental education and awareness: The plan aims to promote environmental education and awareness in Limpopo by raising public awareness of environmental issues and promoting environmental education in schools and communities.

**Limpopo Spatial Development Framework (LSDF), 2022**

The purpose of the LSDF is to provide a long-term spatial vision and framework for the province's development, which includes identifying priority areas for investment and development, and guiding land use and infrastructure planning. The LSDF plays both a directive and coordinating role in planning and implementation in the province. It sets the strategic direction for sector planning and municipal planning in the province. The LSDF provides a strategic link between national and municipal spatial planning, contextualising the National Spatial Development Framework (NSDF) for the realities, aspirations and challenges of Limpopo. To facilitating alignment of planning and implementation, it is a tool to guide the spatial targeting of investment and spending in the province.

The relevance of the LSDF towards renewable energy projects lies in its ability to guide the spatial planning and development of these projects in a sustainable manner. The SDF can identify suitable areas for renewable energy development, taking into account factors such as land use, biodiversity, and infrastructure. By doing so, the LSDF can help to ensure that renewable energy projects are developed in a way that minimizes negative environmental impacts, promotes social equity, and contributes to economic growth.

The Proposed Development aligns to the objectives of the SDF by promoting the transition to a low-carbon economy and support the achievement of national and international climate change objectives.

**Capricorn District Municipality Integrated Development Plan (IDP), 2022-2023**

The CDM IDP is a strategic planning tool that sets out the development priorities and objectives for the district over a five-year period. The purpose of the IDP is to provide a

The Proposed Development aligns to the vision of the IDP in terms of utilising renewable energy to meet the demand of the area.

comprehensive and coordinated plan for all the services and functions that the municipality provides, including water and sanitation, roads, electricity, housing, waste management, and social services and is an important tool for ensuring that the municipality's resources are used in a coordinated and effective manner to meet the needs of all its residents.

A key development priority set out in the CDM IDP is for sustainable, alternative and green energy provision in the municipality. The IDP recognises the need to provide renewable energy sources to the people of CDM.

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**Polokwane Local Municipality IDP,  
2022-2023**

The Polokwane IDP is a strategic planning tool that sets out the development priorities and objectives for the municipality over a five-year period. The purpose of the IDP is to provide a comprehensive and coordinated plans for all the services and functions of the municipality. The Polokwane IDP is required to align with the provincial and national development plans and strategies, including the Energy Master Plan of Limpopo. Therefore, the Polokwane IDP incorporates the energy objectives and targets set out in the Limpopo Energy Master Plan into its own strategic plan for the municipality. New infrastructure is planned and implemented by means of the Energy Master Plan.

The Energy Master Plan of Limpopo is a strategic plan that outlines the province's vision and objectives for the energy sector, as well as specific goals and targets for achieving those objectives. It focuses on developing a sustainable and reliable energy system that meets the needs of all Limpopo's residents, while also promoting economic growth, job creation, and environmental sustainability. It identifies the provinces energy

The Proposed Development aligns to the plans and vision of the IDP in terms of utilising renewable energy to meet the demand of the area whilst contributing towards job creation and reducing its carbon footprint.

resources and potential, including renewable energy sources such as solar, wind, and biomass, as well as traditional sources such as coal. The plan sets out policies and strategies for promoting the development of these resources, including incentives for private sector investment, capacity building, and research and development.

The IDP recognises that transportation, industry, commerce, and the residential sector are the greatest contributors to GHG emissions, due to their high demand of energy which is supplied from non-renewable sources and acknowledges the need to reduce these emissions as far as possible. The energy sector is responsible for about 89% of the national emissions of CO<sub>2</sub>, mainly from energy industries (57%).

The LEGDP provides a framework for the provincial government to prioritise strategies in the National Medium-Term Strategic Framework (MTSF). It highlights the correlation between growth and development and meeting service delivery targets (i.e., provision of electricity).

**Limpopo Employment Growth and Development Plan (LEGDP), 2009-2014**

One of the main objectives of the LEGDP is to ensure more inclusive economic growth, decent employment, and sustainable livelihoods. Another strategic priority of the LEGDP, is the management and utilisation of sustainable resources. The LEGDP recognises the impacts of climate change, biodiversity loss and diminishing water resources. Therefore, it emphasises on solutions such as diversifying the energy mix by focusing on renewable energy technologies, supporting energy efficiency, and implementing a zero-tolerance method to illegal and unsustainable exploitation of resources etc.

The Proposed Development reinforces the strategic priorities set out in the LEGDP.

**Polokwane Economic Growth and Development Plan, 2030**

The Polokwane Economic Growth and Development Plan is essentially a plan that is based on new objectives and strategic

The Proposed Development is identified as an alternative green energy technology and therefore supports the initiative of the

interventions for the city. It is seen as a new developmental path for economic growth that focuses on the green economy and energy initiatives.

green economy and commits to the movement towards a smart city.

The plan reflects on the current challenge faced by Polokwane, in which the city is struggling to keep up with the service delivery demands caused by the rapid increase in population. The plan states that only 1% of electricity is generated by solar energy sources. Due to Polokwane’s favourable geographical locality this is regarded as a major under-utilisation of natural resources. In 2013, Polokwane’s political leadership agreed that Polokwane needs to become a ‘Smart City’ by 2030. The Smart City concept incorporates a variety of new and innovative technologically driven solutions to global mega trends affecting the way a city is governed and planned for. One of the solutions to achieving a Smart City is to implement alternative green energy technologies and reduce the carbon footprint.

**Polokwane Green Goal Energy Strategy Update and Implementation Plan, 2016**

The 2016 Polokwane Green Goal Energy Strategy Update and Implementation Plan recognises that energy services are critical for welfare and development, however, admit that energy systems also present several issues and challenges that need to be addressed. The plan aligns with Goal 7 of the United Nations Development Programme (*UNDP*) Sustainable Development Goals (*SDGs*) which seeks to ensure access to affordable, reliable, sustainable, and modern energy for all. As the municipality carries the mandate to ensure that all citizens have access to clean, affordable and safe energy services.

The Proposed Development is an energy efficient solution that will contribute towards achieving Polokwane’s sustainable green energy and climate mitigation goals, whilst meeting energy demands.

The main purpose of this plan is to allow the municipality to build and develop a city that is energy efficient and supports

various sustainable energy solutions. Thus, contributing towards a more efficient economy in support of the country's commitment to reducing the carbon footprint.

Currently, energy demand in Polokwane is met with three major fossil fuels that contribute to global warming, i.e., electricity, petrol, and diesel. The plan emphasises the need for an alternative energy future, whereby renewable energy technologies will aid in reducing the rising energy demand, carbon emissions and will cost less. Therefore, this Green Goal energy future underpins the Polokwane mission and would support a stronger economy and creates a greater resilience amongst poor households. The plan also aims to boost economic opportunities by ensuring the municipality promotes the efficient use of energy in all sectors (i.e., residential, commercial, agricultural, transport and industrial).

**Guidelines, Policies and Plans**

The purpose of this guideline is to provide a framework for identifying, assessing, and comparing alternative options for proposed developments that may have significant environmental impacts.

**DEA: Guideline on Alternatives, 2010**

The guideline aims to promote the consideration of alternative approaches to development that may have a lower impact on the environment or be more sustainable, and to ensure that environmental impacts are considered in the decision-making process for proposed developments.

The Scoping and EIR process will consider the most feasible alternatives for the Proposed Development. Please refer to **Section 3** of this report.

This guideline must be read in conjunction with NEMA, EIA Regulations, and Specific Environmental Management Acts

(SEMAS) and is not intended to be a substitute to the provisions of such Acts.

**DEA: Public Participation Guideline in terms of NEMA EIA Regulations, 2017**

The purpose of this guideline is to provide guidance on the public participation process required under the NEMA and EIA Regulations. It aims to ensure that members of the public and other stakeholders have an opportunity to participate in the EIA process and to provide their input and feedback on proposed developments that may have significant environmental impacts.

Public Participation Process (PPP) for the Proposed Development will be conducted in accordance with the requirements set forth in the DEA Public Participation Guideline during the Scoping and EIR phase. Please refer to **Section 8** of this report.

**DEA: Guideline on the Need and Desirability, 2017**

The guideline provides a framework for assessing the need and desirability of proposed developments, taking into account factors such as economic, social, and environmental considerations. It also aims to ensure that proposed developments are consistent with relevant policies, plans, and regulations, and that they contribute to the overall sustainable development objectives of South Africa.

The Proposed Development complies with the requirements of the Guideline on Need and Desirability, published in terms of Section 24J of the NEMA in 2014, and second version in 2017. Please refer to **Section 5** of this report.

**DEA: EIA Guideline for Renewable Energy Projects, 2015**

The guideline provides a framework for assessing the potential environmental impacts of renewable energy projects, including solar PV, wind, hydroelectric, and biomass projects. It provides guidance on the scoping of the EIA, the identification of potential impacts, the assessment of the significance of impacts, and the development of mitigation measures to minimise or avoid negative impacts.

The Scoping and EIR process for the Proposed Development has taken into account the requirements of this guideline.

It aims to ensure that renewable energy projects are developed in a manner that is consistent with the principles of sustainable development, and that they contribute to the overall well-being of the country and its citizens. It also seeks to promote the development of renewable energy projects that are economically viable and socially acceptable, while minimizing negative environmental impacts.

**National Development Plan (NDP),  
2012**

The NDP is a long-term plan for South Africa that was adopted by the government in 2012. It provides a vision for the country's development by identifying key challenges, opportunities, and priorities for the next 20 years. The NDP is aimed at addressing the country's socio-economic challenges and achieving a better life for all South Africans.

The NDP focuses on a number of priority areas, including:

- **Economy and Employment:** It aims to address high unemployment and inequality by creating an inclusive and growing economy that provides decent work and sustainable livelihoods for all South Africans.
- **Education and Skills Development:** It aims to improve the quality of education and skills development in the country to ensure that all South Africans have the skills and knowledge needed to participate fully in the economy and society.
- **Health:** It aims to ensure that all South Africans have access to quality healthcare services and that the country's healthcare system is sustainable and effective.
- **Infrastructure Development:** By improving the quality and availability of infrastructure, including transport, energy, water, and ICT.
- **Rural Development:** It aims to promote inclusive and sustainable rural development by addressing poverty, inequality, and underdevelopment in rural areas.

The NDP recognizes the important role that renewable energy, can play in achieving the country's socio-economic goals and identifies energy as a critical enabler of economic growth and development, highlighting the need for a diverse energy mix that includes renewable energy sources. The plan sets out a

The Proposed Development contributes to the vision of the NDP and proposes a generation capacity of up to 80 MWac from a renewable energy source. It will also contribute to other priority areas such as the economy and employment, and as skills development.



goal of generating 20 GW of renewable energy by 2030, which includes a mix of solar, wind, and other renewable energy sources.

It recommends the implementation of policies and programs that promote investment in renewable energy infrastructure. This includes the establishment of incentives and regulations to encourage private sector investment in renewable energy projects, as well as the development of financing mechanisms and technical assistance to support the deployment of solar PV facilities.

It emphasizes the need for skills development and training programs to support the growth of the renewable energy industry and ensure that South Africans have the skills and knowledge needed to participate in this sector. This includes initiatives to support research and development of new renewable energy technologies and to build local capacity for the manufacturing and installation of solar PV systems.

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**National Infrastructure Plan 2050  
(NIP), 2022**

The NIP of South Africa is a long-term infrastructure development plan that was launched as part of the country's NDP. The plan is aimed at addressing the country's infrastructure backlog and promoting economic growth and development through the development of key infrastructure projects. The NIP identifies a number of priority areas for infrastructure development, including energy and sets out a number of goals and targets for development.

The plan identifies the development of renewable energy infrastructure (especially solar and wind) as a key objective in the country's energy sector and outlines a number of specific

The Proposed Development would contribute to the goal of the NIP by helping to achieve the plan's objective of expanding access to electricity, promoting economic growth, development, and sustainability. It helps to increase the country's energy generation capacity by proposing a generation capacity of up to 80 MWac from a renewable energy source (solar), reduce its reliance on fossil fuels, and contribute to the development of a more sustainable and low-carbon energy system.

targets for renewable energy development. By 2050, energy demand is projected to double. Installed generation capacity will therefore need to expand, from 53 GW in 2018 to between 133 and 174 GW by 2050, depending on energy demand at that time. By 2030, at least 25 GW will have to be added to installed capacity with the requisite supportive transmission and distribution network infrastructure.

The IEP is a long-term energy planning document that sets out the country's energy policy framework and provides a roadmap for the development of its energy sector over the next few decades. The primary purpose of the IEP is to provide a coherent and coordinated approach to energy planning that takes into account the country's economic, social, and environmental priorities.

The IEP aims to achieve the following goals:

- Ensure a secure and reliable supply of energy for the country to meet its growing energy needs. This includes reducing dependence on imported energy sources, diversifying the country's energy mix, and promoting energy efficiency and conservation measures.
- Promote economic growth and development by providing a stable and predictable energy policy framework that encourages investment in the energy sector. It also seeks to promote the development of local industries and create employment opportunities through the development of renewable energy projects.
- Reduce the country's carbon footprint: The IEP recognizes the need to address climate change and reduce the country's carbon footprint. It sets out a roadmap for the transition to a low-carbon economy by promoting the development of renewable energy sources, increasing

The Proposed Development is in line with the objectives of the IEP, as it has been designed to generate up to 80 MWac of renewable energy, thereby helping to reduce the country's carbon footprint.

### Integrated Energy Plan (IEP)

energy efficiency, and promoting the use of cleaner technologies.

Ensure affordable energy prices for all South Africans by promoting energy efficiency and conservation, increasing the use of renewable energy sources, and promoting competition in the energy sector.

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The IRP 2019 is a comprehensive energy plan developed by the South African government in response to the Integrated Energy Plan to guide the country's electricity generation mix over the next decade. It provides a framework for the development of new electricity generation capacity, including renewable energy sources, as well as the decommissioning of older and less efficient power plants.

#### **Integrated Resources Plan (IRP), 2019**

The IRP 2019 replaces the previous version of the plan, which was published in 2011, and provides a more detailed and updated roadmap for the country's energy sector. The plan outlines the government's energy objectives, including reducing the country's dependence on coal-fired power plants, increasing the use of renewable energy, and promoting energy efficiency and demand-side management.

The plan includes a mix of energy sources, including solar PV, wind, hydroelectric, gas, and coal, with a focus on increasing the contribution of renewable energy to the country's energy mix.

The plan also includes targets for the procurement of renewable energy to be added to the grid by 2030. The IRP 2019 aims to create a more diversified and sustainable energy sector

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The Proposed Development responds to the IRP 2019 as it entails the development of a solar PV facility which is identified as a key technology for the country's future energy mix.

in South Africa, while also promoting economic growth and job creation.

Developers of new solar PV facilities in South Africa will need to follow the procurement process outlined in the IRP 2019 to secure a Power Purchase Agreement (PPA) with the government. The PPA sets out the terms under which the developer will sell the electricity generated by the solar PV facility to the government.

The REIPPPP is a program established by the South African government in response to the IEP to promote the development of renewable energy projects in the country.

**Renewable Energy Independent  
Power Producer Procurement  
Program (REIPPPP)**

The program was established to encourage private sector investment in the renewable energy sector. Under the REIPPPP, private sector developers are invited to bid for the development of renewable energy projects, including solar PV, with the aim of increasing the country's renewable energy capacity.

The intention of the Applicant is to participate in the REIPPPP rounds and contribute towards achieving the goals of the program by proposing the development of the solar PV facility.

**White Paper on Energy Policy, 1998**

The White Paper on Energy Policy of 1998, also known as the Energy White Paper, was a significant policy document released by the South African government in 1998. Its purpose was to provide a framework for guiding the country's energy sector, including various aspects such as energy supply, consumption, and planning.

The white paper set a target of achieving 10,000 GWh of renewable energy generation by 2013. This goal aimed to encourage the development and utilisation of renewable energy sources such as solar, wind, hydro, and biomass.

In terms of renewable developments, the policy recognised the importance of diversifying South Africa's energy mix and reducing dependence on fossil fuels. It acknowledged the potential of renewable energy sources in contributing to a sustainable and environmentally friendly energy sector. The Proposed Development entails the development of a solar PV facility for electricity generation which will eventually feed into the national grid at a later stage and through a separate EIA process. The intention of the Applicant is also to participate in the REIPPPP rounds.

The policy promoted the concept of Integrated Resource Planning as a tool for evaluating and selecting energy supply options, including renewables. It recommended that the IRP process should incorporate a long-term perspective on renewable energy development.

It's important to note that this policy laid the foundation for subsequent energy policies and frameworks in South Africa. Over the years, the government has introduced additional policies and programs to promote renewable energy development, such as the REIPPPP. The REIPPPP has been instrumental in attracting private sector investments and driving the deployment of renewable energy projects in the country.

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**White Paper on Renewable Energy,  
2003**

The White Paper on Renewable Energy published by the Department of Minerals and Energy (*DMRE*) in November 2003, and aimed to establish a framework and guidelines for the development and utilisation of renewable energy sources in South Africa. The document outlined the ten (10) year targets for the role of renewable energy technologies in South Africa's diverse energy mix and securing cleaner energy. It identified specific renewable energy technologies for development and deployment. These included wind energy, solar energy (both photovoltaic and solar thermal), biomass energy, biogas, small-scale hydropower, and landfill gas.

The policy set a target of deriving 10,000 GWh or 10% of South Africa's total energy consumption from renewable energy sources by 2013. This target aimed to promote the integration of renewable energy into the national energy mix.

The Proposed Development entails the development of a solar PV facility for electricity generation which will eventually feed into the national grid at a later stage and through a separate EIA process. It also provides the opportunity for securing additional energy from a 'clean source'.

The intention of the Applicant is to participate in the DMRE REIPPPP rounds.

	<p>It also laid the groundwork for subsequent renewable energy policies and programs in South Africa, such as the REIPPPP.</p>	
<p><b>National Energy Efficiency Strategy, 2016</b></p>	<p>The White Paper on Energy Policy (1998) was used as a basis to create this strategy document and influences methods towards improving energy usage, by focussing on energy intensity and differentiating economic growth from energy demand. The Draft Post-2015 National Energy Efficiency Strategy (2016) aims to build further on energy efficiency improvements, through a combination of economic and financial incentives, a vigorous legal and regulatory framework, and supportive facilitating measures.</p> <p>The National Energy Efficiency Strategy’s vision is to ultimately support energy efficiency in a manner that is socially inclusive and environmentally sustainable whilst achieving economic growth (i.e., increasing job creation and adding to technological innovation). It prioritises the goals set out in the NDP 2030 and South Africa’s Intended Nationally Determined Contribution (INDC) under the UN Framework on Climate Change.</p>	<p>The introduction and continuous growth of the green energy sector within South Africa supports the vision and aims of the National Energy Efficiency Strategy. One of the measures mentioned towards promoting renewable generation is the REIPPPP. The Proposed Development is part of the REIPPPP and hence is in support of the National Energy Efficiency Strategy.</p>
<p><b>National Climate Change Response Policy White Paper (NCCRP), 2011</b></p>	<p>The White Paper on the NCCRP is a policy document released by the South African government in 2011. It provides a framework for addressing climate change issues and guiding the country’s response to climate change challenges. While the NCCRP does not specifically focus on renewable energy developments, it does have implications for renewable energy as part of the broader efforts to mitigate GHG emissions and transition to a low-carbon economy.</p>	<p>The Proposed Development entails the construction of a solar PV facility which is regarded as a source of ‘clean energy’ and will assist in South Africa’s efforts towards reducing its carbon footprint.</p>

## 5. NEED AND DESIRABILITY

### 5.1 PROJECT MOTIVATION

As per the 2008 Local Government Budgets and Expenditure Review, electricity is an imperative component of modern life and essential to the South African economy. People use electricity for a variety of uses such as lighting, heating, cooling, food preparation and refrigeration and for operating appliances, computers, electronics, machinery, and public transportation systems. According to the South African Energy Sector Report 2021, electricity is vital for societies to function effectively in multiple sectors (i.e., residential, commercial, industrial and transportation).

According to the IRP 2019, electricity has transformed how people live and survive, as it provides a better quality of life for those that have access to it. Electricity fuels a broad range of devices that can be used for food storage and preparation, heated water, faster communication, and entertainment. Apart from convenience, it allows people to achieve a healthier, happier, and safer lifestyle. The proposed development is a large scale solar PV facility to generate renewable electricity and is in direct response to the REIPPPP, as established by the Department of Energy under the IRP.

As per the World Health Organisation (*WHO*) electricity is extremely crucial for medical care. Healthcare facilities such as hospitals/clinics heavily rely on consistent electricity. Medical equipment, electronic health records, lighting, security systems, and air conditioning all need energy. Hence, power outages are tremendously dangerous for healthcare facilities because they are unable to suspend their operations, as it is life threatening to patients. When outages occur, hospitals and nursing homes rely on generators or often have to evacuate, which comes with its own risks.

According to the International Labour Organisation (*ILO*), the electric power industry is a huge job creator. It uses a lot of skilled workers to maintain and repair the electrical grid. That incorporates checking and repairing power lines, getting power back after a severe weather event, and wiring homes and businesses. The green energy sector is also creating lots of job opportunities.

The National Energy Efficiency Campaign indicates that South Africa is one of the world's least energy efficient nations. South Africa uses approximately 40% of Africa's electricity and are the 12<sup>th</sup> highest emitter of GHGs in the world (2022). The heavy dependence on energy has led to the situation where the reserve margin is unsustainably low, and the reliability of the electricity supply is under threat. Therefore, South Africa's energy habits have adverse effects on the economy, environment, and the health of its citizens.

According to the annual statistics on power generation in South Africa for 2022, by the Council for Scientific and Industrial Research (*CSIR*), the total system demand was similar to 2021, but still 5.2 TWh (2.2%) less than the pre-lockdown levels of 2019. Coal continues to dominate the South African Energy mix, by contributing 80.1% of the total system load. Renewable energy technologies (i.e., wind, solar PV and Concentrating Solar-Thermal Power [*CSP*]) contributed towards an increase in 2022 to a total of 6.2 GW installed capacity and provided 7.3% of the total energy mix (13.7% including hydro). Nuclear energy contributed 4.6%, whereas the remaining 1.6% was attributed to diesel.

It was the first year that solar (PV and CSP) generation output decreased to 6.2 TWh from achieving 6.8 TWh in 2021. In 2022, 16 TWh of wind, solar PV & CSP electricity was produced in South Africa. Indicating a 6% increase from the previous year (15.1 TWh). This escalation can be attributed to the increased generation output by wind energy (9.7 TWh).

South Africa's electricity crisis has worsened as power cuts (i.e., loadshedding), which began in 2007, intensified in 2022. The percentage availability of South Africa's total installed capacity of 53.7 GW at the end of 2021 plunged to below 60% in October 2022 as Eskom's coal-fired power stations continue to break down, resulting in continuous power cuts to prevent the electricity grid from failing.

The Eskom fleet Energy Availability Factor (EAF) continued its decreasing trend in 2022, with an average EAF of 58.1%, compared to the EAF of 61.7% for 2021 and 65% for 2020. This is largely due to the increase of unplanned outages (detailed by the unplanned capacity loss factor) experienced by Eskom. In 2022, loadshedding occurred for 3 773 hours (i.e., 43% of the hours) with an upper limit of 11 529 GWh relative to actual energy shed of 8 301 GWh.

The year 2022 surpassed 2021 as the most intensive load shedding year yet, occurring most often in the latter half of the year, which encompassed over 80% of the annual total. December 2022 was recorded as the highest loadshedding month ever. The month alone experienced more loadshedding than in any previous year. This is the first year that a majority of the load shedding was not Stage 2, having been predominantly Stage 4. Stage 6 load shedding for 2022 has far bested that of which was experienced in 2019, with the situation not improving on 2023.

Once fully operational, the Proposed Development is estimated to generate an output of 120 MW. The intention is for the generated electricity from the Proposed Development to be supplied to the national grid, following necessary approvals.

## 5.2 LOCATION

In terms of the need and desirability of the location, several factors were taken into consideration. A Strategic Environmental Assessment (SEA) for Electricity Grid Infrastructure (EGI) in South Africa was undertaken and recognised five (5) Strategic Transmission Corridors that are of strategic importance for supporting large scale electricity transmission and distribution infrastructure in terms of Strategic Integrated Project 10: Electricity Transmission and Distribution. The Project Area is situated within the International Strategic Transmission Corridor which confirms that the Proposed Development is well located on a regional and national scale.

Data obtained from Solar Geographic Information System (GIS) indicate that the solar resource in the project area is high having Global Horizontal Irradiation (GHI) values ranging between 2197 and 2216 kilowatt hours per square metre (kWh/m<sup>2</sup>) making it very suitable for PV. In terms of the road network, the Project Area is accessible via a public road, which connects with the R102 and is in close proximity to the N1.

The property is of a suitable size to provide a viable solar PV/BESS facility, while ensuring that environmental sensitivities present on the property are not compromised. The location of the Project Area within a rural area is preferable to an urban area where dense development would shade the Proposed Development, and where there would be several neighbours in proximity that could be impacted. The proposed land-use is considered appropriate, given that the developable area of the Project Area was selected based on it being unsuitable for productive soil cultivation and crop harvesting, therefore the suggested industrial land-use is deemed suitable. Despite not being entirely flat, the topography and slope of the Project Area lends itself to the Proposed Development. The landowner has also provided consent for the Proposed Development.

In terms of existing power transmission infrastructure, there are two 132 kV lines and an Eskom substation adjacent to the Project Area which provides good opportunity for connection to the national electricity grid in future.



### 5.3 SOCIAL AND ECONOMIC DEVELOPMENT

With regards to potential employment opportunities, approximately 150 construction staff are expected at peak of construction. Skills split would be in line with applicable procurement requirements but would be roughly 60% low-skilled, 25% semi-skilled and 15% skilled. Subsequently, approximately 8 operational staff would be required to maintain and manage the PV facility. Skills split would be in line with applicable procurement requirements but would be roughly 70% low skilled, 25% semi-skilled and 5% skilled. It is intended that local labour would be sourced as far as possible and would be aligned with applicable procurement requirements.

### 5.4 INTERNATIONAL STRATEGIES

The United Nations Framework Convention on Climate Change (*UNFCCC*), the Kyoto Protocol and the Paris Agreement (explained in further detail in Section 5 above) are international strategies that form part of the needs and desirability of the Proposed Development. The Proposed Development is a renewable energy technology (i.e., a clean energy solution) that contributes to the climate change goals recognised by the UNFCCC, will assist in South Africa's overall commitment to limiting and minimising GHG emissions and contribute to meeting the committed reduction target.

### 5.5 NATIONAL STRATEGIES

The supply of electricity consists of three phases (i.e., generation, transmission, and distribution). National government is responsible for the generation of electricity and its transmission nationwide. According to the 2011 Local Government Budgets and Expenditure Review published by the National Treasury, the state-owned electricity company, Eskom, is responsible for over 95 per cent of electricity generation and all transmission in the country. However, Eskom is currently unable to supply enough electricity to meet the current demand, yet alone prospective demand projections.

The Proposed Development, which is identified as a type of renewable energy, is in support of Section 24 of the Constitution of South Africa, as it aims to generate energy from natural resources (i.e., sunlight) that produces no GHG emissions from fossil fuels and reduces some types of air pollution. Thus, creating an environment that is not harmful and additionally, protects the environment in a sustainable manner.

The Proposed Development also aligns with several other national strategies (discussed in detail in **Section 4**), such as the White Paper on Energy Policy (1998), White Paper on Renewable Energy (2013), National Energy Efficiency Strategy (2016), National Integrated Energy Plan (*IEP*) and the National Climate Change Response Policy White Paper (*NCCRP*) amongst others.

According to the Integrated Resources Plan (*IRP*) 2019, South Africa's power system consists of a variety of energy generation sources, of which a large contribution is produced by coal (38 GW). Whereas 3.8 GW is produced from diesel, 3.7 GW from renewable energy, 2.7 GW from pumped storage, 1.8 GW from nuclear and 1.7 GW from hydro. The IRP aims to achieve and prioritise energy security within the country by developing suitable energy generation capacity to match electricity demands, whilst considering both the current low-growth economic environment and eventually when the future economy changes and improves to a projected 4% growth per annum.

In terms of renewable energy, the IRP 2019 emphasises that Solar PV, Wind and CSP allow for a diversification of the energy mix, to generate and distribute electricity, and provide off-grid energy whilst minimising air emissions. Renewable energy sources also align with government objectives by creating new industries, employment opportunities and localisation of the full lifecycle of a product/service. The Proposed Development

aims to support the overall aim and proposed goals set out in the IRP 2019, by adding to the diverse energy mix and providing off-grid renewable energy.

The REIPPPP is one of South African government's crucial interventions to improve power generation capacity by securing investment via the private sector and therefore diversifying the energy mix as expressed in the White Paper on Energy Policy (1998). The REIPPPP has also been created to support other national developmental objectives such as job creation, social upliftment, and economic transformation. The REIPPPP contributed to providing additional energy into the current electricity system through private sector investment in solar PV technologies, amongst others.

The Proposed Development will aim to form part of the REIPPPP and therefore will be in support of the goals set out in the National Development Plan (*NDP*) and IRP towards improving power generation capacity whilst achieving low carbon emissions.

## 5.6 PROVINCIAL STRATEGIES

According to the 2018/19 Limpopo Socio-Economic Review and Outlook (SERO) report published by Limpopo Provincial Treasury, the Limpopo province is faced with the three major challenges: unemployment, inequality, and poverty. The Limpopo SERO recognises the need for creating higher economic growth in order to address the challenges. A higher economic growth rate will result in more opportunities for job creation and thus, will aid in alleviating poverty and inequality. The Limpopo SERO states that the province is adversely affected by low industrial activity (i.e., an extractive economy). However, it is highlighted that the province is well endowed with substantial natural resources such as the land mass, sun and other minerals to allow for renewable energy exploration. The report suggests that renewable energy technologies can be a niche for Limpopo to capitalise on by aligning the current skills profile with market needs.

The provincial strategies that form part of the needs and desirability of the Proposed Development such as the 2005 Limpopo Growth and Development Strategy (*LGDS*), 2009 – 2014 Limpopo Employment Growth and Development Plan (*LEGDP*), 2015-2019 Limpopo Development Plan (*LDP*), 2014 Limpopo Green Economy Plan and the 2016 Limpopo Provincial Spatial Development Framework (*LSDF*) are detailed in **Section 4**. The Proposed Development underpins the essence of the goals, objectives, and focus areas, outlined in the abovementioned documents, towards the provision of electricity within Limpopo and thus, support efforts towards economic growth.

## 5.7 LOCAL STRATEGIES

Local government plays a crucial role within the electricity industry in South Africa. Schedule 4B of the Constitution lists electricity and gas reticulation as a local government responsibility. Section 153 of the Constitution places the obligation on municipalities to make certain that the provision of services (which incorporates electricity reticulation) to communities in a sustainable way as well as promote economic and social development. Electricity is a vital funding source for local government, particularly for larger urban municipalities.

As a tier of government, municipalities are responsible for the distribution of electricity to consumers. However, not all households and businesses are supplied with electricity by municipalities as Eskom supplies many customers directly. This can have significant implications for municipal revenues, as well as municipalities' ability to manage outstanding debtors.

The CDM Integrated Development Plan (*IDP*) 2020/21, Polokwane 2030 Economic Growth and Development Plan, 2016 Polokwane Green Goal Energy Strategy Update and Implementation Plan and 2020/21 Polokwane IDP (explained in further detail in **Section 4**) are local strategies that form part of the needs and desirability of the Proposed Development.

The Proposed Development aligns with the main purpose and objectives of the CDM IDP and reinforces the actions required to achieving a growing economy through renewable energy developments. The Proposed Development is identified as an alternative green energy technology and therefore supports the initiative of the green economy and commits to the movement towards a Smart City. The Proposed Development is an energy efficient solution that will contribute towards achieving Polokwane's sustainable green energy and climate mitigation goals, whilst meeting energy demands. The Proposed Development is located within the PLM and commits to the strategies and plans outlined in the IDP.

## 6. DESCRIPTION OF RECEIVING ENVIRONMENT

This chapter provides a description of the biophysical and socio-economic environment of the Project Area, which may be affected by or could affect the Proposed Development. It also summaries the environmental theme sensitivities as indicated in the DFFE Screening Tool Report versus the outcome of the SSV undertaken by various Specialists and the EAP.

### 6.1 DFFE SCREENING TOOL RESULTS

The DFFE Screening Tool Report was generated for the Proposed Development which identifies environmental sensitivities and prescribes the relevant Specialist Assessments associated with a development footprint. The outcome of the screening in terms of environmental theme sensitivity is summarised in **Table 19** below. The Screening Tool Report is attached as **Appendix E**.

**Table 19: DFFE Screening Tool Sensitivities**

Theme	Very High	High	Medium	Low
Agriculture Theme			x	
Animal Species Theme			x	
Aquatic Biodiversity Theme	x			
Archaeological and Cultural Heritage Theme				x
Avian Theme	x			
Civil Aviation (Solar PV) Theme			x	
Defence Theme				x
Landscape (Solar) Theme	x			
Palaeontology Theme			x	
Plant Species Theme			x	
Radio Frequency Interference Theme			x	
Terrestrial Biodiversity Theme	x			

### 6.2 BIOPHYSICAL ENVIRONMENT

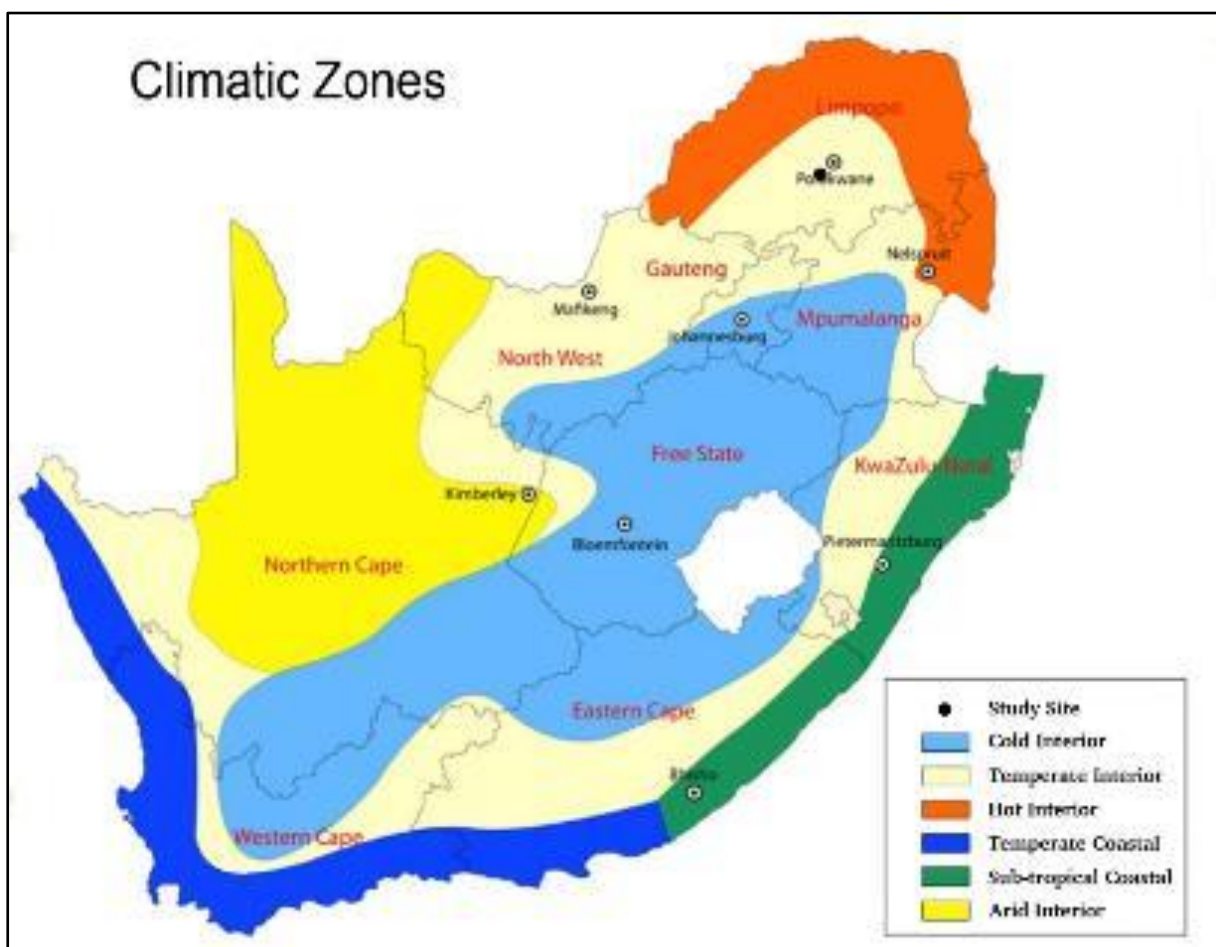
The receiving environment of the Project Area (located on Portion 19 of the Farm Rietvley No. 13, and the Remaining Extent of the Farm Rietvley No. 13 [access road only] with a total footprint of 136 ha) has been described below in terms of the current geographical, physical, biological, socio-economic and cultural character which were aided by the findings of Specialist SSV reports.

#### 6.2.1 CLIMATE

The Proposed Development is situated in the Temperate Interior climatic zone of South Africa. This climatic zone receives a medium rainfall regime ranging from 400 – 601 mm per annum. The Project Area is located on the same plateau as Polokwane and experiences a similar climate. It falls within a summer rainfall region

characterized by dry winters and extended periods of clear skies. As a temperate climate zone, the summers are typically warm to hot, while winters are cool with rare instances of severe frost or very low temperatures. Usually, winter mornings are cool but tend to become warm and pleasant later in the day.<sup>1</sup> The mean annual precipitation for Polokwane is 478 mm. Most precipitation falls between October and March with the peak period being the months of December and January. Rainfall between the months of May and September is generally low, with the average precipitation rate for the period June to August being 4.6 mm<sup>2</sup>.

During the summer months, Polokwane experiences hot and humid weather with temperatures averaging around 30°C during the day and around 18°C at night. The winter season is milder with temperatures averaging around 22°C during the day and around 5°C at night. Large-scale surface airflow over the region is dominated throughout the year by easterly and north-easterly winds. October and November are typically windy with wind speeds up to 13.8 meters per second. The frequency of southerly winds increases during June and July<sup>2</sup>. **Figure 4** below depicts the Project Area in relation to the Temperate Interior climatic zone.



**Figure 4: Climate Region of Polokwane (Source: Flori Scientific Services, 2023)**

### **6.2.2 TOPOGRAPHY AND DRAINAGE**

The Polokwane Municipal area is situated on the 'Pietersburg Plateau' which is bordered in the south by the Strydpoort Mountains, in the west and north by the Waterberg Mountains and in the east by the Great Escarpment<sup>2</sup>. The topography of the Project Area can be described as gently undulating with a range in altitude from around 1435 m to 1483 m above mean sea level.

<sup>1</sup> Flori Scientific Services cc, Terrestrial Ecological Site Verification Report, 2023

<sup>2</sup> City of Polokwane, Integrated Development Plan, 2022-2023

In terms of drainage, South Africa is geographically divided up into a number of naturally occurring Primary Drainage Areas (*PDA*s) and Quaternary Drainage Areas (*QDA*s). Areas are classified into Water Management Areas (*WMA*s) and Catchment Management Agencies (*CMA*s). The Project Area is within PDA 'A' and QDA A71A.

The natural surface water drainage is both in a north and south direction, towards the Bloed and Sand Rivers respectively. The Bloed River is a tributary of the Sand River, and the confluence is approximately 33 km northeast of the Project Area. The Sand River eventually flows into the Limpopo River. The Project Area is also located within the Limpopo WMA (1) and CMA (1)<sup>1</sup>.

### 6.2.3 GEOLOGY

The surface geology in the immediate vicinity of the Project Area is mainly composed of meta-arenaceous rocks such as quartzite, gneiss, migmatite, and granulite. However, as one moves away from the Project Area, intrusive rocks with varying levels of acidity including granitoids can be found<sup>3</sup>.

### 6.2.4 SOILS AND LAND CAPABILITY

The Specialist was able to examine the cross sections of 25 soil profiles up to a depth of 250 mm to 300 mm on shallow soils and concluded that the Project Area falls within the Land Capability Class (*LCC*) VII and VIII, indicating a moderate soil potential. Although these soils are appropriate for livestock and wild game, they are unsuitable for arable crop production. In addition to the 25 profiles examined, observation of soil profiles at the edge of roads, drainage lines, and railway cuttings confirmed that the actual profiles examined were fully representative of the Project Area<sup>4</sup>. Shallow, stony soils were universally distributed across the higher lying slopes of the Project Area.

Other criteria considered for crop yield potential was climate and management practices. The Project Area receives moderate rainfall with a high annual variation coefficient meaning that the planting of annual arable crops is a risk, even if suitable soils were available. A combination of moderate soils and annually variable rainfall is sufficient to maintain large livestock in good condition during the summer months, but the breeding herd would require supplementary feeding in the winter months in order to maintain calving rates and lactation levels. The veld carrying capacity of 5 ha per Large Stock Unit (*LSU*) corresponds with the soil quality and climate of the Project Area<sup>4</sup>.

Upon conducting site verification, the Specialist confirmed that the Project Area's agricultural theme sensitivity is 'medium', consistent with the findings of the DFFE Screening Report. Further investigation and an impact assessment will be undertaken and detailed during the EIR phase. Please refer to **Appendix F1** of this report for the Agricultural Potential SSV Report.

### 6.2.5 ECOLOGY

A desktop screening and site sensitivity verification was undertaken by the Terrestrial Ecological Specialist in August and November 2022 respectively.

From a desktop perspective, the Project Area is not located within a CBA but is demarcated as an ESA 1 in terms of the LCP. CBAs are defined as areas of terrestrial and aquatic features in the landscape which are critical for retaining biodiversity and supporting continued ecosystem functioning and services, whilst ESAs are mostly natural or semi-natural areas that are often used to buffer CBAs as well as form corridors for the movement of

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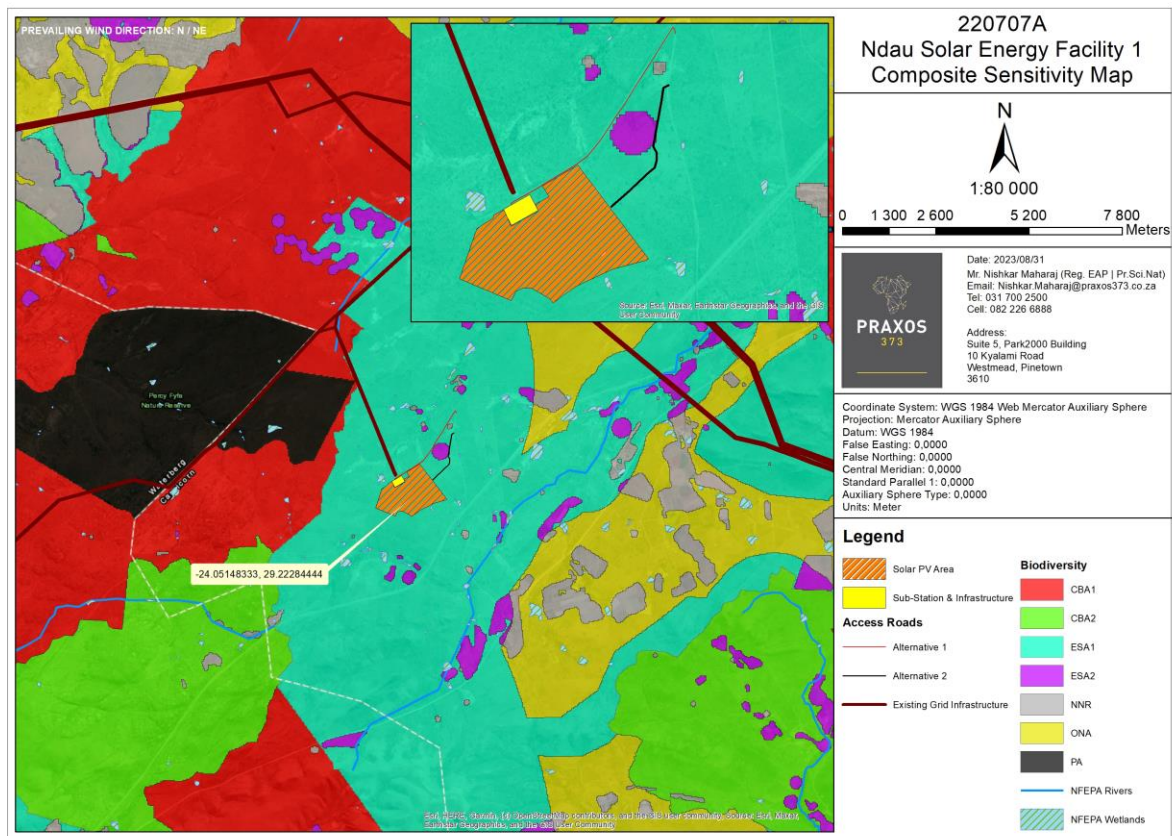
<sup>3</sup> Luhlaza Advisory and Consulting, Geohydrological Desktop Investigation, 2022

<sup>4</sup> Mzansi Agriculture, Agricultural Potential Site Sensitivity Verification Report, 2023



fauna between CBAs and other natural areas. The Project Area is also within a priority area of the NPAES i.e., the Limpopo Central Bushveld. Even though the Project Area is in close proximity to the Percy Fyfe Nature Reserve, which is listed on the DFFE's PAR, development is proposed to take place outside this area. The site verification indicated that the terrestrial biodiversity had a 'medium' level of sensitivity, with some sections being classified as having a 'low' sensitivity. This is in contrast to the DFFE Screening Report, which rated the sensitivity as 'very high'. The Specialist noted that the high sensitivity rating in the DFFE Screening Report was attributed to the ESA, however since the Project Area is primarily used for farming and contains degraded farmlands, the 'very high' sensitivity is refuted.

In accordance with the recommendation of the Specialist, a full Terrestrial Ecological Assessment will be conducted and detailed during the EIR phase which will include impact assessments and mitigation measures to reduce potential impacts of the Proposed Development on the receiving environment.



**Figure 5** below illustrates all the sensitive areas in relation to the Proposed Development. Please also refer to **Appendix G**.

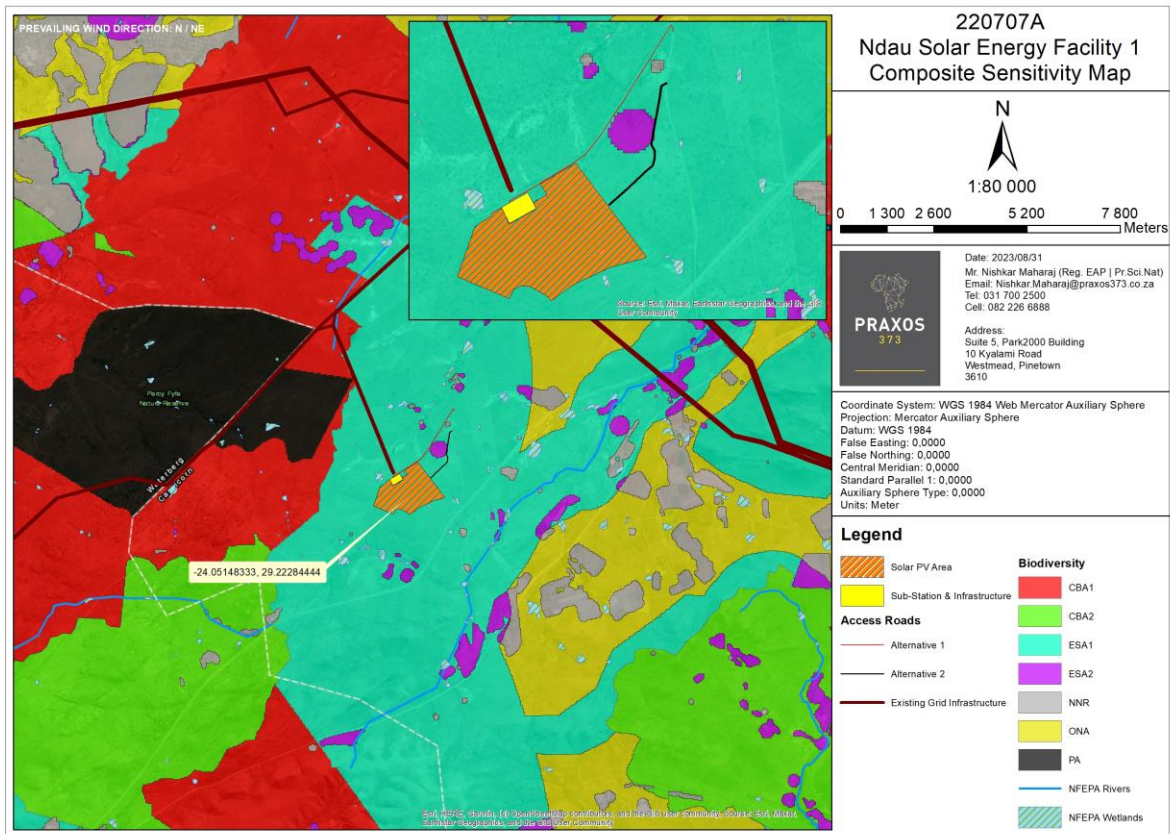


Figure 5: Composite Sensitivity Map (Source: Praxos 373, 2023)

a) Flora

In terms of the plant species theme, the Specialist’s SSV aligned to the ‘medium’ sensitivity rating in accordance with the DFFE Screening Report.

As per the desktop screening and site verification, the Project Area is located within the Central Bushveld Bioregion of the Savanna Biome and lies within the original boundaries of the Polokwane Plateau Bushveld which is not listed as a threatened ecosystem. The Polokwane Plateau Bushveld is characterised by moderately undulating plains with a short open tree layer and a well-developed grass layer to grass plains with occasional trees at higher altitudes.<sup>1</sup>

The Specialist noted the potential occurrence of floral SCC within the Project Area, namely *Aloe marlottii* and *Hypoxis hermerocallidea*. There was also a possibility of RDL floral species being present, however the likelihood of encountering this was not particularly high. A more detailed assessment of flora will be undertaken during the EIR phase. Please refer to **Appendix F8** of this report for the Terrestrial Ecological SSV Report.



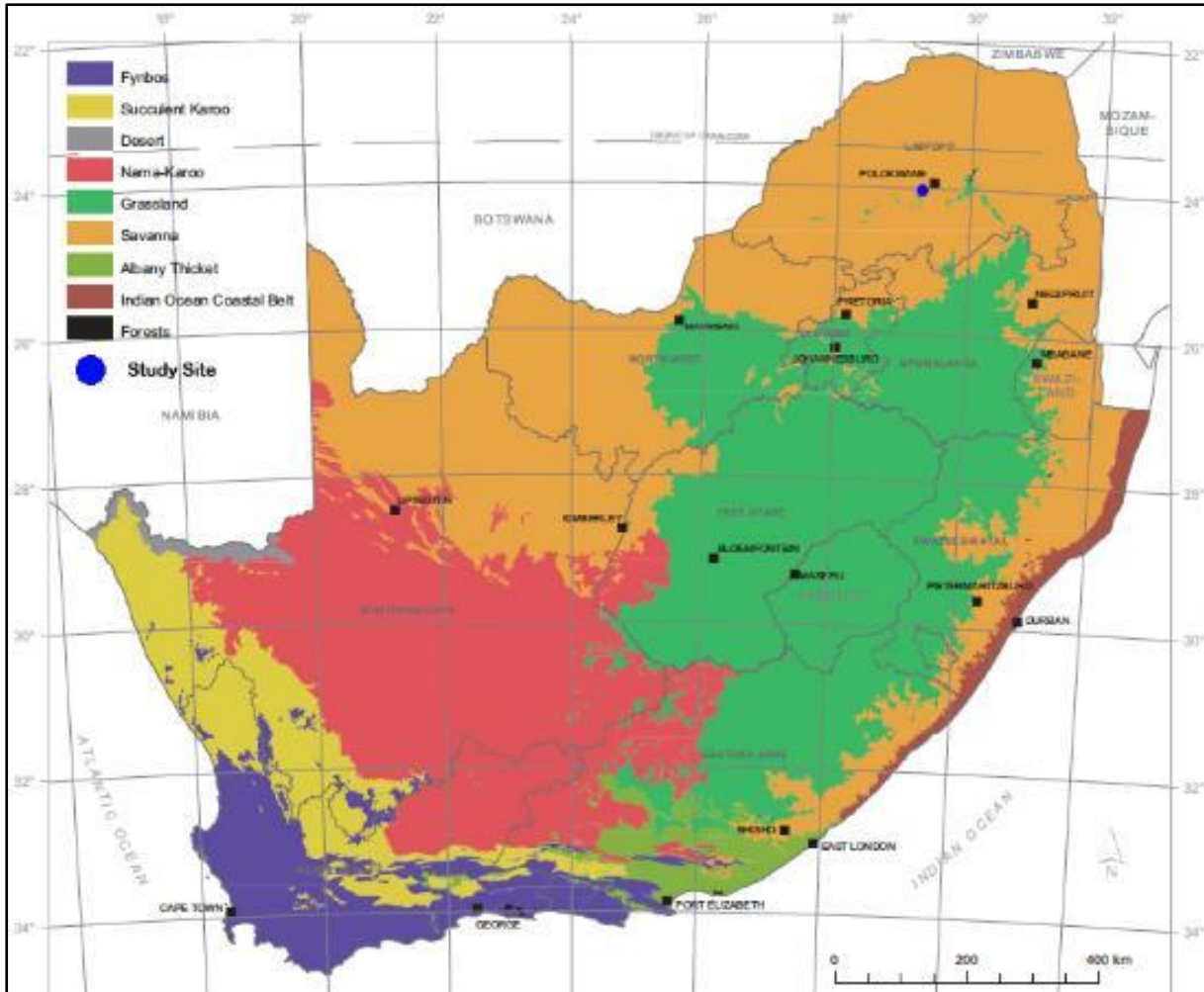


Figure 6: Project Area in Relation to the Savanna Biome (Source: Flori Scientific Services, 2023)

**b) Fauna**

In terms of the animal species theme, the Specialist’s SSV aligned to the ‘medium’ sensitivity rating in accordance with the DFFE Screening Report.

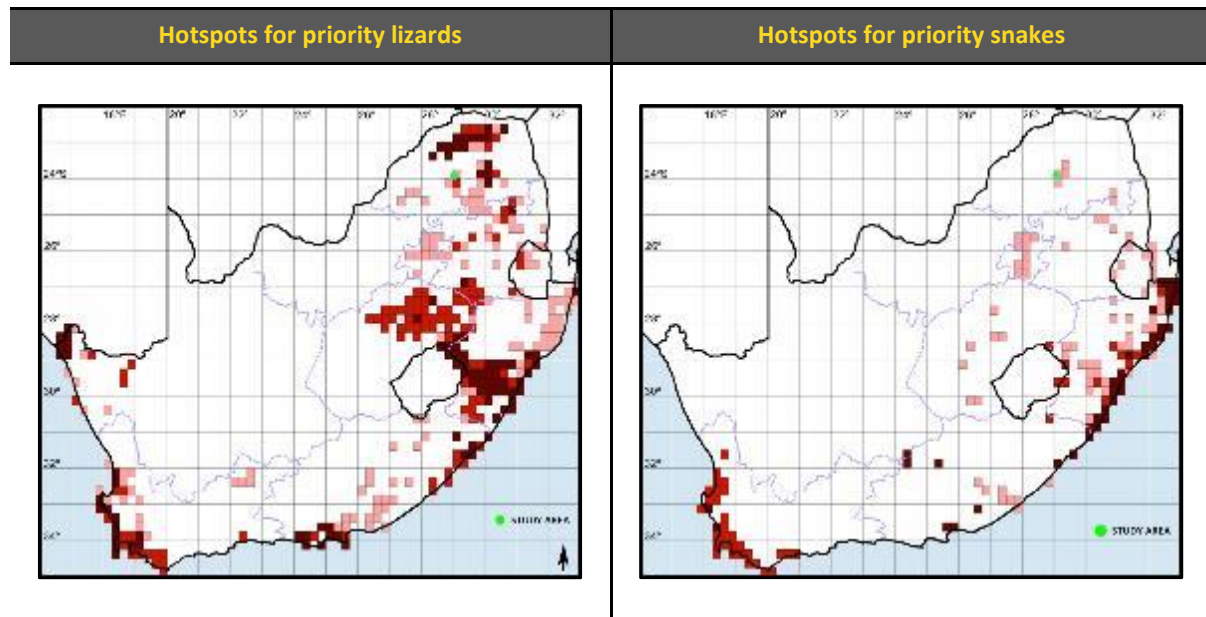
The Project Area is situated in an open bushveld region that has undergone varying degrees of degradation, ranging from moderate to severe. The mountainous region nearby provides favourable living conditions for several types of wildlife species. The general vicinity which includes the Bloed and Sand Rivers, as well as the near-by Percy Fyfe Nature Reserve also provides an ideal habitat for fauna. The Specialist is of the opinion that the Project Area may potentially be home to various indigenous wild faunal species, including a few faunal RDL species and SCC. However, based on previous studies and the Specialist’s knowledge, the number of RDL species permanently present is expected to be medium to low.<sup>1</sup>

The Project Area is not located within any hotspot for butterflies or within an Important Bird Area (*IBA*) but is within the Quarter Degree Square (QDS) that is a hotspot for lizards and snakes. Please refer to **Table 20** below. It was noted that ideal habitats for lizards and snakes SCC in this QDS would be concentrated in the nearby inselbergs, along watercourses, and in protected nature areas.<sup>1</sup>

No unique or highly sensitive terrestrial habitats were observed in terms of ideal habitats for faunal RDL species and SCC. The sensitivity for the faunal component of biodiversity was found to be higher than that of the floral

component<sup>1</sup>. A more detailed assessment of fauna will be undertaken during the EIR phase. Please refer to **Appendix F8** of this report for the Terrestrial Ecological SSV Report.

**Table 20: Hotspots for Priority Lizards and Snakes**



**c) Avifauna**

As per the DFFE screening tool, the avian theme was of ‘very high’ sensitivity at a desktop level. Following the SSV undertaken by the Specialist, it was concluded that the Project Area was instead of ‘low to medium’ sensitivity. A desktop screening followed by a site visit from 13 to 16 December 2022 was undertaken by the Avifaunal Specialist. In consultation with a combination of literature/ sources including electronic databases, maps, and bird atlas’s, a comprehensive list of bird species occurring within the Project Area was compiled and confined to a Quarter Degree Grid Cell (QDGC). It was found that the region was high in avifaunal diversity with approximately 414 bird species known to occur within the QDGC of which 95% was associated with the features that characterises the Project Area i.e., inland water habitats, rocky areas, and savanna/ farmland mosaic. The Southern African Bird Atlas Project which looks at a more confined area and thus represents a more focussed search indicated that 178 species have been recorded in a pentad in which the Project Area falls, 3 of which are SCC i.e., European Roller *Coracias garrulus*, Cape Vulture *Gyps coprotheres*, Marabou Stork *Leptoptilos crumenifer*, as well as 22 species that are endemic to Southern Africa<sup>5</sup>.

The predominant natural habitat on the site, which supports the majority of avifauna in the area, is the natural bushveld that has been grazed to varying degrees. The bushveld has been left to regenerate and is characterised by open bushveld with a more dominant grassy layer and patches or clumps of trees. Bird species observed here included mainly typical bushveld savanna species such as Francolins, Barbets, Hornbills, Shrikes, Tchagras, Robin-chats, Babblers, Prinias, Waxbills, and many Raptors<sup>5</sup>.

The extensive natural bushveld vegetation in the Project Area and surroundings supports the terrestrial species found in the region, including priority species such as gamebirds, raptors, and gregarious passerines. The natural bushveld in the general study area can be split into categories depending on the level of disturbance experienced in the past. The bushveld found on the Ndau 1 site is relatively disturbed by past bush clearing and grazing

<sup>5</sup> Cossypha Ecological, Preliminary Avifaunal Assessment & Site Sensitivity Verification, 2023

activities, however, does not appear to have been ploughed in the past 30 years. This open grassy bushveld is the main habitat for the avifauna on the site<sup>5</sup>.

The bushveld vegetation structure contains certain features that contribute to habitat heterogeneity and variation. Examples of such features include scattered rocky patches across the farm, a small rocky outcrop along the southern border, and an undisturbed bushveld area with a high concentration of *Aloe marlothii*. These features play a significant role in providing natural habitat for birds in the Project Area and contribute to the diversity of species by creating habitat heterogeneity within the landscape<sup>5</sup>.

The wetlands and farm dams serve as important habitats for aquatic birds and species commonly found in wetland environments. These areas offer surface water and hygrophilous vegetation such as sedges and restios, that attract a variety of bird species. Additionally, the presence of tall, dense vegetation attracts wetland nesting species.

The following bird species were recorded at the dams and wetlands<sup>5</sup> on the Ndau 1 site:

- White-faced Duck *Dendrocygna viduata*.
- Yellow-billed Duck *Anas undulata*.
- Red-billed Teal *Anas erythrorhyncha*.
- Egyptian Goose *Alopochen aegyptiaca*.
- Spur-winged Goose *Plectropterus gambensis*.
- Little Grebe *Tachybaptus ruficollis*.
- Red-knobbed Coot *Fulica cristata*.
- Lesser Moorhen *Gallinula angulata*.
- Reed Cormorant *Microcarbo africanus*.
- Grey Heron *Ardea cinerea*.
- Little Egret *Egretta garzetta*.
- Hamerkop *Scopus umbrette*.

The following bird SCC were recorded during the SSV field survey:

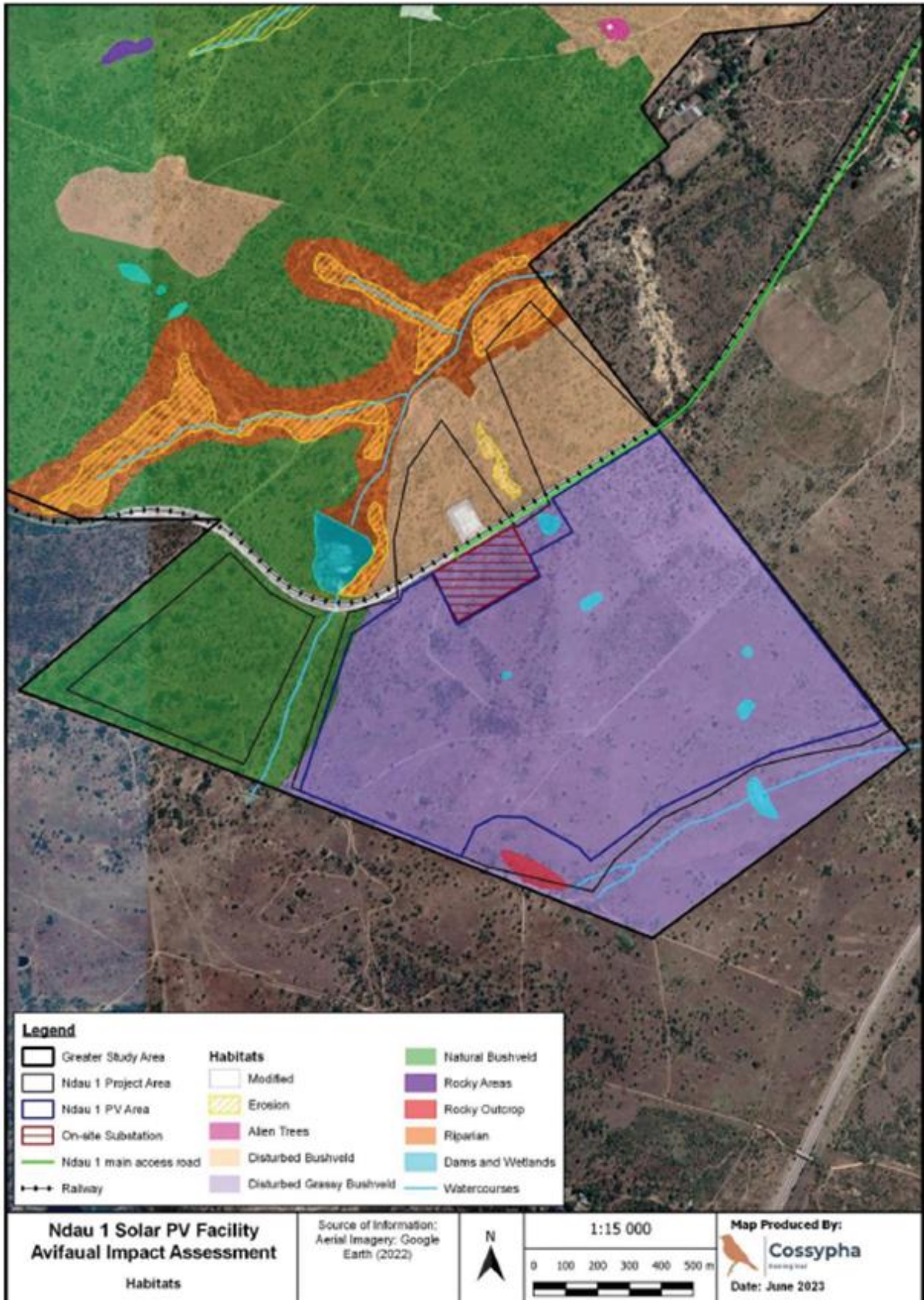
- White-backed Vulture *Gyps africanus*, listed as Critically Endangered at the national and global level - recorded circling over-head and one was observed sitting on a power line just outside the Project Area.
- Lanner Falcon *Falco biarmicus*, listed as Vulnerable at a national level.
- European Roller *Coracias garrulus*, a non-breeding migrant to the area, listed as Near Threatened at a national and global level.

The bird population in the Project Area was highly diverse, with a total of 131 species recorded in the Project Area and its immediate surroundings. Seventeen species recorded were endemic to the Southern African region. The identification of birds was conducted through direct observation, including sightings and calls, as well as field signs such as tracks or feathers. In addition to the specific species, many generalist birds, such as Doves, Guineafowl, Lapwings, Canaries, and Sparrows were also documented in and around the Project Area<sup>5</sup>.

The natural bushveld was considered to be of 'medium' sensitivity, whilst wetlands, dams, rocky areas, and Aloe veld were of 'high' sensitivity. Please refer to **Figure 7** and **Figure 8** below showing avifaunal habitats and corresponding sensitivities respectively. Further investigation will be undertaken during the EIR phase which includes structured and repeated data collection on which the Specialist will base the impact assessment report

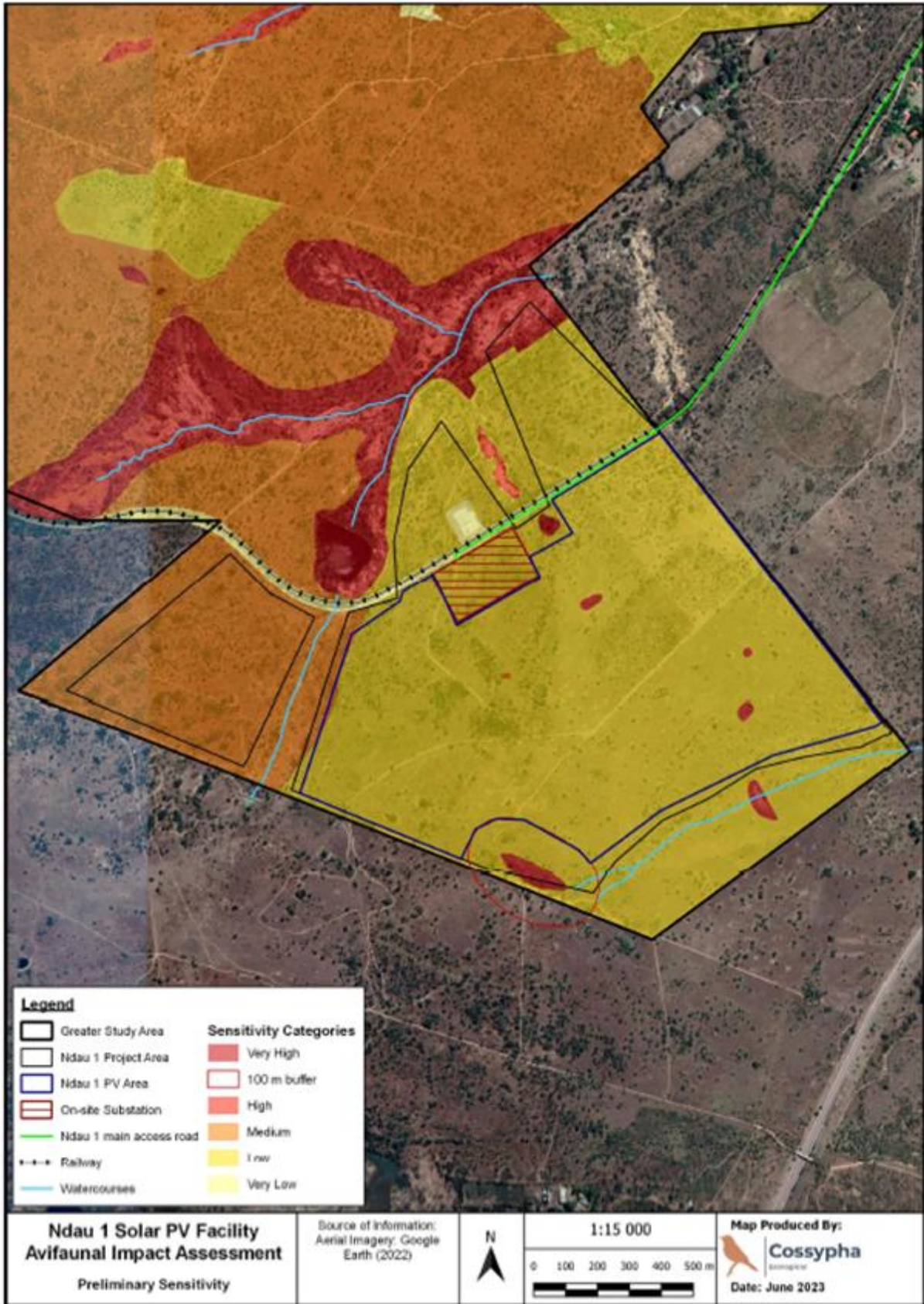


and provide a baseline against which post-construction monitoring can be compared. Please refer to **Appendix F3** of this report for the Avifaunal SSV Report.





**Figure 7: Avifaunal Habitats within Project Area (Source: Preliminary Avifaunal Assessment Report, 2023)**



**Figure 8: Avifaunal Habitat Sensitivity (Source: Preliminary Avifaunal Assessment Report, 2023)**

### 6.2.6 HYDROLOGY

A desktop screening followed by a SSV was undertaken by the Aquatic Specialist in January 2023. As per the DFFE screening tool, the Project Area lies within a ‘very high’ sensitivity area in terms of aquatic biodiversity. The outcome of the SSV indicated that the aquatic sensitivity of the Project Area was of ‘high’ sensitivity but would require further investigation. There are no aquatic CBA’s or Freshwater Ecosystem Priority Area (FEPA) river sub-catchments within the Project Area.<sup>6</sup>

#### a) **Surface Water**

The Project Area lies within the Sand River Sub-Catchment of the Limpopo River. The Sand and Bloed Rivers serve as the main watercourses that are located in the vicinity of the Project Area. These watercourses flow in a north-westerly direction, with the Bloed River meeting the Sand River just north of Polokwane.<sup>6</sup>

There is a small in-stream farm dam located west of the Project Area, as depicted in **Figure 9**. The Project Area contains artificial FEPA wetlands that are associated with the dams, with some natural wetland habitat mapped adjacent to them. These have low aquatic ecosystem significance but may provide aquatic habitat for certain biota, such as the Giant Bullfrog, a near threatened species which breeds in ephemeral pans and farm dams and has been recorded in the larger Sand River, to the east of the Project Area <sup>6</sup>.

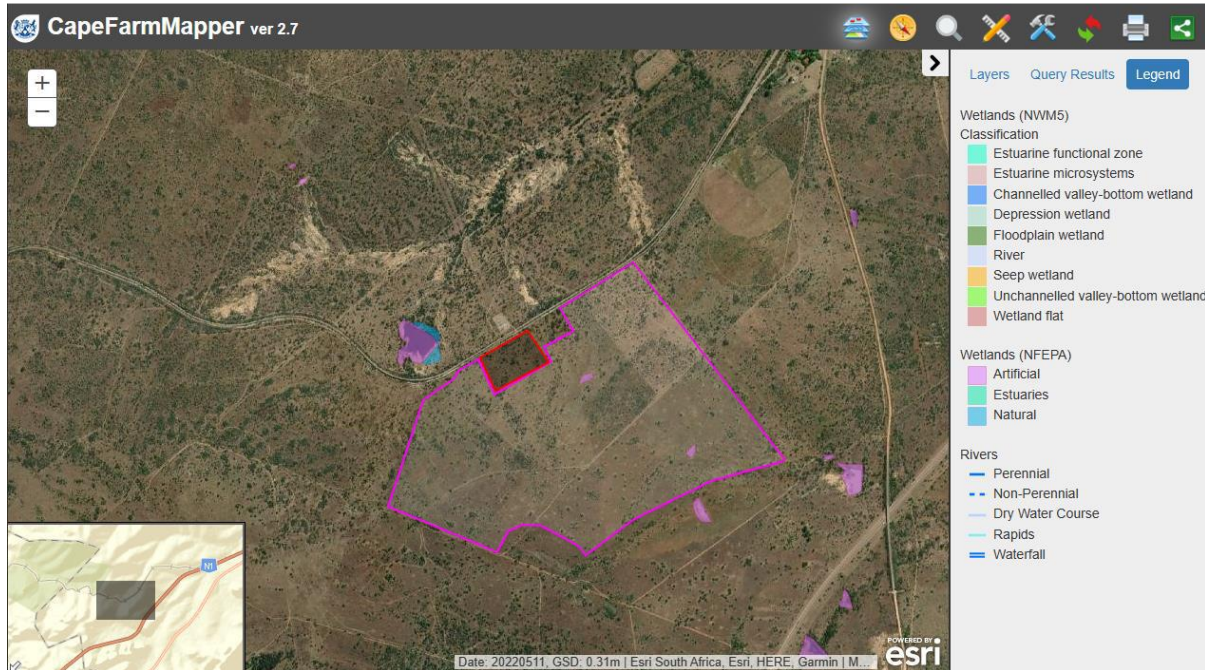
From the site inspection undertaken, the Specialist noted that the erosion of the watercourse channels nearby has resulted in the loss of the indigenous riparian vegetation and in some places, it has been replaced with alien invasive species. As a consequence, the watercourses are significantly altered both within their channels and to a great extent within their surrounding riparian areas. Both the small and large watercourses in the vicinity are sensitive to disturbances and modifications in their flow and have been classified as having low and moderate ecological significance respectively<sup>6</sup>.

A more detailed Aquatic Impact Assessment will be undertaken during the EIR phase including impacts, recommendations and mitigation measures. Please refer to **Appendix F2** of this report for the Aquatic SSV Report.

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<sup>6</sup> Antonia Belcher, Aquatic Site Sensitivity Verification Report, 2023





**Figure 9: Farm Dam (Source: Antonia Belcher, 2023)**

**b) Groundwater**

As indicated above, the Project Area lies in a SWSA for groundwater i.e., the Upper Sand (Polokwane) Aquifer which covers an area of approximately 96.5 km<sup>2</sup> in the upper Sand River Catchment<sup>6</sup>. The Hydrogeologist conducted a desktop investigation utilising various sources and in accordance with the South African National Standards (SANS) 10299:2003 guideline.

The Project Area is underlain by an intergranular and fractured aquifer system with an approximate yield of 5 litres/ second (ℓ/s). This indicates that the aquifer is highly productive even though the region is characterised as semi-arid. Towards the south and west of the Project Area, the aquifers can also be described as intergranular and fractured with borehole yields ranging from 0.5 to 2 ℓ/s and 0.1 to 0.5 ℓ/s respectively. As such, these aquifers are classified as moderately productive and poorly productive systems. In terms of Electrical Conductivity (EC), values range from 70 to 300 millisiemens per meter (mS/m) with some areas showing EC values between 0 and 70 mS/m which is indicative of a mixture of moderate to good groundwater quality. The depth to groundwater within the Project Area and surrounds ranges from 10 m to 17 m and 17 m to 25 m below ground level (bgl) respectively. The region’s groundwater recharge is between 14 and 28 mm/year, suggesting that groundwater resources have a regional recharge rather than local one<sup>3</sup>.

The Project Area is located within quaternary catchment A71A. If the local groundwater level follows the local topographical gradient, the Specialist notes that the Project Area is positioned east of the groundwater divide. This suggests that any pollution that occurs within the Project Area will pollute downstream water resources, both surface and groundwater<sup>3</sup>.

A desktop hydro census was also conducted at a 2 km and 5 km radius of the Project Area. The information indicated that there are a number of boreholes within and in the vicinity of the Project Area however detailed information such as groundwater level, use, type and pumping rates were unavailable<sup>3</sup>.

The Specialist noted that the Project Area is classified as having ‘moderate’ sensitivity based on the hydrological aquifer type and drainage patterns. A more detailed assessment of geohydrological conditions including a field hydro census will be undertaken during the EIR phase. Please refer to **Appendix F5**.

### **6.2.7** LANDSCAPE

A Landscape and Visual SSV site visit was undertaken over a single day period (13<sup>th</sup> of May 2023) to verify the likely visibility of the Proposed Development, the nature of the affected landscape and affected receptors. The site visit was planned to ensure that weather conditions were clear ensuring reasonable visibility. Please refer to **Appendix F6**.

The Specialist noted the following visual receptors during the site visit:

#### **a) Area Receptors:**

Area receptors are places that cannot be defined by a point or a line. They might include settlements or protected areas. From the site visit possible area receptors include<sup>7</sup>:

- Protected areas particularly the Percy Fyfe Nature Reserve which is within 1.8km of the proposed site.

#### **b) Linear Receptors:**

Linear receptors generally include routes through the area<sup>7</sup>:

- Local Roads that are generally un-surfaced roads that link the area to the R101 south of the proposed site and to the south-east close to Mokopane.
- The RN1 and the R101 both of which run parallel to the south of the proposed site. The N1 is the closer of the two roads being located approximately 500m from the site.

#### **c) Point Receptors:**

Point receptors include isolated, homesteads most of which are likely to be associated with agriculture, however, a number are likely to have a tourism use (Lodges) particularly those within more natural areas.

The Landscape and Visual SSV found that the Project Area is neither protected nor is it does it form part of a rare landscape perspective, thus there are no no-go areas to be taken into account. The SSV report does advise on guiding the development away from areas of the site that would make it most obvious to surrounding sensitive receptors mentioned above.<sup>7</sup>

The report found there to be ‘medium’ and ‘low’ sensitivities within the Project Area. This is in contrast to the findings of the DFFE Screening Report, which listed the Project Area as having a ‘very high’ sensitivity. A Visual Impact Assessment (which will also investigate any glint and glare issues) will be conducted and detailed during the EIR phase.

### **6.2.8** CULTURE AND HERITAGE

The Heritage Specialist conducted a desktop analysis followed by a field verification survey of the Project Area.<sup>8</sup> No historical or archaeological (both Stone Age and Iron Age) features, structures, assemblages or sites were recorded within the Project Area. However, the following should be noted:

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<sup>7</sup> Environmental Planning and Design, Landscape and Visual Impact Baseline Report, 2023

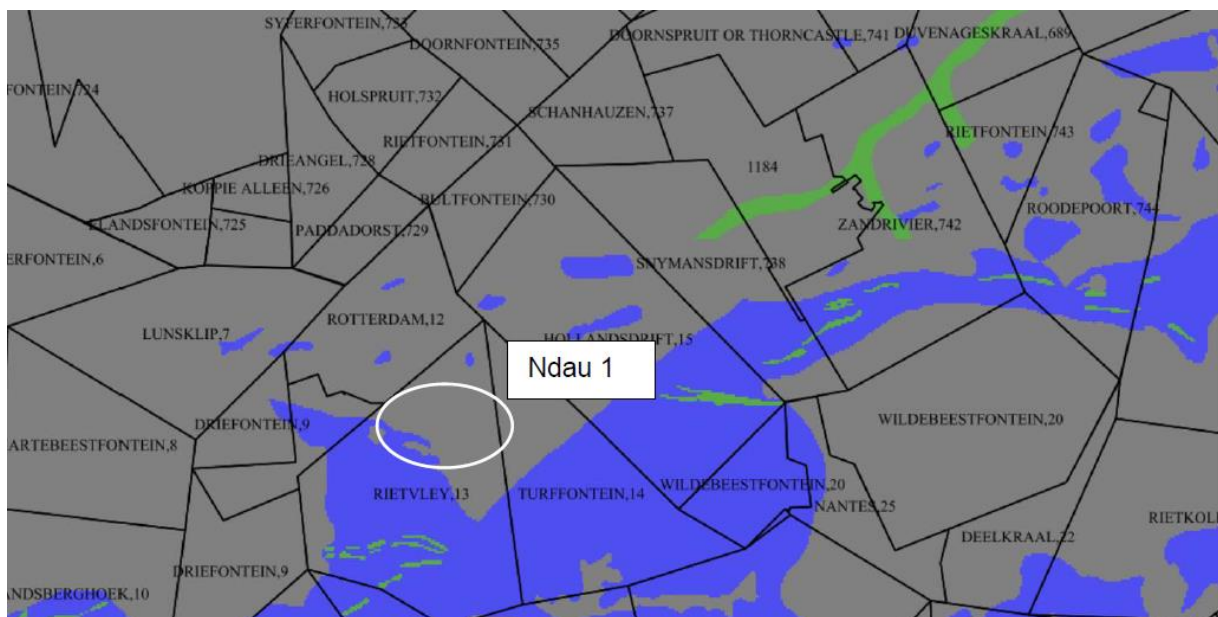
<sup>8</sup> Francois P Coetzee, Cultural Heritage Site Verification Report, 2023



- The access road associated with the Proposed Development runs along the Pretoria-Polokwane railway which was officially opened in 1889 (there is a small railway tunnel 96 m from the site boundary).
- Several culverts were constructed running underneath the railway line. These were constructed with dressed granite and probably date to the 1880s (the nearest being 60 m from the Project Area boundary).
- Several historical railway houses, a graveyard and the Geyser Station are located along the trajectory of the proposed road.
- Care should be taken during the construction phase to prevent any impact on these heritage remains which are older than 60 years and therefore protected under the NHRA (Act No. 25 of 1999).<sup>8</sup>

As per the DFFE screening tool, the Project Area was of ‘low’ heritage sensitivity. Upon desktop analysis undertaken by the Specialist, it was found that parts of the Project Area were of ‘medium’ sensitivity. A Phase 1 Heritage Impact Assessment of the Proposed Development has been recommended and will be undertaken during the EIR phase. Please refer to **Appendix F4**.

The palaeontological sensitivity map available from the SAHRIS database and as shown in **Figure 10** below indicates the site to lay within a grey (zero) and blue (low) sensitivity for both the farms. The Palaeontologist has confirmed that no further palaeontological assessment will be required for the survey footprints. Please refer to **Appendix F4**.



**Figure 10: Palaeontological sensitivity of the region (SAHRIS 2022)**

### 6.2.9 AIR QUALITY

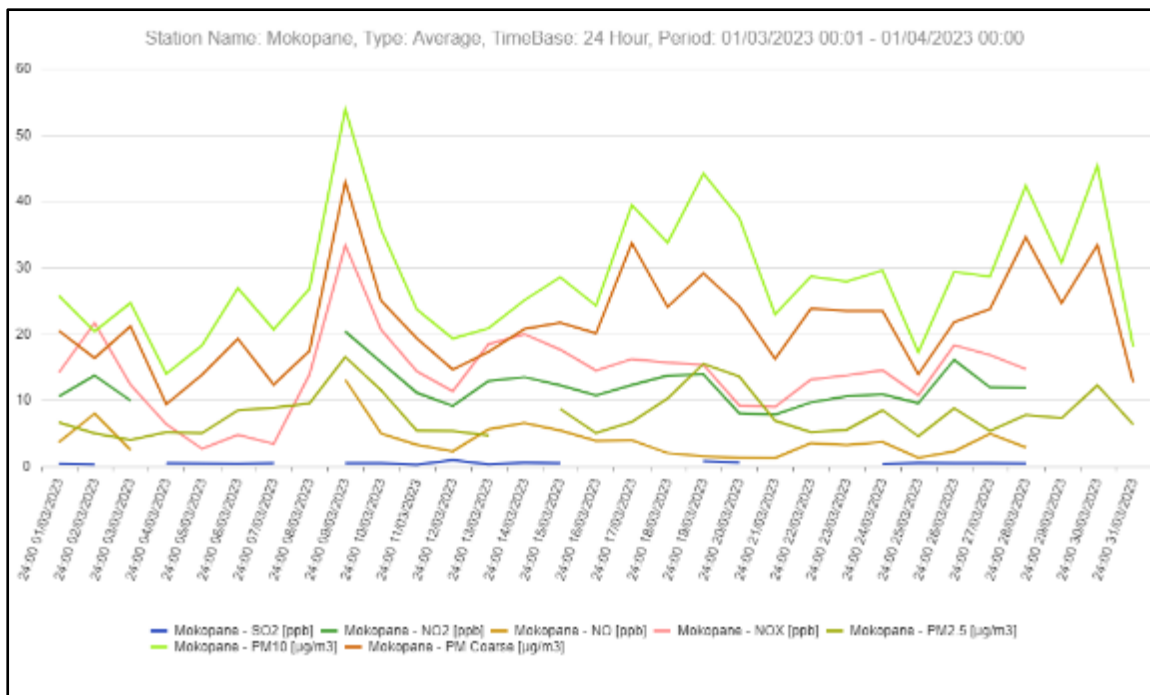
Polokwane has an air quality monitoring station that measures levels of pollutants such as Sulphur dioxide ( $SO_2$ ), Nitrogen Oxides ( $NO_x$ ), and Particulate Matter ( $PM$ ). According to the PLM IDP, the ambient air quality is measured in three places within the city, i.e., the Civic Square, Annadale (close to the industrial area) and Seshego.

The PLM IDP further reports that there were several air pollution risks within PLM that were identified and are as follows:

- Polokwane smelter – Sulphur Oxides ( $SO_x$ ), solid particulates,  $NO_x$ .

- Municipal landfill - odours, carbon monoxide, methane, particulates.
- Industrial activities - coal burning and related processes.
- Ready-mix materials quarry – dust.
- Motocross track - dust, noise, carbon monoxide.
- Old asbestos dump/factory, Industrial - asbestos fibres, dust.

The monitoring equipment of PLM was not operational at the time of writing of this report due to certain challenges, and as evident from the absence of monitoring data on the South African Air Quality Information System (SAAQIS). Ambient air quality data was therefore retrieved for the month of March 2023 from the next closest station located in Mokopane for SO<sub>2</sub>, Nitrogen dioxide (NO<sub>2</sub>), Nitric oxide (NO), NO<sub>x</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and PM coarse and is represented in **Figure 11** below. This station is located approximately 37 km away from the Project Area.



**Figure 11: Ambient Air Quality (Source: SAAQIS, 2023)**

### 6.3 SOCIO-ECONOMIC ENVIRONMENT

A Socio-Economic Baseline Assessment was undertaken during May 2023. The report relied on both primary and secondary sources of data as part of its assessment. Please refer to **Appendix F7**.

Primary sources of data included a site visit undertaken on 02 May 2023 to get an understanding of the locational factors of the proposed development; however, none of the local residents were consulted.

Secondary data was sourced from the following databases and documents:

- Previously completed studies.
- Statistics South Africa (*StatsSA*) Census 2011
- StatsSA Labour Force Survey
- Quantec Research database
- Industrial Policy Action Plan (*IPAP2*), 2018/19–2020/21

- National Environmental Management Act (No. 107 of 1998) (NEMA)
- National Development Plan (NDP) 2011–2030
- New Growth Path Framework (NGPF) 2010
- Provincial:
  - Limpopo Strategic Plan 2020-2025
  - Limpopo Development Plan 2015-2019
- Local:
  - Capricorn District Municipality Integrated Development Plan (2022/2027)
  - Polokwane Local Municipality Integrated Development Plan (2021/2026)
  - Polokwane 2030 Development Plan
- Other national, provincial, and local government strategic documents and policies

The Project Area is located within the vicinity of a few scattered residential areas, which are expected to be affected by the Proposed Development. Additionally, there are several businesses established in close proximity to the area, including Ysterberg Lodge, Caltex Fuel Station, Geyser Traction Substation, and various privately owned farms<sup>9</sup>.

### **6.3.1 PROJECT AREA'S COMPOSITION AND LOCATIONAL FACTORS**

The Project Area is in the PLM, a Category B municipality in the Limpopo Province. It is one of four local municipalities together with Blouberg, Molemole and Lepelle-Nkumpi that forms part of the CDM.

The combination of Polokwane's status as the provincial capital, its diverse economy, and its strategic location makes it a crucial center for commerce, services, and governance. Makgwareng, as the other formal town in the municipality, also contributes to the overall socio-economic development of the region, albeit on a smaller scale<sup>9</sup>.

### **6.3.2 SENSE OF PLACE, HISTORY, AND CULTURAL ASPECTS**

Polokwane was founded in 1886 by Voortrekkers, a group of Dutch settlers who were fleeing British rule in South Africa. The city was originally named Pietersburg, after Petrus Joubert, a Boer general who fought in the Boer War. In 2002, the city was renamed Polokwane, which means "Place of Safety" in Northern Sotho. Polokwane is a major commercial and industrial centre. The city is home to several factories, including those that produce food, beverages, and clothing. Polokwane is also a major transportation hub, with several roads and railways connecting it to other parts of South Africa. Polokwane is a popular tourist destination<sup>9</sup>.

The city is home to several historical and cultural attractions, including the Polokwane Game Reserve, the Polokwane Museum, and the Peter Mokaba Stadium. Polokwane is also a good base for exploring the surrounding countryside, which is home to several national parks and game reserves. Polokwane is a city with a rich and diverse cultural heritage. The city is home to a number of different ethnic groups, each with its own unique culture and traditions. Polokwane is also home to a number of different festivals throughout the year. These festivals celebrate the city's rich cultural heritage and offer visitors a chance to experience the different cultures that make up the city<sup>9</sup>.

Some of the most popular cultural attractions in Polokwane include:

- Polokwane Art Museum: This museum houses a collection of over 800 artworks by artists from Limpopo Province.

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<sup>9</sup> Urban-Econ, Socio-Economic Baseline Assessment, 2023

- Polokwane Museum: This museum tells the story of the history of Polokwane and the Limpopo Province.
- Mapungubwe World Heritage Site: This site is home to the ruins of an ancient African kingdom.
- Bakone Malapa Open Air Museum: This museum is a reconstruction of a traditional Sotho village.
- Thathe Vondo Cultural Village: This village is home to the Venda people.

Closer to the Proposed Development, there are two main tourist destinations in the surrounding area which are the Percy Fyfe Nature Reserve and the H.L Crause Private Nature service. There is also a hotel close to the area which is the Protea by Marriott Hotel.

It is important to evaluate the tourist attractions which are within close proximity to the Proposed Development to ensure that no notable tourist attractions or wildlife will be impacted. The operations of the Proposed Development are not expected to have a significant impact on these establishments. It is also important to consider the potential negative impacts that may arise during the construction phase. Careful planning and mitigation measures will be necessary to minimise any adverse effects and ensure the preservation of the surrounding protected areas and the uninterrupted experience for visitors to these tourist accommodations and protected areas<sup>9</sup>.

### **6.3.3 DEMOGRAPHICS, HEALTH, AND CRIME PROFILES**

In PLM, males make up a greater proportion (54%) of the population than females. As of 2021, the population of PLM was estimated to be around 644 489 people, residing in 181 098 households. This population represents approximately 49% of the total population of CDM and about 11% of the entire population of Limpopo province. The average household size in PLM is approximately 3.8 people per household. While this figure is slightly higher than the district average of 3.7, it is slightly lower than the provincial average of 3.9.

Crime is an important indicator of a community's socio-economic status. Serious crimes comprise of contact crimes, sexual offences, robberies with aggravating circumstances, crimes involving property, and crimes discovered as a result of police action. The highest crime rate was recorded in 2020. This increase in crime can be attributed to various factors, including the impact of the COVID-19 pandemic and the subsequent lockdown regulations implemented in 2020.

The stringent lockdown measures resulted in job losses and economic hardships for many individuals, which may have contributed to a sense of desperation and an increase in criminal activities as people sought ways to improve their circumstances. However, as the global pandemic restrictions began to ease in 2021, the crime rates showed a decline, potentially indicating the restoration of employment opportunities and improved socio-economic conditions.

Notably, 2022 witnessed the lowest crime rate among the observed years, suggesting positive developments in the economy of PLM and progress towards sustainable development. This decline in crime rates reflects the potential positive impact of ongoing efforts in enhancing economic opportunities, social welfare, and overall well-being within the municipality.

The introduction of a new development project could potentially contribute to an increase in crime rates in an area. This is because the construction and operation of the new development project often attract a transient population, which can introduce new dynamics and challenges related to crime<sup>9</sup>.

#### **6.3.4 INCOME AND EDUCATION LEVELS**

According to the 2011 Census data, a significant portion of PLM's population falls within the category of low to middle income household. The majority of households (19.7%) fall within the income range of R38 201 to R76 400, which translates to approximately R3 183 to R6 367 per month. On the other hand, about 7% of the total households earn above R307 601 annually or approximately R25 633 per month. The prevalence of low to middle income households in the PLM suggests that many residents face economic challenges and may experience limited financial resources.

Low average income levels are often related to the difficulty of getting access to adequate education. Education includes various levels, each of which reflects a broad segment of the education "ladder," i.e., the development from elementary learning to more difficult learning experiences. PLM can be considered a low to middle income area as the highest percentage (19.7%) of individuals earn R19,601 - R38,200. Low average income levels are often related to the difficulty of getting access to adequate education. Education includes various levels, each of which reflects a broad segment of the education "ladder," i.e., the development from elementary learning to more difficult learning experiences.

According to the available data, it is observed that a significant portion of PLM's adult population has limited formal education. Approximately only 7% of the total adult population has not received any form of formal education, while roughly 18.0% have completed at least matriculation (secondary education). In contrast, less than 10% of the adult population in PLM's holds higher education degrees, including bachelor's degrees, honours degrees, master's degrees, and doctorate degrees.

The educational landscape in PLM plays a significant role in shaping the labour market dynamics. The low levels of education among residents tend to be associated with a predominance of low-skilled labour. This correlation between educational attainment and skill level suggests that the general population faces challenges in accessing higher-paying job opportunities.

Furthermore, the observed low educational levels in PLM can be linked to the higher proportion of residents belonging to lower-income brackets. The limited educational opportunities and qualifications contribute to the prevalence of lower-income households within the municipality. This connection between educational attainment and income further underscores the socioeconomic challenges faced by the general population<sup>9</sup>.

#### **6.3.5 LABOUR FORCE AND EMPLOYMENT STRUCTURE**

In 2021, the employed population in PLM constituted approximately 73% of the total employed population in the municipality. The working-age population (WAP) accounted for 73% of PLM's total population, which corresponds to around 464,022 individuals.

Some 164,921 individuals amongst the economically active population are employed, representing approximately 68% of the total economically active individuals. On the other hand, the total number of unemployed individuals amounts to 79,114, constituting around 32% of the economically active population.

Regarding the formal employment sector, skilled workers make up approximately 33%, while semi-skilled workers account for 43%, and low-skilled workers represent 24% of the total formally employed individuals<sup>9</sup>.

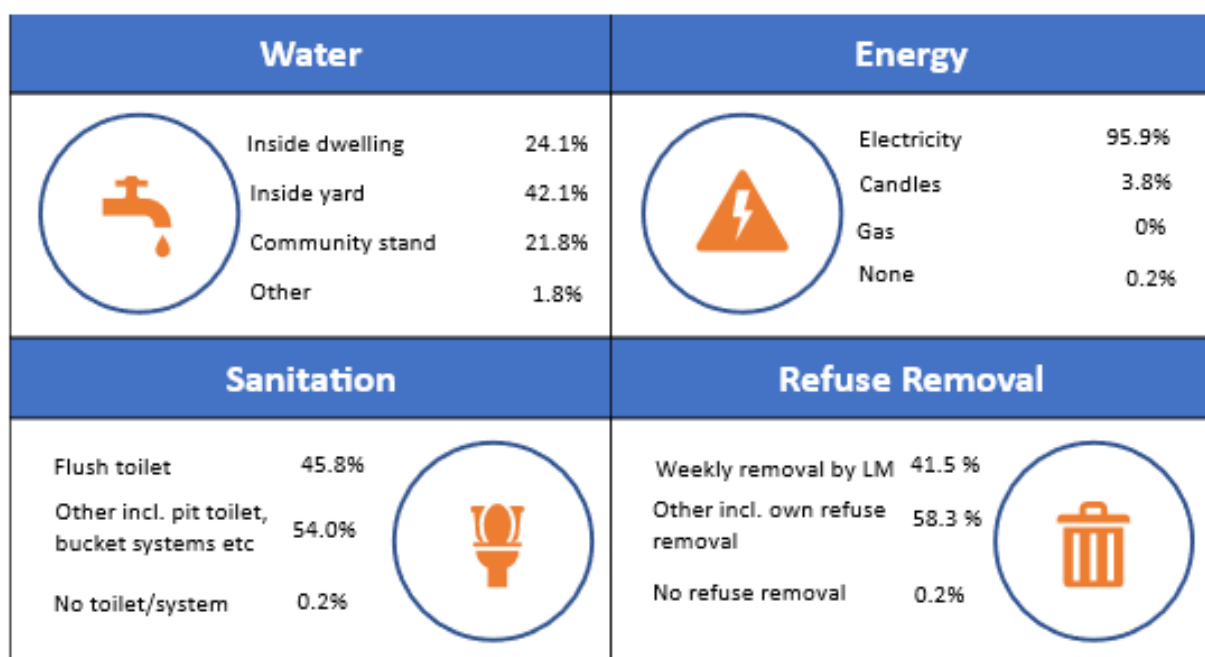
#### **6.3.6 ACCESS TO BASIC SERVICES**

**Figure 12** provides valuable insights into the access to basic services in PLM. It reveals that 24% of households within the municipality have piped water within their yards, while approximately 42% have piped water inside

their dwellings. For about 24% of households, access to water is facilitated through a community stand, while the remaining households rely on alternative sources such as water tankers, boreholes, rainwater tanks, rivers/streams, and water vendors.

In terms of energy access, an impressive 96% of households in PLM have access to electricity provided by Eskom. However, a small portion, approximately 4%, still rely on candles for energy, while 4.1% use paraffin, and a minority of households use other sources such as gas. Regarding sanitation, only roughly 45.8% of households have access to flushing toilets with sewage systems, while the 0.2% have no access to any toilet system. About 41.5% of the households have their refuse removed by the community's waste on a weekly basis.

The above subsection suggests that besides the provision of electricity, the PLM is likely to be underdeveloped and that the standards of living are fairly low. The Proposed Development is unlikely to improve the PLMs' access to basic services, however, it may indirectly impact the standards of living of the local community<sup>9</sup>.



**Figure 12: Access to Basic Services (Source: Quantec, 2022)**

A detailed Socio-economic Impact Assessment will be undertaken during the EIR phase.

#### 6.4 DEFENCE AND CIVIL AVIATION

No defence sites or civil aviation domes were recorded within or in close proximity to the Proposed Development bases on the EAP's site visit and desktop screening. It is the EAP's opinion that this project will not have any significant impact on the civil aviation or national defence infrastructure. In terms of the DFFE Screening Tool, the Civil Aviation and Defence theme for the Proposed Development was a medium and low sensitivity, respectively. However, from the SSV undertaken, it is the EAP's opinion that the Proposed Development will have a low sensitivity rating for both themes. Thus no impact assessment will need to be undertaken.

However, the South African National Defence Force (SANDF) has been included as a stakeholder on the Interested and Affected Party (I&AP) database and will be afforded the opportunity to provide comments during public participation conducted as part of the S&EIR process.

## 6.5 RADIO FREQUENCY INTERFERENCE ASSESSMENT

An RFI Assessment will not be undertaken during the EIR phase. SARAQ have already assessed the site and confirmed that the project represents a low risk of interference to the nearest SKA radio telescope with a compliance surplus of 405.08 dBm/Hz. As such, SARAQ do not have any objection to the proposed development.

Based on the above communication, it is the EAP's opinion that this project will not have any significant impact on the SKA radio telescope infrastructure and the medium sensitivity rating assigned by the DFFE screening tool for the RFI theme is disputed. Thus, no impact assessment will need to be undertaken.

SARAQ has also been included as a stakeholder on the I&AP database and will be afforded the opportunity to provide comments during public participation conducted as part of the S&EIR process.



## 7. POTENTIAL IMPACTS ON THE ENVIRONMENT

The primary objective of the Scoping phase in an EIA is to identify potential environmental and social consequences of a Proposed Development, such as impacts on air and water quality, biodiversity, cultural heritage, and human health and safety. Additionally, the Scoping phase seeks to establish the extent of the EIA study required to comprehensively evaluate and manage these impacts, including what Specialist input is required, the types of data that will need to be collected and the analysis techniques that will be utilized. Through recognizing and recording potential environmental issues, the Specialists can focus on the significant aspects, giving an outline for assessing the Proposed Development's effects on the environment and vice versa. The inputs of the project team, stakeholders, I&APs, and Specialists are used to perform this analysis. The scoping phase's initial identification of potential environmental (biophysical, social, and cultural) impacts is investigated in greater detail during the EIR phase of the process.

### 7.1 PRELIMINARY ENVIRONMENTAL IMPACTS

Potential impacts associated with the Proposed Development, according to the respective phases (construction, operational and decommissioning) during which they will occur, have been identified. All impacts have been split into 'general impacts' and 'Specialist impacts'. For the purposes of the S&EIR process for the Proposed Development, the following distinction can be made between the impacts:

1. **GENERAL IMPACTS:** Impacts which have been identified by the EAP. Examples of key issues identified by the EAP, which will be unpacked as general impacts include:
  - Waste management.
  - Noise management.
  - Air quality management.
  
2. **SPECIALIST IMPACTS:** Impacts which have been identified by the Specialists or impacts which have been identified by the EAP which require input from Specialists. Examples of key issues identified as requiring Specialist input, which will be unpacked as Specialist impacts include:
  - Ecological impacts on fauna, flora, and avifauna.
  - Agricultural soil potential.
  - Socio-economic impacts associated with the development.
  - Aquatic impacts.
  - Groundwater impacts.
  - Landscape and visual impacts including glint and glare.
  - Culture and heritage.

The impacts identified below will require further investigation either by the EAP or by a qualified Specialist. It is likely that additional impacts will be added or that some may become redundant, based on the results of the site assessments of the EAP and of each Specialist during the EIR phase. Mitigation measures at a high level have been considered below, however specific recommendations and mitigation measures will also be stipulated once full Specialist Studies and impact assessments have been completed. The proposed method of investigation to be employed during the EIR phase has been provided.



**Table 21: Preliminary Impacts and Mitigation Measures**

Environmental Aspect	Preliminary Impacts	Project Phase	Mitigation Measures	Proposed Method of Investigation
<p><b>Biodiversity (Fauna and Flora)</b></p>	<p>A Terrestrial Biodiversity SSV has been undertaken during the Scoping phase. Preliminary impacts as identified by the EAP have been listed below:</p> <ul style="list-style-type: none"> <li>• Flora and faunal habitat loss and fragmentation due to the Proposed Development requiring large areas of land. Specifically, loss of the natural bushveld vegetation and plant SCC in an ESA.</li> <li>• Impacts on ESA and broadscale ecological processes.</li> <li>• Soil erosion, compaction, and disturbance to vegetation, particularly if heavy machinery is used.</li> <li>• Proliferation of alien plant invasion through soil disturbance.</li> <li>• Impacts on wildlife, particularly in sensitive habitats and/ or breeding areas such as noise, and vibration.</li> <li>• Shading of areas from placement of solar panels which may affect the growth of vegetation underneath.</li> <li>• Injury and/ or death to fauna due to collisions and/ or vegetation clearance and excavations.</li> </ul>	<p>Construction, operational and decommissioning phases.</p>	<ul style="list-style-type: none"> <li>• Search and rescue of plant SCC such as <i>Aloe marlotti</i> and <i>Hypoxis hemerocallidea</i> (prior to any topsoil or vegetation removal) potentially occurring within the Project Area.</li> <li>• On-going alien vegetation management throughout the Project Area.</li> <li>• Rehabilitation of disturbed areas with suitable local indigenous vegetation.</li> <li>• Implementation of dust suppression measures.</li> <li>• Construction camps, roads, buildings and infrastructure, and stockpiles etc. must avoid sensitive areas.</li> <li>• Waste management practices are to be adhered and monitored on site.</li> <li>• Strict speed limits must be adhered to by the construction personal/ visitors on site.</li> <li>• Areas outside the development footprint should be regarded 'no-go' areas to minimise vegetation removal and habitat destruction.</li> <li>• Vehicle movement must be restricted to existing roads and tracks within the development area.</li> </ul>	<p>A detailed Terrestrial Ecological Impact Assessment which includes faunal and floral components will be undertaken by a qualified Specialist during the EIR phase to investigate the identified preliminary impacts and define specific mitigation measures.</p>

<b>Environmental Aspect</b>	<b>Preliminary Impacts</b>	<b>Project Phase</b>	<b>Mitigation Measures</b>	<b>Proposed Method of Investigation</b>
	<ul style="list-style-type: none"> <li>Highly reflective panels creating glare, thereby visually distracting or causing harm to nearby wildlife.</li> <li>General increase in anthropogenic impacts due to an increase in people into the area.</li> </ul>			
<b>Biodiversity (Avifauna)</b>	<p>A Preliminary Avifaunal SSV (Phase 1) has been undertaken during the Scoping phase. This provided an overview of the ecological context, potential impacts and red flags to development, identified alternatives, and determined the appropriate assessment regime. Preliminary impacts as identified by the Specialist have been listed below:</p> <ul style="list-style-type: none"> <li>Loss of vegetation and avifaunal habitat through the clearing of vegetation for installation of solar panels, roads, and buildings that will have an effect on the natural bushveld, terrestrial savanna species, large-bodied, ground-dwelling gamebirds, and raptors.</li> <li>Disturbance and displacement of resident bird species.</li> <li>Permanent habitat destruction and fragmentation.</li> <li>Infrastructure may create barriers to bird movement and disrupt migration patterns.</li> </ul>	Construction, operational and decommissioning phases	<p>The Specialist provided the following recommendations to inform the placement and design of the proposed infrastructure. These recommendations have already been considered in the current buildable area layout where infrastructure will be placed beyond the buffers identified.</p> <ul style="list-style-type: none"> <li>A suitable buffer for the Percy Fyfe Nature Reserve should be applied with no infrastructure being placed within a certain distance of the border of the site. As no information regarding a buffer zone is contained within the management plan for the reserve, this will need to be discussed with the conservation authorities. The Species Environmental Assessment Guidelines (SANBI, 2020) recommend that for developments that produce low intensity disturbance, such as renewable energy projects, a minimum buffer of 200 m should be applied for</li> </ul>	<p>A detailed Avifaunal Impact Assessment will be undertaken during the EIR phase by a qualified Specialist which will include sampling conducted over two seasons (phase 1 and 2) with one falling during the peak (summer) season. This will also provide a baseline against which post-construction monitoring can be compared.</p>

Environmental Aspect	Preliminary Impacts	Project Phase	Mitigation Measures	Proposed Method of Investigation
	<ul style="list-style-type: none"> <li>Collision of avifauna with reflective surfaces of solar panels leading to injury or death as birds perceive large panel arrays for waterbodies, otherwise known as the “lake effect”.</li> <li>Noise during construction and utilising associated infrastructural equipment during operation.</li> <li>Attraction of novel species through the creation of artificial nest sites and shade.</li> <li>Contamination of the environment through the use of hazardous materials from cleaning of panels.</li> </ul>		<p>species such as breeding raptors within formally proclaimed conservation areas.</p> <ul style="list-style-type: none"> <li>All drainage lines, wetlands, and dams must be avoided, including the buffer recommended by the aquatic and/or wetland specialist.</li> <li>The Project Area, i.e. south of the railway line, does appear to be the most suitable areas for placement of the proposed infrastructure.</li> </ul>	
Aquatic	<p>An Aquatic SSV has been undertaken during the Scoping phase. Preliminary impacts as identified by the Specialist have been listed below:</p> <ul style="list-style-type: none"> <li>Disturbance and possible loss of aquatic habitat within the watercourses with an increased risk of the already highly eroded streams.</li> <li>The removal of indigenous aquatic vegetation that has the potential to result in further alien vegetation infestation within the aquatic features.</li> <li>Demand for water for construction could place stress on the existing available water resources since the area is a</li> </ul>	Construction, operational and decommissioning phases	<p>The Specialist recommended that suitable buffers or setback areas adjacent to the watercourses, together with minimising the disturbance within the watercourse corridors should be implemented subsequently inform the placement and design of the proposed infrastructure. These recommendations have already been considered in the current buildable area layout where infrastructure will be placed beyond the buffers identified.</p> <ul style="list-style-type: none"> <li>The upper Leesuspruit River and its smaller tributaries as well as the Brak tributary that drains the northern extent of the Project Area are to be avoided.</li> </ul>	A detailed Aquatic Impact Assessment which will include wetland delineation will be undertaken during the EIR phase by a qualified Specialist.

Environmental Aspect	Preliminary Impacts	Project Phase	Mitigation Measures	Proposed Method of Investigation
Groundwater	<p>strategic water source area of groundwater.</p> <ul style="list-style-type: none"> <li>Inadequately designed facilities and roads could increase the erosion potential at the Project Area.</li> <li>Increased sedimentation due to erosion and risks of contamination of surface water runoff due to usage/ presence of hazardous substances.</li> <li>Alteration of surface water run-off from development activities that have the potential to result in erosion or sedimentation of the watercourses.</li> <li>Damage or loss of riparian and wetlands systems.</li> <li>Ongoing disturbance of aquatic features and associated vegetation due to maintenance activities.</li> <li>Possible increase in water consumption and potential for water quality impacts such as contamination from sewage generated on-site.</li> </ul>		<ul style="list-style-type: none"> <li>Hillslope seeps associated with the Brak Tributary should be avoided.</li> <li>No activities are to take place on the steeper slopes in the Project Area as soils adjacent to the watercourse are highly erosive.</li> <li>Adequate stormwater management measures are to be implemented to avoid concentrated flows which can result in further erosion of the watercourses.</li> <li>Erosion along roads and construction site to be continually monitored and repaired, especially after heavy rain downpours.</li> <li>It is recommended that reshaping and rehabilitation of the watercourse corridors by revegetating with suitable indigenous vegetation and removal of invasive alien species to reduce the erosion potential take place to some extent.</li> </ul> <p>The Specialist has noted that the impact of the Proposed Development would be low and unlikely to impact the integrity of the aquatic ecosystems should buffers be applied and disturbance within watercourse corridors are minimised.</p>	
	A Geohydrological investigation from a desktop level has been undertaken during the Scoping	Construction, operational and	<ul style="list-style-type: none"> <li>The construction and the operation of the Proposed Development must be undertaken following the best practice to</li> </ul>	A Geohydrological Impact Assessment will be undertaken

<b>Environmental Aspect</b>	<b>Preliminary Impacts</b>	<b>Project Phase</b>	<b>Mitigation Measures</b>	<b>Proposed Method of Investigation</b>
	<p>phase. Preliminary impacts as identified by the EAP have been listed below:</p> <ul style="list-style-type: none"> <li>Accidental spillage or leaks of hazardous substances contained in solar PV panels such as cadmium, lead, and mercury during installation or maintenance, or spillage of hydrocarbons utilised on site during construction that may lead to contamination of productive aquifers and subsequently pose a threat to human health.</li> <li>Excavation and soil disturbance during construction could affect groundwater quality by increasing the risk of pollutants such as sediment, nutrients, and salts leaching into the water table.</li> <li>Alteration of the hydrological regime and reduction in groundwater recharge impacting on the sustainability of groundwater resources.</li> </ul>	decommissioning phases	<p>avoid pollution of the important productive aquifer of the area.</p> <ul style="list-style-type: none"> <li>Oil and hydrocarbon spillages need to be actively managed on site, by undertaking routine inspections and service of the construction vehicles, placing eco mats underneath leaking vehicles to absorb any spillages and by removing soil containing spillages for disposal as a hazardous waste. Drip trays must be put underneath stationary vehicles to avoid soil contamination.</li> <li>Development and implementation of a stormwater management plan on site.</li> </ul> <p>The Specialist has noted that the Proposed Development is envisaged to have a limited impact in terms of recharge diversion and reduction. If the contaminant release in the Project Area during construction and operation of the project is controlled to a minimum, the sensitivity of the site from a geohydrological perspective to the Proposed Development is limited.</p>	<p>during the EIR phase by a qualified Specialist to investigate in detail the identified preliminary impacts and define specific mitigation measures.</p>
<b>Landscape and Visual</b>	<p>A baseline landscape and visual investigation has been undertaken during the Scoping phase. Preliminary impacts as identified by the Specialist have been listed below:</p>	Construction, operational and decommissioning phases	<ul style="list-style-type: none"> <li>Locate access routes and construction camps so as to limit modification to the topography and to avoid the removal of established vegetation.</li> </ul>	<p>A detailed Landscape and Visual Impact Assessment which will include glint and glare will be</p>

<b>Environmental Aspect</b>	<b>Preliminary Impacts</b>	<b>Project Phase</b>	<b>Mitigation Measures</b>	<b>Proposed Method of Investigation</b>
	<ul style="list-style-type: none"> <li>• Landscape change –               <ul style="list-style-type: none"> <li>○ General degradation of the local landscape;</li> <li>○ Increase in industry and loss of natural landscape.</li> </ul> </li> <li>• Visual Impact from the Main Roads –               <ul style="list-style-type: none"> <li>○ Degradation of views from the N1 in proximity to the proposed site;</li> <li>○ Loss of views of natural landscape.</li> </ul> </li> <li>• Visual Impacts on Local Roads –               <ul style="list-style-type: none"> <li>○ Degradation of the local landscape as viewed from adjacent local roads;</li> <li>○ Industrialisation of views from local roads.</li> </ul> </li> <li>• Impacts on Homesteads –               <ul style="list-style-type: none"> <li>○ Degradation of the local landscape as viewed from homesteads.</li> </ul> </li> <li>• Protected Areas –               <ul style="list-style-type: none"> <li>○ Degradation of views from the Percy Fyfe Nature Reserve;</li> <li>○ Possible reflection from solar panels.</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>• Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitivity visual receptors.</li> <li>• Screen the construction camp and lay-down yards by enclosing the area with a dark green or black shade cloth of no less than 2 m in height.</li> <li>• Risk may be reduced further through ensuring that development is kept off the ridgeline.</li> <li>• Risk of reflection may be reduced through the use of a tracking system and an anti-glare coating on panel faces.</li> </ul>	undertaken during the EIR phase by a qualified Specialist and preliminary impacts will be further investigated.
<b>Noise</b>	The Proposed Development may generate noise, which can impact the surrounding environment and nearby communities.	Construction, operational and decommissioning phases	<ul style="list-style-type: none"> <li>• Stationary noisy equipment should be encapsulated in acoustic covers, screens or sheds.</li> </ul>	No significant noise impacts are envisaged. As such, no Specialist Study

<b>Environmental Aspect</b>	<b>Preliminary Impacts</b>	<b>Project Phase</b>	<b>Mitigation Measures</b>	<b>Proposed Method of Investigation</b>
	<p>Preliminary impacts as identified by the EAP have been listed below:</p> <ul style="list-style-type: none"> <li>• Installation of the facility involves heavy machinery and construction vehicles thus generating high levels of noise and subsequently disrupting nearby communities and/ or wildlife habitats.</li> <li>• Inverters and transformers producing low-frequency noise can potentially affect the quality of life of nearby residents and wildlife.</li> </ul>		<ul style="list-style-type: none"> <li>• Noise levels should be in accordance with relevant legislation.</li> <li>• Vehicles should not be allowed to idle for long periods when not in use.</li> <li>• Rigorous speed control to reduce the noise from vehicle traffic onsite must be implemented. It is recommended maximum speed of 30 km/h to be set on all construction roads.</li> </ul>	<p>will be undertaken. A general assessment of impacts based on available information through other studies conducted in the area will be undertaken by the EAP.</p>
<b>Air Quality</b>	<p>Preliminary impacts as identified by the EAP have been listed below:</p> <ul style="list-style-type: none"> <li>• Generation of dust, particulate matter, and other air pollutants resulting from excavation, earthworks, and transportation of materials and equipment to and from the Project Area.</li> <li>• Emissions generated from the operation of the facilities through the use of backup generators, inverters, and other equipment.</li> <li>• Conversion of agricultural land into industrial use leading to reduced air quality by altering the natural balance of ecosystems and increasing the risk of soil erosion.</li> </ul>	<p>Construction, operational and decommissioning phases</p>	<ul style="list-style-type: none"> <li>• Rigorous speed control to reduce the dust emission from vehicle traffic onsite must be implemented. It is recommended maximum speed of 30 km/h to be set on all construction roads.</li> <li>• Dust suppression measures should be employed.</li> </ul>	<p>No significant impacts are anticipated with regards to air emissions from the Proposed Development. As such, no Specialist Study will be undertaken. A general assessment of impacts based on available information through other studies conducted in the area will be undertaken by the EAP.</p>

Environmental Aspect	Preliminary Impacts	Project Phase	Mitigation Measures	Proposed Method of Investigation
<p align="center"><b>Traffic</b></p>	<p>Preliminary impacts as identified by the EAP have been listed below:</p> <ul style="list-style-type: none"> <li>Increased traffic volume on local roads and highways due to the transportation of staff, materials and equipment to the site leading to congestion and delays for commuters and residents in the area.</li> <li>Noise and dust pollution associated with potential traffic.</li> <li>Increased presence of construction vehicles and heavy equipment on local roads and highways can pose safety concerns for motorists, pedestrians, and cyclists. The movement of oversized loads and construction equipment may require temporary road closures or traffic diversions.</li> <li>Damage to local roads and highways due to transportation of heavy equipment.</li> </ul>	<p align="center">Construction, operational and decommissioning phases</p>	<ul style="list-style-type: none"> <li>The delivery of components to the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.</li> <li>Dust suppression of gravel roads located within the site boundary, including the main access road to the site and the site access roads, during the construction phase.</li> <li>Regular maintenance of gravel roads located within the site boundary, including the access roads to the site.</li> <li>The use of mobile batch plants and quarries near the site would decrease the traffic impact on the surrounding road network, if available and feasible.</li> <li>Staff and general trips should occur outside of peak traffic periods as far as possible.</li> <li>The Contractor is to ensure that all drivers entering the site adhere to the traffic laws.</li> <li>Vehicular movements within the site boundary are the responsibility of the respective Contractor and the Contractor must ensure that all construction road traffic signs and road markings (where applicable) are in place.</li> <li>If required, low hanging overhead lines (lower than 5.1m) e.g., Eskom and Telkom lines, along the proposed routes will have</li> </ul>	<p>A detailed Transport Impact Assessment will be undertaken during the EIR phase by a qualified Specialist to investigate the identified preliminary impacts and will provide more details regarding the capacity of the existing road network to accommodate increased traffic.</p>



Environmental Aspect	Preliminary Impacts	Project Phase	Mitigation Measures	Proposed Method of Investigation
			<p>to be moved to accommodate the abnormal load vehicles, if any</p> <ul style="list-style-type: none"> <li>• The haulage company is to provide evidence to the Contractor and the Developer that any affected overhead lines have been moved or raised.</li> <li>• The preferred route should be surveyed by the developer to identify problem areas (e.g., intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, which may require modification). After the road modifications have been implemented, it is recommended to undertake a “dry-run” with the largest abnormal load vehicle, prior to the transportation of any components, to ensure that delivery will occur without disruptions.</li> <li>• The Contractor needs to ensure that the gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading of the construction phase and reinstated after construction is completed.</li> <li>• Design and maintenance of internal roads. The internal gravel roads will require grading with a grader to obtain a camber</li> </ul>	

<b>Environmental Aspect</b>	<b>Preliminary Impacts</b>	<b>Project Phase</b>	<b>Mitigation Measures</b>	<b>Proposed Method of Investigation</b>
			of between 3% and 4% (to facilitate drainage) and regular maintenance blading will also be required. The geometric design of these gravel roads needs to be confirmed at detailed design stage.	
<b>Cultural and Heritage</b>	<p>A heritage investigation from a desktop level has been undertaken during the Scoping phase. Preliminary impacts as identified by the EAP have been listed below:</p> <ul style="list-style-type: none"> <li>Disturbance or destruction of cultural heritage sites, such as archaeological sites or traditional cultural landscapes resulting in the loss of cultural heritage and historical information.</li> <li>Impact the landscape and scenic values of the area affecting the aesthetic and cultural values of an area, including the enjoyment of the natural environment by local communities and tourists.</li> </ul>	Construction and operational phases.	<ul style="list-style-type: none"> <li>Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place.</li> <li>Under no circumstances may any archaeological, historical or any physical cultural property heritage material be destroyed or removed from site.</li> <li>A Chance Finds Procedure is to be defined and implemented should heritage artefacts be encountered.</li> </ul>	<p>A Phase 1 Heritage Impact Assessment will be undertaken during the EIR phase by a suitable Specialist to investigate the identified preliminary impacts and define specific mitigation measures.</p> <p>The palaeontological sensitivity map available from the SAHRIS database indicates the site to lay within a grey (zero) and blue (low) sensitivity for the site. The Palaeontologist has confirmed that no further</p>

<b>Environmental Aspect</b>	<b>Preliminary Impacts</b>	<b>Project Phase</b>	<b>Mitigation Measures</b>	<b>Proposed Method of Investigation</b>
				palaeontological assessment will be required for the survey footprints.
<b>Waste Generation</b>	<p>Preliminary impacts as identified by the EAP have been listed below:</p> <ul style="list-style-type: none"> <li>Inadequate handling and disposal of waste (general and hazardous) such as contaminated soil, oil cans, oily rags concrete, and packaging materials generated during construction may affect local biodiversity.</li> <li>At the end of life, solar PV panels and BESS will need to be disposed of or recycled, which can potentially generate waste and require appropriate management.</li> </ul>	Construction, operational and decommissioning phases	<ul style="list-style-type: none"> <li>Waste management practices are to be implemented on site and the waste management hierarchy followed as far as practically possible.</li> <li>All waste generated is to be disposed at registered waste facilities.</li> </ul>	Investigation of waste impacts will involve a general assessment based on available information provided in various Specialist Studies as well as through the knowledge of the EAP. Requirements will be aligned to the relevant legislation.
<b>Socio-Economic</b>	<p>There is a potential for socio-economic impacts to affect surrounding communities, both positively and negatively. Preliminary impacts as identified by the EAP and Specialist have been listed below:</p> <ul style="list-style-type: none"> <li>Temporary stimulation of the provincial economy and growth in the regional Gross Value Added.</li> <li>Job creation in areas such as engineering, installation, maintenance, and</li> </ul>	Construction, operational and decommissioning phases	<ul style="list-style-type: none"> <li>The construction process may involve the procurement of various goods and services, such as construction materials, equipment, and supplies. Local businesses and suppliers could benefit from these procurement needs, stimulating economic activity and fostering local entrepreneurship.</li> <li>Employment opportunities and criteria should be communicated to the community before being advertised outside the municipal area.</li> </ul>	A detailed Socio-Economic Impact Assessment will be undertaken during the EIR phase by a qualified Specialist to investigate the identified preliminary impacts and define specific mitigation measures.

Environmental Aspect	Preliminary Impacts	Project Phase	Mitigation Measures	Proposed Method of Investigation
	<p>management, which can contribute to local economic development.</p> <ul style="list-style-type: none"> <li>• The Proposed Development can bring economic benefits to the local community, such as increased tax revenue and business opportunities for local suppliers and contractors.</li> <li>• Negative temporary change to the sense of place during construction. This can be attributed to the increased presence of people and the general construction activities taking place.</li> <li>• Temporary increase in crime and social conflicts associated with influx (or removal) of people.</li> <li>• Potential impact on the environment during construction. The construction phase poses potential risks of contamination, including water, dust, and air pollution. These contaminants can have adverse effects on the surrounding environment, potentially affecting water sources, air quality, and overall ecosystem health.</li> <li>• Disruption to communities through noise, traffic, and visual impacts, which can affect quality of life.</li> </ul>		<ul style="list-style-type: none"> <li>• Individuals who reside within the borders of the municipality must be prioritised where possible with regards to being employed during both the construction and operation phases.</li> <li>• Complaints and concerns raised by surrounding communities must be addressed promptly, and feedback must be given to complainants.</li> <li>• Environmental Impacts are expected to be confined to the local area, highlighting the need to minimize their potential consequences. To address this, maintaining or enhancing security measures around the designated site area is crucial. By doing so, any potential negative impacts can be effectively managed and mitigated. It is also important to ensure that environmental factors are contained within the boundaries of the proposed facility.</li> </ul>	

## 7.2 CUMULATIVE IMPACTS

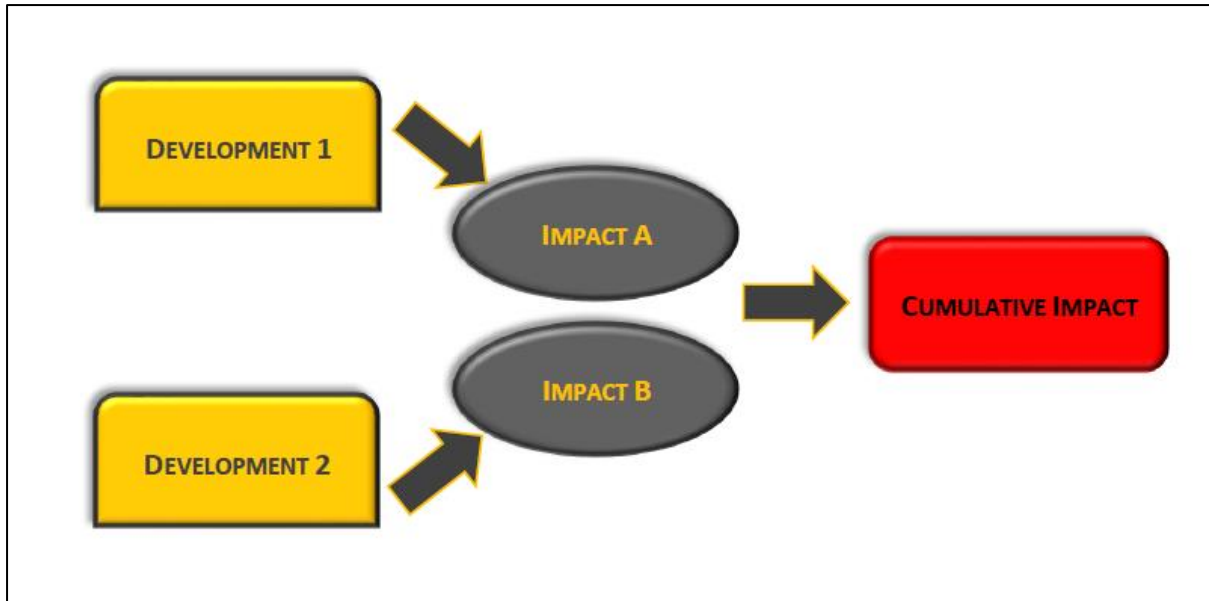
Cumulative impacts are regarded as the incremental and combined effects of human activity which pose a significant threat to the environment. Cumulative impacts can emanate from one or more activities or stressors on a particular environment over time. Assessing cumulative impacts requires considering both the direct and indirect effects, as well as the interactions and interdependencies between different factors. These effects/impacts result from the interaction and accumulation of various individual impacts, which can have additive, antagonistic, compounding, or synergistic effects.

A cumulative impact may result in an additive impact (i.e., where the effects of certain actions sum up to the overall impact/consequence which is caused by other alike impacts over time). Simply put, an additive impact is whereby the total cumulative impact is equal to the sum of the individual impacts. On the other hand, an interactive impact is where a cumulative impact is produced by the combined effects of different impacts that form a new type of impact. Interactive impacts may have an antagonistic effect (i.e., the overall negative cumulative impact is less than the sum of the individual impacts) or a compounding/synergistic effect (i.e., the overall negative cumulative impact is greater than the sum of the individual impacts). Whilst both compounding impacts and synergistic effects incorporate combining multiple factors or actions to produce a greater effect, they are different. For instance, compounding impacts emphasise on the cumulative amplification of the overall impact considering the combined effect of several factors/action, while synergistic effects focus on the enhanced outcome resulting from the interaction of two or more elements.

Assessing and mitigating interactive cumulative impacts typically involves comprehensive planning, impact assessments, stakeholder engagement, and adaptive management strategies. The goal is to identify and minimise negative cumulative impacts while maximising positive ones, promoting sustainable development and long-term well-being. By considering cumulative impacts, policymakers, planners, and stakeholders can make more informed decisions and take proactive measures to mitigate or manage the combined effects of various activities or changes.

Assessing cumulative impacts on a study area is complex considering the interactions and interdependencies between different factors, in addition to the consideration of multiple impacts that occur on a much larger and extensive scale than the Project Area being assessed and evaluated. Often it is challenging to ascertain the precise point whereby the combined effect of several small individual impacts become an unfavourable or unexpected cumulative impact that should be avoided or mitigated. On numerous occasions, there are individual factors that are unpredictable when potential cumulative impacts are identified.

Potential cumulative impacts will also be identified and assessed by considering the combined effects of gradual changes or impacts caused by other activities from other neighbouring developments in conjunction with the Proposed Development (as illustrated in **Figure 13** below). More specifically, when observed as a whole, multiple developments with insignificant/low individual impacts may create a greater cumulative negative impact on the environment.



**Figure 13: Illustration of Cumulative Impacts**

The indicated degree of confidence (i.e., low, medium, or high) in the predictions made for each impact, is determined and reported according to the available information, as well as the Specialists’ or EAP’s level of knowledge and expertise. It should be noted that the degree of confidence will not be taken into consideration whilst determining the consequence or probability.

Therefore, the assessment for the Proposed Development will originally be undertaken for the circumstance where no mitigation measures are implemented. Appropriate mitigation measures will then be identified and considered for each impact and the assessment repeated in order to determine the significance of the residual impacts (i.e., the impact remaining after the mitigation measure has been implemented). The outcome of the assessment of the significance of the identified residual impacts will then supplement decision-making by authorities.

It is important to note that there are four (4) additional developers within 30 km of the Project Area who have been issued with Environmental Authorisations for similar facilities (refer to **Table 22**). As a result, the cumulative impact of all facilities on the receiving environment would be a key part of the EIR investigations.

**Table 22: Solar developments with an approved Environmental Authorisation within 30 km of the proposed project areas.**

No	EIA Reference No	Classification	Status of application	Capacity (MW)	Distance from proposed area (km)
1	14/12/16/3/3/1/634	Solar PV	Approved	10	24.1
2	12/12/20/2153	Solar PV	Approved	30	13.9
3	12/12/20/2352	Solar PV	Approved	8	26.5
4	14/12/16/3/3/2/1049	Solar PV	Approved	90	24.9

**7.2.1 KEY IMPACTS IDENTIFIED THAT COULD RESULT IN CUMULATIVE IMPACTS**

The following cumulative impacts have been identified by the EAP during the Scoping phase which will require further investigation during the EIR phase by the relevant Specialists.

**Table 23: Potential Cumulative Impacts**

<b>Environmental Aspect</b>	<b>Potential Cumulative Impact</b>	<b>Detailed Description</b>
<b>Terrestrial Biodiversity (Fauna and Flora)</b>	Loss and fragmentation of faunal and floral habitats leading to ecological imbalances and impacts on ecosystem services.	The construction of several solar PV projects within 30 km of each other and associated infrastructure, such as access roads, transmission lines, and substations, can fragment habitats and disrupt wildlife corridors. This can limit the ability of wildlife to move between different areas, which can have negative impacts on breeding, feeding, and other important life functions.
<b>Terrestrial Biodiversity (Avifauna)</b>	<p>Increased human disturbance and gradual environmental degradation adding to cumulative pressures in the landscape caused by other approved or proposed renewable energy projects.</p> <p>Solar panels can reflect light, creating a glare that can disorient birds and other animals during migration.</p>	This impact is exacerbated with several farms within a 30 km radius of each other.
<b>Aquatic Ecosystems</b>	<p>Loss of open space and hardening of catchment areas for the construction of buildings, PV arrays and roads.</p> <p>The development of road crossings can cause fragmentation of inland aquatic ecosystems by impeding or obstructing the natural flow of water down to rivers and wetlands, which alters the hydrology and can lead to changes in these ecosystems.</p> <p>Increase in demand for water in areas where water may be limited.</p>	Solar PV projects require water for their operation, primarily for cleaning and maintenance of solar panels. The water use can be significant, particularly for larger solar PV projects. In areas where water is already limited, the water use of solar PV projects can further strain water resources and impact local water availability. Additionally, the conversion of agricultural or natural land to industrial land use for solar PV projects can affect the natural water cycle in the region. This is because the vegetation and soil in natural and agricultural land act as natural water filters and regulators, which can help retain water in the ground and replenish aquifers. The conversion of land to industrial use for solar PV projects can alter the natural water cycle and reduce water infiltration and recharge, which can

<b>Environmental Aspect</b>	<b>Potential Cumulative Impact</b>	<b>Detailed Description</b>
		impact local water availability. Multiple solar projects in a 30 km radius exacerbates these impacts.
<b>Visual</b>	Visual impacts on the landscape and scenic views, affecting the aesthetic and cultural values of the surrounding area.	<p>The construction of multiple solar PV projects within a 30 km radius can result in significant land use changes, including the conversion of agricultural or natural land to industrial land use. This can impact the availability of land for other uses such as conservation.</p> <p>Multiple solar PV projects in close proximity can have a cumulative visual impact on the landscape, altering the natural aesthetics of the area. This can impact the scenic value of the area and potentially reduce property values.</p>
<b>Dust</b>	Dust generated from construction activities.	During the construction of a solar PV facility, dust can be generated from grading, excavation, digging foundations, and transporting materials. If multiple solar PV facilities are simultaneously under construction within a 30 km radius, the cumulative impact of dust generated from construction activities can potentially become a concern.
<b>Traffic</b>	Increased traffic on local roads during the construction phase potentially leading to congestion, road safety issues, and road degradation.	There may be an increase in traffic due to the transportation of materials, equipment, and workers to and from the construction site. This impact is exacerbated with the development of several solar farms within a 30 km radius.

In addition to the above, the EAP has also identified all the Solar developments with an approved Environmental Authorisation within 30 km of the proposed project areas. Please refer to **Table 22** above. The cumulative impacts of these facilities and their associated electrical infrastructure such as overhead lines will be assessed with the Proposed Development to determine the cumulative environmental Impact.

### **7.3 No-Go IMPACTS**

If the Proposed Development is not approved, all of the preliminary impacts (positive or negative) identified in the preceding section during the construction and operational phases will not occur. It is worth noting that this includes the socio-economic benefits associated with the Proposed Development, which are the main positive impacts, and which will not be realised if the project is not approved. These include the following:



- Since solar energy is a clean and renewable source of energy, it can help to reduce South Africa's dependence on fossil fuels and decrease GHG emissions, thus contributing to the country's efforts to mitigate climate change.
- Solar PV facilities can provide electricity to areas that are not connected to the national grid, thereby increasing access to electricity and improving the quality of life for people living in those areas especially with recurrent loadshedding taking place.
- Development results in employment opportunities during the construction, operation and maintenance of the facility thereby having a positive impact on local economies and communities.
- Attraction of investment and stimulation of economic growth in the renewable energy sector, which can contribute to the country's overall economic development.

The impacts associated with the no-go alternative will be assessed in more detail during the EIR phase and its feasibility compared to the development alternative.

## 8. SCOPING PHASE: PUBLIC PARTICIPATION PROCESS

Public consultation is a legal requirement conducted throughout the S&EIR process. The DSR documents details the PPP tasks that have been undertaken as part of the Scoping Phase. The DSR and associated documents will be made available for public review and comment for a period of 30 days (**Wednesday, 13 September to Monday, 16 October 2023**). The method of public consultation used depended largely on the location of the development and the level of education of those being impacted on by the project.

Required means of public consultation include:

- Site notices.
- Public Notification Advertisements were published in English and Setswana in the local Newspaper (Bosveld Revie and Polokwane Review).
- Emails providing notification and background information will be sent to affected landowner(s), stakeholders and registered I&APs.
- On-going authority and Stakeholder engagement (DFFE, DWS, SAHRA, etc.) throughout the Scoping process.

The PPP undertaken as part of the Scoping Phase are outlined in the following sub-sections.

### 8.1 NEWSPAPER ADVERTISEMENT

Newspaper adverts in English and Sepedi were placed in the Polokwane Review (distributed in Polokwane) on **Wednesday, 13 September 2023** and Bosveld Review (distributed in Mokopane) on **Thursday, 14 September 2023**. Please see **Appendix C2**.

### 8.2 ONSITE NOTICES

A total of eight (8) onsite notice boards (4x English and 4x Sepedi) were erected at the Site Entrance and at key intersections near the Project Area on **Tuesday, 12 September 2023**, please see **Appendix C4**.

### 8.3 INTERESTED AND AFFECTED PARTIES (I&APs) IDENTIFICATION AND NOTIFICATION

An initial I&AP database has been compiled by the EAP. Stakeholders which are likely to be affected by the Proposed Development have been included in the initial I&AP Database. I&APs include relevant organisations and State Departments, landowners, and adjacent landowners/occupiers (as required by the EIA Regulations) as well as parties identified based on their potential interest in the project. In addition, individuals who contact Praxos for information on the Proposed Development, due to notification by means of the onsite signage, the advertisement or word-of-mouth, etc. will be registered on the I&AP Database. The I&AP database is considered a live document and names will be added and/removed based on the consultation process (please see **Appendix C1**).

The registered I&APs were provided with a notification letter of introduction to the project via email on **Tuesday, 12 September 2023**. These documents included the contact details of the EAP and a summary of background information on the Proposed Development.

All I&APs were invited to comment on the DSR through written notification (through e-mail). Please refer to **Appendix C3**.

Please note that due to the Protection of Personal Information Act (Act No. 4 of 2013), only farm names and stakeholder names are visible on the I&AP database presented in **Appendix C1**. No personal information will be shared but the complete database inclusive of contact information will be submitted to the DFFE along with the DSR.

## 8.4 PUBLIC REVIEW AND SUBMISSION OF REPORTS

### 8.4.1 *RELEASE OF THE DRAFT SCOPING REPORT FOR AUTHORITY, STAKEHOLDER AND PUBLIC REVIEW.*

All I&APs included in the Register of I&APs, have been notified in writing of the availability of the DSR for public review. The notification letter provides details of the 30-day public comment period (currently underway), the venues and websites where the report could be viewed, the contact details of the PPP consultant and how written comments on the DSR should be submitted (as outlined below).

The DSR is available for public review from the **Wednesday, 13 September to Monday, 16 October 2023** (30 days, exclusive of public holidays).

- Hard copies of the DSR are available at:
  - (a) Polokwane City Library, 71 Hans Van Rensburg Street & Corner Jorissen Street, Polokwane, 0700.
  - (b) Mogalakwena Public Library (Mokopane), Corner of Van Riebeeck Street & Ruiters Road.
- Soft copies are available on the following dropbox link below:  
<https://www.dropbox.com/sh/ivtm41ci5fuwm7h/AAAD4H0pdt3zeq0EihZy7jKha?dl=0>.
- Options for a USB copy are available upon request through contacting Richard Myburgh at the Public Participation Office at [publicparticipation@praxos373.co.za](mailto:publicparticipation@praxos373.co.za) or 011 453 8727.

### 8.4.2 *SUBMISSION OF THE FINAL SCOPING REPORT*

The FSR will be compiled in accordance with the comments received during the public review of the DSR and will include a CRR. The CRR will be a live and continuously updated report which details all comments received and the responses thereto.

## 9. PLAN OF STUDY: ENVIRONMENTAL IMPACT ASSESSMENT PHASE

The EIR phase is the second phase of the project, which is aimed at assessing the significance of the environmental impacts of the Proposed Development. The Scoping phase of the environmental process determined that more information on certain aspects of the development is required. As a follow up to the Scoping phase, a comprehensive EIR will be undertaken.

In accordance with the application procedure of the NEMA and the EIA Regulations, a number of potential environmental impacts (biophysical and social) were identified during the Scoping phase (as outlined in **Chapter 7** of this DSR). All potentially significant and cumulative impacts will be investigated and assessed within the EIR phase of the project by the EAP and through Specialist Studies. This PoS for the EIR outlines the procedure to be followed and methods to be employed in investigating and assessing all the issues identified in the Scoping phase.

The PoS for EIR is based on the findings and recommendations of the Scoping Report and the related process. Mitigation measures recommended in the EIR phase will also be included in the EMP, which will form part of the EIR. The PoS is set out below describing the manner in which Praxos, as the appointed EAP, will undertake the EIR phase of the S&EIR process.

### 9.1 PURPOSE OF THE PLAN OF STUDY FOR THE EIR

The PoS for the EIR phase sets out the proposed approach. The following requirements of GNR No. 982 promulgated in terms of Section 24 of NEMA have been considered in compiling this PoS:

- i) A description of the tasks that will be undertaken as part of the EIR phase, including any Specialist reports or specialised processes, and the manner in which such tasks will be undertaken.
- ii) An indication of the stages at which the CA will be consulted.
- iii) A description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity.
- iv) How comments and issues raised by the I&APs and key stakeholders during the Public Participation Process will be collected, processed and addressed in the Comments and Responses Report, which will form part of the Scoping report and EIR.
- v) Particulars of the Public Participation Process that will be conducted during the EIR process.

The PoS for EIR thus aims to:

- Describe how the EIR phase of the project will be conducted.
- Describe alternatives to be considered.
- Describe aspects to be assessed as part of the EIR process.
- Provide an indication of the stages at which the CA will be consulted. Provide particulars of the Public Participation Process that will be conducted during the EIA process.
- Provide the Terms of Reference for Specialist Studies.
- Provide the impact assessment methodology to be used to rate impacts.
- Indicate deliverables of the EIR phase and the proposed timeframe.

## 9.2 DETAILED IMPACT ASSESSMENT PHASE

### 9.2.1 INTRODUCTION

The EIR phase will aim to adequately assess all potentially significant environmental impacts in order to provide the CA with sufficient information to make an informed decision regarding the Proposed Development.

Following the acceptance of the Scoping report by the CA, the detailed EIR phase of the S&EIR process will commence. This phase considers the potential impacts identified in terms of the Proposed Development, assesses them in terms of their significance and recommends mitigation measures where necessary. The following aspects will be considered:

- i) Potential impacts during the planning and design phase.
- ii) Potential impacts during the construction phase.
- iii) Potential impacts during the operational phase.
- iv) Potential impacts during the decommissioning phase.
- v) The potential cumulative impacts of the Proposed Development.

The purpose of the Impact Assessment phase of the S&EIR process is thus to:

- i) Address issues that have been raised during the Scoping phase.
- ii) Assess alternatives to the Proposed Development in a comprehensive and comparative manner.
- iii) Assess all identified impacts and determine the significance of each impact.
- iv) Formulate mitigation measures in order to minimise negative impacts and optimise the effects of positive impacts.

Numerous acceptable approaches and methodologies exist by which the above purpose can be achieved. The legislation in South Africa, including the guideline documents published in support thereof; do not provide a specific methodology for the assessment of impacts. Rather, an assessment framework is provided within which EAPs are expected to structure a project-specific assessment methodology. This assessment framework recognises that there are different methodologies available for assessing the impact of a development but that the specific methodology selected must provide for the following:

- i) A clear process for impact identification, prediction and evaluation.
- ii) The specification of impact identification techniques.
- iii) Criteria for evaluating the significance of impacts.
- iv) The design of mitigation measures to address impacts.
- v) Defining types of impacts (direct, indirect or cumulative).
- vi) Specification of uncertainties.

### 9.2.2 IMPACT ASSESSMENT METHODOLOGY

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise from the Proposed Development. The process of assessing the potential impacts of the project encompasses the following four activities:

- i) Identification and assessment of potential impacts.
- ii) Prediction of the nature, magnitude, extent and duration of potentially significant impacts.
- iii) Identification of mitigation measures that could be implemented to reduce the severity or significance of the impacts of the activity.

- iv) Evaluation of the significance of the impact after the mitigation measures have been implemented i.e. the significance of the residual impact.

The potential impacts associated with the Proposed Development are identified in the Scoping phase through stakeholder consultation, as well as through input from the authorities and the Specialist team. These impacts are derived from the concerns that are identified in relation to all phases of the development. During the detailed EIR phase of the S&EIR process, additional impacts will be identified through the various Specialist Studies to be undertaken and through the on-going consultation process with I&APs.

In accordance with GNR 982 of the EIA Regulations, Specialists will be required to assess the significance of potential impacts in terms of the following criteria:

- i) Cumulative impacts.
- ii) Nature of the impact.
- iii) Extent of the impact.
- iv) Probability of the impact occurring.
- v) The degree to which the impact can be reversed.
- vi) The degree to which the impact may cause irreplaceable loss of resources.
- vii) The degree to which the impact can be mitigated.

**Table 24 - Table 26** provides a summary of the criteria which Praxos proposes to use, to assess the significance of the potential impacts identified. An explanation of these impact criteria is provided below.

**Table 24: Proposed Criteria and Rating Scales to be used in the Assessment of the Potential Impacts**

<b>Criteria</b>	<b>Rating Scales</b>	<b>Notes</b>
<b>Nature</b>	Positive	An evaluation of the effect of the impact related to the Proposed Development.
	Negative	
<b>Duration</b>	Temporary	The duration of the activity associated with the impact will last 0-6 months and as such is rated as Temporary.
	Short term	The duration of the activity associated with the impact will last 6-18 months and as such is rated as short term.
	Medium term	The duration of the activity associated with the impact will last 18 months-5 years and as such is rated as medium term.
	Long term	The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term.
<b>Extent</b>	Footprint	The extent of the impact is rated as footprint as it only affects the area in which the Proposed Development will occur.
	Site	The extent of the impact is rated as site as it will affect only the development area.
	Local	The extent of the impact is rated as Local as it affects the development area and adjacent properties.
	Regional	The extent of the impact is rated as Regional as the effects of the impact extends beyond municipal boundaries.

<b>Criteria</b>	<b>Rating Scales</b>	<b>Notes</b>
	National	The extent of the impact is rated as National as the effects of the impact extends beyond more than 2 regional/provincial boundaries.
	International	The extent of the impact is rated as International as the effect of the impact extends beyond country borders.
<b>Potential for impact on irreplaceable resources</b>	No	No irreplaceable resources will be impacted.
	Yes	Irreplaceable resources will be impacted.
<b>Severity</b>	High negative	The severity of the impact is rated as High negative when the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.
	Moderate negative	The severity of the impact is rated as Moderate negative when the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected.
	Low negative	The severity of the impact is rated as Low negative when the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected.
	Low positive	The severity of the impact is rated as Low positive when the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally improved.
	Moderate positive	The severity of the impact is rated as Moderate positive when the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are positively affected.
	High positive	The severity of the impact is rated as High positive when the natural, cultural or social functions and processes are altered to the extent that valued, important, sensitive or vulnerable systems or communities are substantially positively affected.
	<b>Consequence</b>	Extremely detrimental
Highly detrimental		
Moderately detrimental		
Slightly detrimental		
Negligible		



Criteria	Rating Scales	Notes
	Slightly beneficial	
	Moderately beneficial	
	Highly beneficial	
	Extremely beneficial	
Likelihood of the impact occurring	Unlikely	It is highly unlikely or less than 50% likely that an impact will occur.
	Likely	It is between 50% and 75% certain that the impact will occur.
	Definite	It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.
Significance	Very high – negative	A function of Consequence and Likelihood.
	High – negative	
	Moderate – negative	
	Low – negative	
	Very low	
	Low – positive	
	Moderate – positive	
	High – positive	
	Very high – positive	

**Table 25: Explanation of Assessment Criteria**

Criteria	Explanation
Nature	This is an evaluation of the type of effect the construction, operation and management of the Proposed Development would have on the affected environment. This will determine if the impact change in the environment will be positive, negative or neutral.
Extent or Scale	This refers to the spatial scale at which the impact will occur. Extent of the impact is described as: footprint (affecting only the footprint of the development), site (limited to the site) and regional (limited to the immediate surroundings and closest towns to the site). Extent or scale refers to the actual physical footprint of the impact, not to the spatial significance. It is acknowledged that some impacts, even though they may be of small extent, are of very high importance, e.g., impacts on species of very restricted range. In order to avoid “double counting, Specialists have been requested to indicate spatial significance under “intensity” or “impact on irreplaceable resources” but not under “extent” as well.
Duration	The lifespan of the impact is indicated as temporary, short, medium and long term.
Severity	This is a relative evaluation within the context of all the activities and the

<b>Criteria</b>	<b>Explanation</b>
	other impacts within the framework of the project. Does the activity destroy the impacted environment, alter its functioning, or render it slightly altered.
<b>Impact on irreplaceable resources</b>	This refers to the potential for an environmental resource to be replaced, should it be impacted. A resource could possibly be replaced by natural processes (e.g., by natural colonisation from surrounding areas), through artificial means (e.g., by reseeding disturbed areas or replanting rescued species) or by providing a substitute resource, in certain cases. In natural systems, providing substitute resources is usually not possible, but in social systems substitutes are often possible (e.g., by constructing new social facilities for those that are lost). Should it not be possible to replace a resource, the resource is essentially irreplaceable e.g., red data species that are restricted to a particular site or habitat of very limited extent.
<b>Consequence</b>	The consequence of the potential impacts is a summation of above criteria, namely the extent, duration, intensity and impact on irreplaceable resources.
<b>Probability of occurrence</b>	The probability of the impact actually occurring based on professional experience of the Specialist with environments of a similar nature to the site and/or with similar projects. It is important to distinguish between probability of the impact occurring and probability that the activity causing a potential impact will occur. Probability is defined as the probability of the impact occurring, not as the probability of the activities that may result in the impact.
<b>Significance</b>	<p>Impact significance is defined to be a combination of the consequence (as described below) and probability of the impact occurring. The relationship between consequence and probability highlights that the risk (or impact significance) must be evaluated in terms of the seriousness (consequence) of the impact, weighted by the probability of the impact actually occurring.</p> <p>In simple terms, if the consequence and probability of an impact is high, then the impact will have a high significance. The significance defines the level to which the impact will influence the Proposed Development and/or environment. It determines whether mitigation measures need to be identified and implemented and whether the impact is important for decision-making.</p>
<b>Degree of confidence in predictions</b>	Specialists and the EIR team were required to provide an indication of the degree of confidence (low, medium or high) that there is in the predictions made for each impact, based on the available information and their level of knowledge and expertise. Degree of confidence is not taken into account in the determination of consequence or probability.
<b>Mitigation measures</b>	Mitigation measures are designed to reduce the consequence or probability of an impact, or to reduce both consequence and probability. The significance of impacts has been assessed both with mitigation and without mitigation.

Table 26: Impact assessment criteria and rating scales

Duration		Extent		Irreplaceable Resources		Severity		Consequence = (Duration + Extent + Irr R) x Severity		Likelihood		Significance		Confidence
1	Temporary	1	Footprint	1	Yes	-3	High negative	-25 to -33	Extremely detrimental	1	Unlikely	-73 to -99	Very high negative	Low
2	Short term	2	Site	0	No	-2	Moderate negative	-19 to -24	Highly detrimental	2	Likely	-55 to -72	High negative	Medium
3	Medium term	3	Local			-1	Low -negative	-13 to -18	Moderately detrimental	3	Definite	-37 to -54	Moderate negative	High
4	Long term	4	Regional					-7 to -12	Slightly detrimental			-19 to -36	Low negative	
		5	National			1	Low -positive	0 to -6	Negligible			0 to -18	Very low negative	
		6	International			2	Moderate positive							
						3	High positive	0 to 6	Negligible			0 to 18	Very Low positive	
								7 to 12	Slightly beneficial			19 to 36	Low – positive	
								13 to 18	Moderately beneficial			37 to 54	Moderate positive	
								19 to 24	Highly beneficial			55 to 72	High positive	
								25 to 33	Extremely beneficial			73 to 99	Very high positive	

### 9.2.3 ASCRIBING SIGNIFICANCE FOR DECISION-MAKING

The best way of expressing the environmental costs/impacts and the inherent benefit implications for decision-making is to present them as risks. Risk is defined as the consequence (implication) of an event multiplied by the probability (likelihood)<sup>10</sup> of that event. Many risks are accepted or tolerated daily because even if the consequence of the event is serious, the likelihood that the event will occur is low. A practical example is the consequence of a lightning strike, while potentially deadly, the likelihood of such an event happening is very low. The risk is low because the likelihood of the consequence is low even if the consequence is potentially severe.

It is also necessary to distinguish between the event itself (as the cause) and the consequence. Again, using a lightning strike as an example, the consequence of concern in the event that lightning strikes is serious injury or death, but it does not necessarily follow that if a person is struck by lightning that the person will die.

Various contingencies are provided to minimise the likelihood of the consequence (serious injury or death) in the event of a lightning strike, such as proper grounding or insulation. In risk terms this means distinguishing between the inherent risk (the risk that a person will die if lightning strikes) and the residual risk (the risk that the person will die if struck by lightning but with the contingency of being insulated) i.e., the risk before and after mitigation.

### 9.2.4 CONSEQUENCE

The ascription of significance for decision-making becomes then relatively simple. It requires the consequences to be ranked and likelihood to be defined of that consequence. In **Table 26**, a scoring system for consequence ranking is shown. Two important features should be noted in this table, namely that the scoring doubles as the risk increases and that there is no equivalent 'high' score in respect of benefits as there is for the costs. This high negative score serves to give expression to the potential for a fatal flaw where a fatal flaw would be defined as an impact that cannot be mitigated effectively and where the associated risk is accordingly untenable. Stated differently, the high score on the costs, which is not matched on the benefits side, highlights that such a fatal flaw cannot be 'traded off' by a benefit and would render the Proposed Development to be unacceptable. **Table 27** below explains the ranking of consequence.

**Table 27: Ranking of Consequence**

<b>Environmental Cost</b>	<b>Inherent Risk</b>
Human health - morbidity / mortality, loss of species.	High
Material reductions in faunal populations, loss of livelihoods, individual economic loss.	Moderate - high
Material reductions in environmental quality - air, soil, water. Loss of habitat, loss of heritage, amenity.	Moderate
Nuisance.	Moderate - low
Negative change - with no other consequences.	Low

<sup>10</sup> Because 'probability' has a specific mathematical/empirical connotation the term 'likelihood' is preferred in a qualitative application and is accordingly the term used in this document.

<b>Environmental Benefits</b>	<b>Inherent Benefit</b>
Net improvement in human welfare.	Moderate - high
Improved environmental quality - air, soil, water. Improved individual livelihoods.	Moderate
Economic Development.	Moderate - Low
Positive change - with no other consequences.	Low

### **9.2.5 LIKELIHOOD**

Although the principle is one of probability, the term ‘likelihood’ is used to give expression to a qualitative rather than quantitative assessment, because the term ‘probability’ tends to denote a mathematical/empirical expression. A set of likelihood descriptors that can be used to characterise the likelihood of the costs and benefits occurring, is presented in **Table 28** below.

**Table 28: Likelihood Categories and Definitions**

<b>Likelihood Descriptors</b>	<b>Definitions</b>
Highly unlikely	The possibility of the consequence occurring is negligible.
Unlikely but possible	The possibility of the consequence occurring is low but cannot be discounted entirely.
Likely	The consequence may not occur but a balance of probability suggests it will.
Highly likely	The consequence may still not occur but it is most likely that it will.
Definite	The consequence will definitely occur.

It is very important to recognise that the likelihood question is asked twice. The first time the question is asked is the likelihood of the cause and the second as to the likelihood of the consequence. In the tables that follow the likelihood is presented of the cause, and then the likelihood of the consequence is presented. A high likelihood of a cause does not necessarily translate into a high likelihood of the consequence. As such the likelihood of the consequence is not a mathematical or statistical ‘average’ of the causes but rather a qualitative estimate.

### **9.2.6 RESIDUAL RISK**

The residual risk is then determined by the consequence and the likelihood of that consequence. The residual risk categories are shown in **Table 29** where consequence scoring is shown in the rows and likelihood in the columns. The implications for decision-making of the different residual risk categories are shown in **Table 30**.

**Table 29: Residual Risk Categories**

		Residual risk				
<b>Consequence</b>	<b>High</b>	Moderate	High	High	Fatally flawed	
	<b>Moderate – high</b>	Low	Moderate	High	High	High
	<b>Moderate</b>	Low	Moderate	Moderate	Moderate	Moderate
	<b>Moderate – low</b>	Low	Low	Low	Low	Moderate
	<b>Low</b>	Low	Low	Low	Low	Low
		Highly unlikely	Unlikely but possible	Likely	Highly likely	Definite
		Likelihood				

**Table 30: Implication for Decision-Making of the Different Residual Risk Categories**

Rating	Nature of implication for Decision – Making
<b>Low</b>	Project can be authorised with low risk of environmental degradation
<b>Moderate</b>	Project can be authorised but with conditions and routine inspections
<b>High</b>	Project can be authorised but with strict conditions and high levels of compliance and enforcement
<b>Fatally Flawed</b>	The project cannot be authorised

### 9.3 CONSIDERATION OF ALTERNATIVES

Various types of alternatives have been identified at the Scoping phase (refer to **Section 3**). During the EIR phase, the alternatives will be further investigated and assessed. However, it should be noted that the current layouts for the Proposed Development have been considered on the outcome of the SSV’s undertaken by the various Specialists and their recommended buffers. During the selection of the most suitable project alternatives, the following principles will be taken into consideration:

- The opinion of the public, ascertained through the PPP.
- Specialists’ recommendations.
- Environmental constraints.
- Minimal environmental impacts.
- Optimisation of existing infrastructure, such as access roads, fuel pipelines.
- Existing land-use/rights and land-ownership constraints.
- Economic cost-benefit analyses.

### 9.4 TERMS OF REFERENCE FOR SPECIALIST STUDIES

A team of Specialists will be involved in the detailed EIR phase of the process. The results of the Specialist Studies will be analysed and interpreted in order to assess the potential impacts of the Proposed Development on the Environment, devise potential alternatives with respect to select activities (if required), and develop the necessary mitigation measures in order to minimise negative impacts and optimise positive impacts. The Specialist recommendations will be incorporated in the EMPr. The activities as described in the project description will be assessed on both an individual as well as a cumulative level. A summary of the Specialist Studies and the proposed Specialist responsible for that study is provided in **Table 31** below.

**Table 31: Proposed Specialist Studies to be undertaken during the Environmental Impact Reporting Phase of the Project**

<b>Specialist Studies</b>	<b>Specialist</b>
Study 1: Agricultural Assessment	Mzansi Agriculture: J S Phipson on behalf of EnviroSaint
Study 2: Aquatic Biodiversity & Wetland Delineation Assessment	Antonia Belcher
Study 3: Archaeological & Cultural Heritage Impact Assessment	Francois P Coetzee on behalf of EnviroSaint
Study 4: Avifauna Impact Assessment	Cossypha Ecological: Robyn Phillips
Study 5: BESS Risk Assessment	iSHEcon: Debbie Mitchell
Study 6: Ecological Impact Assessment (Fauna & Flora)	Flori Scientific Services: Johannes Maree on behalf of EnviroSaint
Study 7: Geotechnical Assessment	Bare Rock Consulting: Carel De Beer
Study 8: Geohydrological Impact Assessment	Marius van Biljon on behalf of EnviroSaint (Pty) Ltd
Study 9: Socio-Economic Impact Assessment	Urban Econ
Study 10: Traffic & Transport Impact Assessment	iWink Consulting: Iris Wink
Study 11: Visual Impact Assessment (including Glint and Glare)	Environmental Planning and Design: Jon Marshall

#### **9.4.1 TERMS OF REFERENCE FOR ALL SPECIALIST STUDIES**

In April 2006, the erstwhile DEAT, now known as the DFFE issued guidelines for involving Specialists in S&EIR processes. In March and October 2020, the DFFE published GN 320 and GN 1150 respectively which prescribes the protocols in respect of specific environmental themes for the assessment of, as well as the minimum report content requirements on the environmental impacts for activities requiring an EA. When the requirements of the protocol apply, the requirements of Appendix 6 of the EIA regulations are replaced by these requirements. Each protocol applies exclusively to the environmental theme identified within its scope. Multiple themes may apply to a single application for EA and assessments for these themes must be undertaken in accordance with the relevant protocol or where no protocol has been prescribed, in accordance with the requirements of the EIA Regulations.

Specialists are expected to familiarise themselves with these guidelines and any subsequent updates, along with other relevant guidelines, codes, standards, or applicable laws related to their area of expertise. They will have to use this knowledge to accurately determine the methods and approaches for their Specialist Studies, and appropriately acknowledge compliance with these requirements. Additionally, Specialists are encouraged to consider best practices while conducting their studies.

The assessment of impacts should be broadly undertaken in accordance with the guidelines provided in the Guideline Document: EIA Regulations (DEA, 1998), NEMA principles, Section 24(4) of NEMA and the protocols for specific environmental themes.

The following General ToR apply to each of the Specialist Studies:

- Undertake site visit(s).



- Design and undertake the Specialist Study in accordance with the minimum assessment protocols for specialist themes.
- Describe the baseline conditions that exist in the study area and identify any sensitive areas that would need special consideration.
- Provide an outline of the approach used in the study.
- Outline the assumptions and limitations to the study.
- Assess all project alternatives including the no-go alternative.
- Identify, assess and evaluate the possible impacts (direct and indirect) of the Proposed Development during all development phases (planning, construction and operation).
- Identify and assess any cumulative impacts arising from the Proposed Development.
- Determine the significance of assessed impacts according to the methodology provided by the EAP and provide a revised significance rating of assessed impacts after the implementation of mitigation measures.
- Undertake field surveys, as appropriate to the requirements of the particular Specialist Study.
- Identify areas where integration of studies with other Specialists would ensure a better assessment and coordinate with other Specialists in this regard.
- Apply the precautionary principle in the assessment of impacts, in particular where there is major uncertainty, low levels of confidence in predictions and poor data or information.
- Recommend practicable mitigation measures to minimise or eliminate negative impacts and/or enhance potential project benefits.
- Recommend appropriate auditing, monitoring and review measures.
- Compile all information into a stand-alone report according to the format provided by Praxos.
- Take cognisance of and comply with the relevant guideline documents applicable to that particular Specialist Study.
- The Specialist report must comply with Appendix 6 of GNR 982 of the NEMA or as set out in the protocol defined for that specific environmental theme as per GN 320 and/ or GN 1150.

## 9.5 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

The contents of the EIR (as per Appendix 3 of GNR 982 as amended) will include the following information:

- Details and expertise of the EAP to undertake a S&EIR process.
- Detailed description of the Proposed Development.
- Detailed description of the property on which the activity is to be undertaken and the location of the activity on the property.
- A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the Proposed Development.
- Details of the PPP conducted during the detailed assessment phase of the S&EIR process.
- A description of the need and desirability of the Proposed Development.
- A description of identified potential alternatives to the Proposed Development, including advantages and disadvantages that the Proposed Development or alternatives may have on the environment and the community that may be affected by the activity.
- An indication of the methodology used in determining the significance of potential environmental impacts.
- A description and comparative assessment of all alternatives identified during the environmental impact reporting phase.
- A summary of the findings and recommendations of any Specialist report or report on specialised process.

- A description of all environmental issues that were identified during the environmental impact reporting phase, an assessment of the significance of each issue and an indication of the extent to which the issues could be addressed by the adoption of mitigation measures.
- An assessment of each identified potentially significant impact in terms of cumulative impacts, the nature of the impact, the extent and duration of the impact, the probability of the impact occurring, the degree to which the impact can be reversed, the degree to which the impact may cause irreplaceable loss of resources and the degree to which the impact can be mitigated.
- A description of any assumptions, uncertainties and gaps in knowledge.
- A reasoned opinion as to whether the 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.
- 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 Development and identified alternatives.
- A draft EMPr.
- Copies of any Specialist reports and reports on specialised processes.
- Any specific information that may be required by the CA and any other matters required in terms of sections 24(4) (a) and (b) of NEMA.

## 9.6 DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

During the compilation of the EIR, a Draft EMPr will be compiled in accordance with the EIA Regulations. The Draft EMPr will provide the actions for the management of identified environmental impacts emanating from the Proposed Development and a detailed outline of the implementation programme to minimise and/ or eliminate the anticipated negative environmental impacts. The Draft EMPr will provide strategies to be used to address the roles and responsibilities of environmental management personnel on site, and a framework for environmental compliance and monitoring. **The Draft EMPr will be included as part of the Draft EIR.**

The EMPr will include the following:

- Details and expertise of the person who prepared the EMPr.
- Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that are identified in the EIR phase, including environmental impacts or objectives in respect of planning and design, pre-construction and construction activities, operation or undertaking of the activity, rehabilitation of the environment and closure where relevant.
- A detailed description of the aspects of the activity that are covered by the draft EMPr.
- An identification of the persons who will be responsible for the implementation of the mitigation measures.
- Timeframes for the implementation of the mitigation measures.
- Environmental design criteria.
- Site establishment.
- Construction camps, offices and associated activities.
- Construction and lay down areas.
- Civil works.
- Sourcing and management of construction materials.
- Concrete batching areas.
- Disruption of existing infrastructure and services.
- Proposed mechanisms for monitoring compliance with the EMPr and reporting thereon.
- Record of the Method Statements, Environmental Incident Log and Complaints Record Sheet.
- Proposed mechanisms for monitoring compliance with the EMPr and reporting thereof.

- As far as reasonably practicable, 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 which conforms to the generally accepted principle of sustainable development, including, where appropriate, concurrent or progressive rehabilitation measures.

## 9.7 PUBLIC REVIEW OF THE EIR AND EMPr

The primary aims of the PPP includes the following:

- To disclose activities planned by the project proponent and the EIA team.
- Identify and respond to concerns, grievances and enquiries made by the I&APs.
- Harness local expertise, needs and knowledge from the I&APs.
- Identify additional or new stakeholders and people affected by, or interested in, the Proposed Development.
- Ensure that all issues and enquiries raised by I&APs have been adequately assessed and addressed.
- Share the findings of the EIA and Specialists' Studies, such as significant impacts, mitigation measures, management actions, and monitoring programmes.
- Address and include any new concerns or comments that arise.

The PPP commenced during the Scoping phase and will continue during the EIR phase, during which I&APs are afforded further opportunities to raise their issues, concerns and comments regarding the Proposed Development. It is possible that some of the project details may change in response to the preliminary findings presented in the FSR, and as a result of design changes made by the project proponent. I&APs and key stakeholders are given the opportunity to review the Draft EIR before it is submitted to the authorities for consideration. Comments on the Draft EIR received from I&APs will be included and addressed in the Final EIR.

### 9.7.1 PUBLIC REVIEW OF THE DRAFT ENVIRONMENTAL IMPACT REPORT (DEIR)

All I&APs on the Register of I&APs will be notified in writing of the availability of the DEIR for public review. The notification letter will provide details of the 30-day public comment period, the venues and websites where the report can be viewed, the contact details of the PPP consultant and how written comments on the DEIR should be submitted.

### 9.7.2 NOTIFICATION OF ENVIRONMENTAL AUTHORISATION (EA)

On receipt of the decision (*positive or negative*) from the CA, notifications via email announcing the decision will be sent to all registered I&APs. The notifications will also inform I&APs of where the decision can be accessed. Registered I&APs will be given 20 days upon receipt of the notification to lodge an appeal with the Minister, MEC, or delegated organ of state.

## 9.8 CONSULTATION WITH THE COMPETENT AUTHORITY

It is envisaged that consultation with the CA (DFFE) will coincide with the compilation and submission of the following key documents:

- DSR, FSR and PoS for EIR.
- Draft EIR and EMPr.
- Final EIR and EMPr.

## 9.9 PROPOSED DEVELOPMENT PROGRAMME FOR THE EIR PHASE

The proposed programme for the EIR process indicates the following timeframes with respect to the most important activities to be undertaken:

- Submission of the Draft EIR for public comment – **Date to be confirmed.**
- Submission of the Final EIR to the DFFE for consideration and decision-making – **Date to be confirmed.**

## 10. CONCLUSION

ABO Ndau Solar Energy Facility 1 (Pty) Ltd proposes the development of Ndau 1, a PV solar energy generation facility, of 120 MW in capacity, and associated infrastructure with a total footprint of 136 ha, located on Portion 19 of the Farm Rietvley No. 13, and the Remaining Extent of the Farm Rietvley No. 13 (access road only), 27 km south-west of Polokwane within the Limpopo Province, South Africa.

The Project Area falls within the jurisdiction of the PLM, within the CDM. The Proposed Development is located within the International Strategic Transmission Corridor, as stipulated in Government Notice No. 113 of Government Gazette No. 41445 published on 16 February 2018 however is not located within a Renewable Energy Development Zone (REDZ) and is not classified as Electricity Grid Infrastructure (EGI).

A development area has been identified for the Proposed Development. Within this identified development area, a development maximum footprint has been defined in a manner which has considered the environmental sensitivities present on the affected property and which intentionally remains beyond highly sensitive areas. The affected property has been considered in this S&EIR process (which includes the independent Specialist Studies undertaken) and assessed in terms of its suitability from an environmental and social perspective.

The Proposed Development is located outside an urban area and industrial complex with a current zoning that is agricultural in nature. A change in zoning will be required from agricultural to special use.

The Proposed ABO Ndau Solar Energy Facility 1 would comprise the following (to be located within a proposed maximum development footprint):

- Solar Field/Solar Arrays (Note that the foundations, mounting structures and module types will be confirmed during detail design, however, would remain within the proposed development footprint and be approximately 3.5m in height);
- Internal service roads (noting that existing farm roads will be used as far as possible, and that the maximum road width will be 8m);
- An access road (noting that existing farm roads/jeep tracks will be used as far as possible, and the maximum road width will be 10m);
- An on-site substation hub and associated infrastructure (such as substation, transformation infrastructure, collector infrastructure, step-up infrastructure, battery energy storage system etc.) including auxiliary buildings (such as operation & maintenance buildings, admin buildings, workshops, gatehouse, security building, offices, visitor centre, warehouses, etc.) contained within a 5-ha footprint; and
- A communications tower as part of the 5 ha on-site substation hub footprint with a maximum height of 32m.

Associated infrastructure would include the following (to be located within the proposed maximum development footprint):

- Internal electrical reticulation (i.e., low- and medium voltage cables) to be placed underground where feasible; and
- Perimeter fencing.

A temporary laydown area would be established during the construction period but would be within the maximum development footprint which has been assessed i.e., within the fenced area allocated for development and beyond any identified no-go areas. The laydown area would move as required while construction is underway.

The proposed facility will be accessed from the north via an existing unnamed road and/or from the east also via an existing farm road. The detailed design of the proposed access and road upgrade requirements will be as per the recommendations of the Transport Impact Assessment which is being undertaken as part of the S&EIR process.

The operations of the Proposed Development would require some servicing, noting that the operational electrical requirements would be nominal and would be supplied by the facility.

Water would be required for sanitation by operational staff, for washing of solar panels and for dust control on internal roads (where necessary). Water would preferably be sourced from the local municipality in terms of a Service Level Agreement established between the Municipality and the facility. A non-binding confirmation of capacity from the LM will be requested by the applicant in June 2023, with the view to have the confirmation in hand at draft EIR stage. If this is not possible, then other options for water supply will be investigated such as sourcing water commercially. Where required, a storage tank (i.e., Jo-Jo tank) of up to approximately 10,000L may be used on site for temporary water storage.

Sanitation requirements would be minimal, given that there would only be a small staff complement during the operations of the Proposed Development. Sanitation for auxiliary buildings would be connected to the existing municipal sewage system. If the Municipality does not approve, or have capacity for such a connection, sewage would be stored in a conservancy tank and collected either by a honey-sucker truck or by a service provider for treatment at a licensed disposal site. Alternatively, a standalone system would be used (i.e., porta-loos) which would be regularly serviced by an independent contractor. Note that it is not intended to make use of soakaways or on-site treatment solutions.

No bulk service infrastructure is proposed and any required pipelines to connect to the municipal network will be located within roadway.

Refuse/solid waste (i.e., non-hazardous) produced on site would also be minimal (approximately two wheelie bins per week are anticipated) and would ideally be removed by the Municipality, however, if this is not possible, the Proposed Development would employ private contractors to remove the refuse and dispose of it appropriately.

There are no specific stormwater and/or landscaping initiatives proposed as part of the Proposed Development at this stage, but any interventions prescribed by the relevant specialist/s through the environmental impact assessment process would be implemented.

Water and sanitation requirements during the construction phase will be the primary responsibility of the appointed Contractor. It would be preferable for water to be sourced from the local Municipality, if available, with alternative arrangements to be made where required (for example transporting water to site with trucks). Solid waste produced during construction would be managed in accordance with the specifications of the site-specific EMPr.

#### Alternatives:

The proposed development as described above has been assessed with the following alternatives:

1. Layout: A second access route of 1.3 km will be assessed as an alternative or potential second access route during the EIA phase. This is an existing farm access route running through the same property as the Proposed Development. Consultation will first need to be undertaken between the Applicant and the landowner to determine if they would be given permission to use this route.

2. Technology: With regard to the proposed Battery Energy Storage System (BESS), the technology thereof is dynamic and so the specific type/technology to be developed would be selected based on market demands and technology availability at the time of construction. Therefore, both Lithium-ion and redox-flow are to be assessed as technology alternatives, with Lithium-ion being the current preferred technology. The Lithium-Ion BESS will arrive to site pre-assembled.

The no-go alternative will also be assessed.

Application for grid connection will be made through a separate EIA process and assessed accordingly. An on-site grid connection to integrate into the national network via a 132 kV or 275 kV line is under consideration.

Several aspects associated with the establishment of the Proposed Development requires further investigation:

- Visual intrusion on the landscape.
- Ecological sensitivity (flora and fauna).
- Avifaunal sensitivity.
- Agricultural soil potential.
- Aquatic sensitivity.
- Heritage sites and resources.
- Increase in traffic.
- Socio-economic impacts and benefits.

These key sensitivities are to be comprehensively addressed and assessed according to the ToR developed for each Specialist during the EIR phase.

## 10.1 CONCLUDING STATEMENT & WAY FORWARD

It is the opinion of the EAP that, at this stage, no fatal flaws have been identified and there is no reason why the Proposed Development should not proceed to the EIR phase for further assessment.

In terms of the location alternatives, the chosen location for the Proposed Development is considered to be the most suitable based on the outcomes of several factors explained in **Section 3**, therefore no alternatives will be further investigated.

The Proposed Development will be for the construction of a solar PV facility for the generation of electricity. It is the type of activity chosen by the Applicant due to several factors including location, climate, economic viability, and the need and desirability. Therefore, no alternatives for land use will be investigated further during the EIR phase in respect to activity alternatives.

Presently, there are no layout alternatives that are being considered as, based on the information available at present, it is believed that the current layout represents low-impact development which purposefully avoids highly sensitive areas. Two alternative access routes will however be investigated.

Since BESS technology is dynamic, the Applicant will determine the specific technology to be developed based on market demands and technology availability at the time of construction. Accordingly, both lithium-ion and redox-flow batteries will be assessed as technology alternatives during the EIR phase, **with lithium-ion currently being the preferred technology**.



There are no operational alternatives considered for the Proposed Development given the nature of the development which only allows for electricity generation during operations.

It is however noted that PPP must still be undertaken which may bring novel issues to light. All comments received on the DSR will be captured, responded to, and addressed in the FSR prior to submission to the DFFE for decision-making.

The commencement of the EIR phase is dependent on the acceptance of the FSR and PoS for the EIR by the CA. Once the acceptance is received, the EAP will be instructed to proceed with the activities outlined in the PoS for the EIR phase of the EA application process. The PoS for EIR is aimed at meeting the requirements of the EIA Regulations as a minimum.

The methodologies proposed for obtaining the information required to effectively identify and assess the potential environmental impacts of the project are considered to be comprehensive and sufficient to allow for the compilation of an EIR which addresses I&AP concerns, and which will provide the CA with the appropriate information necessary to allow for informed decision-making on the application for authorisation.


Praxos as the EAP and the project team commits to do the following:

- Facilitate a fair and transparent process going forward.
- Capture and consider all comments received from stakeholders and I&APs.
- Remain independent of the Applicant.
- Present the CA with the necessary information to reach a decision.
- Fulfil any and all other obligations placed on the EAP in terms of the NEMA.

## 11. EAP DECLARATION

The EAP herewith declares:

Detail	Confirmation
11(a) The correctness of the information provided in the reports.	<input checked="" type="checkbox"/>
11(b) The inclusion of comments and inputs from stakeholders and I&APs.	<input checked="" type="checkbox"/>
11(c) Any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by I&APs.	<input checked="" type="checkbox"/>
11(d) The level of agreement between the EAP and I&APs on the PoS for undertaking the EIA.	<input checked="" type="checkbox"/>

<b>Signature of the EAP:</b>	
<b>Name of company:</b>	Praxos 373 (Pty) Ltd
<b>Date:</b>	08 September 2023



## Appendix A: CV's of the Project Team & EAP Declarations Under Oath



## Appendix B: Authority Consultation



## Appendix B1: Pre-Application Meeting Request Form



## Appendix B2: Minutes of Pre-Application Meeting with DFFE and Attendance Register



## Appendix B3: Application for Environmental Authorisation





## Appendix C: Public Participation Process



## Appendix C1: List of I&APs



## Appendix C2: Newspaper Advertisements and Proof



## **Appendix C3: Notification Letter of Invitation to Comment on the DSR and Registration as an I&AP**



## Appendix C4: Site Notice and Proof



## Appendix D: Site Photograph Plate



## Appendix E: DFFE Screening Tool Report



## Appendix F: Specialist Studies





## Appendix F1: Agricultural Potential SSV Report



## Appendix F2: Aquatic SSV Report



## Appendix F3: Avifaunal SSV Report



## Appendix F4: Cultural Heritage Desktop Report



## Appendix F5: Geohydrological Desktop Report



## Appendix F6: Landscape and Visual Baseline Report



## Appendix F7: Socio-Economic Preliminary Assessment Report



## Appendix F8: Terrestrial Ecological SSV Report





## Appendix F9: EAP SSV Report



## Appendix G: Maps