



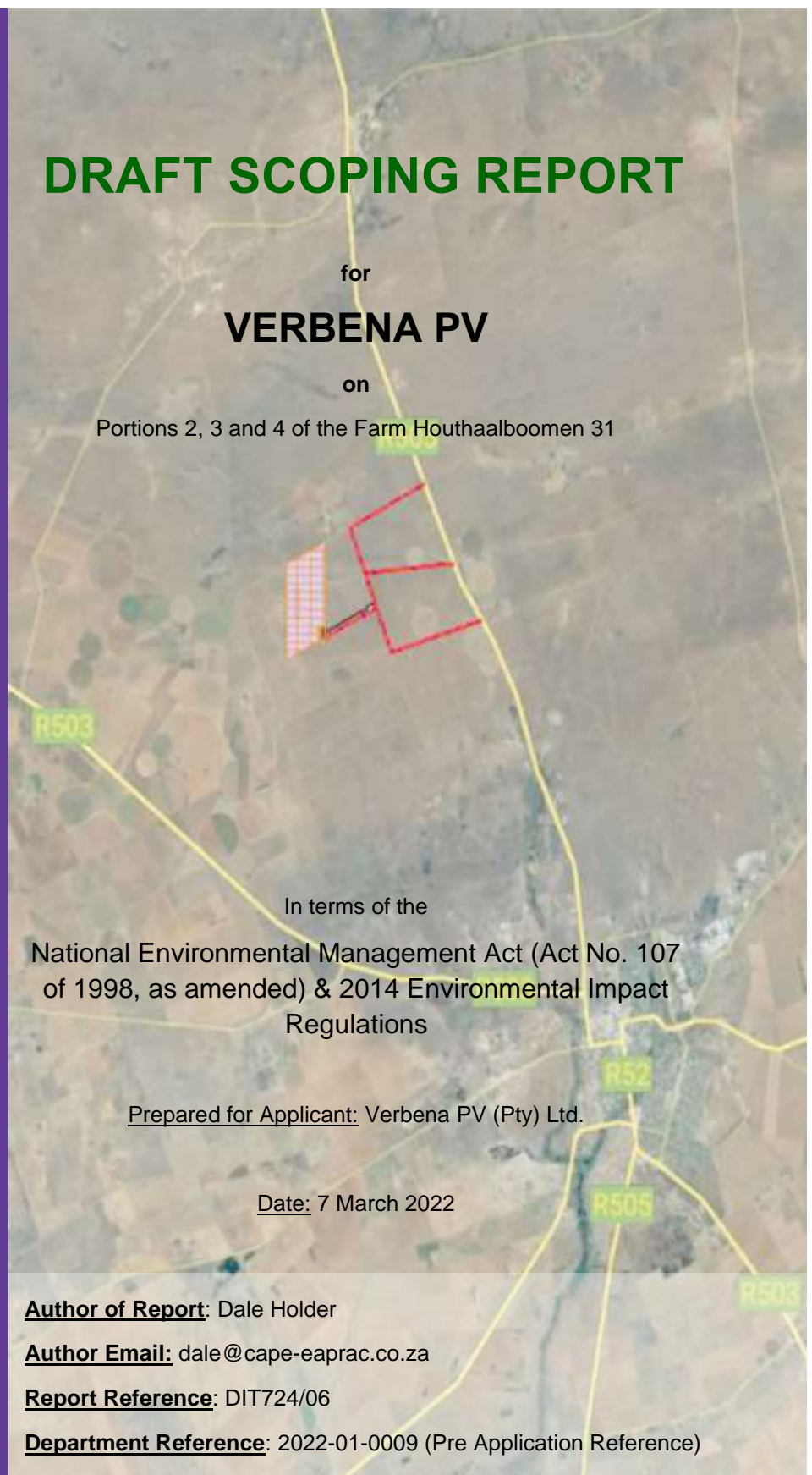
# DRAFT SCOPING REPORT

for

## VERBENA PV

on

Portions 2, 3 and 4 of the Farm Houthaalboomen 31



In terms of the  
National Environmental Management Act (Act No. 107  
of 1998, as amended) & 2014 Environmental Impact  
Regulations

Prepared for Applicant: Verbena PV (Pty) Ltd.

Date: 7 March 2022

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Report Reference: DIT724/06

Department Reference: 2022-01-0009 (Pre Application Reference)

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# DOCUMENT TRACKING

## DOCUMENT HISTORY

REVISION	DATE	AUTHOR
Draft Scoping Report	07 March 2022	Dale Holder
Final Scoping Report	Pending	Dale Holder

## APPROVAL FOR RELEASE

NAME	TITLE	SIGNATURE
Dale Holder	Senior Environmental Practitioner	

## DISTRIBUTION

DISTRIBUTION LIST
Registered and Potential Registered and Affected Parties
Department of Forestry, Fisheries and the Environment
Verbena PV (Pty) Ltd

## SUBMISSION AND CORRESPONDENCE

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Application form Submitted	07 March 2022
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**Registrations:** IAIAAsa. EAPASA (pending)

**PURPOSE OF THIS REPORT:**

Stakeholder Review and Comment

**APPLICANT:**

Verbena PV (Pty) Ltd.

**CAPE EAPRAC REFERENCE NO:**

DIT724/06

**DEPARTMENT REFERENCE:**

2022-01-0009 (Pre Application Reference)

**SUBMISSION DATE:**

07 March 2022

# DRAFT SCOPING REPORT

in terms of the

National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended & Environmental Impact Regulations 2014

## Verbena PV

### Portions 2, 3 and 4 of the Farm Houthaalboomen 31

Submitted for:

#### Stakeholder Review & Comment

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## REPORT DETAILS

<b>Title:</b>	Draft Scoping Report for Verbena PV
<b>Purpose of this report:</b>	<p>This Draft Scoping report is available to all registered and potential Interested and Affected Parties (I&amp;AP's).</p> <p>This Draft Scoping Report forms part of a series of reports and information sources that are being provided during the Environmental Impact Assessment (EIA) for the proposed Verbena PV Renewable Energy Facility in the North West Province. This is the first report in the series that that forms part of the environmental process. Registered I&amp;APs will be given an opportunity to comment on the following reports as part of this environmental process:</p> <ul style="list-style-type: none"> <li>- Draft Scoping Report,</li> <li>- Draft Environmental Impact Assessment Report, and</li> <li>- Draft Environmental Management Programme</li> </ul> <p>In accordance with the regulations, the objectives of a scoping process is to, through a consultative process:</p> <ol style="list-style-type: none"> <li>(a) identify the relevant policies and legislation relevant to the activity;</li> <li>(b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;</li> <li>(c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;</li> <li>(d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;</li> <li>(e) identify the key issues to be addressed in the assessment phase;</li> <li>(f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and</li> <li>(g) identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.</li> </ol> <p>The Draft Scoping Report is available to all stakeholders for a 30 day review &amp; comment period, 08 March 2022 – 08 April 2022.</p> <p>An application has been submitted to the Department of Forestry, Fisheries and the Environment for the proposed Verbena PV.</p>
<b>Prepared for:</b>	Verbena PV (Pty) Ltd
<b>Published by:</b>	Cape Environmental Assessment Practitioners (Pty) Ltd. (Cape EAPrac)
<b>Authors:</b>	Mr Dale Holder
<b>Cape EAPrac Ref:</b>	DIT724/06
<b>DFFE Case officer &amp; Ref. No:</b>	Ms Azrah Essop 2022-01-0009 (pre-application reference)
<b>Date:</b>	07 March 2022
<b>To be cited as:</b>	<i>Cape EAPrac</i> , 2022. Draft Scoping Report for the proposed Verbena PV. Report Reference: DIT724/06. George.

# TECHNICAL CHECKLIST

The following technical checklist is included as a quick reference roadmap to the proposed project.

Administration			
<b>Applicant Details</b>	Applicant Name:	Verbena PV (Pty) Ltd Verbena PV (Pty) Ltd is a Special Purpose Vehicle (SPV) incorporated for the sole purpose of developing, constructing, and operating a proposed 100 MW solar PV facility located on portion 2, 3 and 4 of the farm Houthaalboomen 31.	
	Company Registration Number:	2022/232212/07	
	BBBEE Status:	n/a	n/a
	Project Name:	Verbena PV	
Site Details			
<b>Size of the property</b>	Description and Size in hectares of the affected property.	<p><b>PV Site:</b></p> <ul style="list-style-type: none"> <li>- HOUTHAALBOOMEN, being the remaining extent of Portion 2 of Farm No 31, Title Deed number T70650/2013 situated in the Ditsobotla Municipality, North West Province, in extent 2064689.14; TOIP0000000003100002</li> <li>- HOUTHAALBOOMEN, being Portion 3 of Farm No 31, Title Deed number T70650/2013 situated in the Ditsobotla Municipality, North West Province, in extent 2008904.62; TOIP0000000003100003</li> <li>- HOUTHAALBOOMEN, being Portion 4 of Farm No 31, Title Deed number T70650/2013 situated in the Ditsobotla Municipality, North West Province, in extent 1951349.55; TOIP0000000003100004</li> </ul> <p><b>Access Road<sup>1</sup></b></p> <p><b>Alternative 1 (preferred):</b></p> <ul style="list-style-type: none"> <li>- HOUTHAALBOOMEN, being Portion 23 of Farm No 31; TOIP0000000003100025; 10248821.06</li> </ul> <p><b>Alternative 2:</b></p> <ul style="list-style-type: none"> <li>- HOUTHAALBOOMEN, being Portion 23 of Farm No 31; TOIP0000000003100025; 10248821.06</li> <li>- HOUTHAALBOOMEN, being Portion 6 of Farm No 31; TOIP0000000003100006; 1956855.91</li> <li>- HOUTHAALBOOMEN, being Portion 5 of Farm No 31; TOIP0000000003100005; 1961680.44</li> </ul> <p><b>Alternative 3:</b></p> <ul style="list-style-type: none"> <li>- HOUTHAALDOORNS, being Portion 3 of Farm No 2; TOIP000000000200003; 6006132.76</li> <li>- HOUTHAALDOORNS, being the remaining extent of Farm No 2R; TOIP000000000200000; 11162649.62</li> </ul>	
<b>Size of the study area</b>	Size in ha of initial study area.	220 ha	
<b>Development Footprint</b>	This includes the total footprint of PV panels, auxiliary buildings, onsite substation, BESS, inverter stations and internal roads.	The final development footprint will be determined at a later stage once all sensitive areas identified by the participating specialists have been incorporated into the design of the facility.	
Technology Details			

<sup>1</sup> The property details reflected below, are for all of the alternatives under investigation. On completion of the scoping phase certain of these alternatives (along with the affected property portions) will be eliminated from this environmental process.

Capacity of the facility	Capacity of facility (in MW)	Net generation (contracted) capacity of up to 100 MWac
<b>Solar Technology selection</b>	Type of technology	<ul style="list-style-type: none"> <li>- PV modules and mounting structures (monofacial or bifacial) with fixed, single or double axis tracking mounting structures;</li> <li>- Inverter-station, transformers and internal electrical reticulation (underground cabling where practical);</li> <li>- Battery Energy Storage System (BESS);</li> <li>- Site and internal access roads (up to 8 m wide);</li> <li>- Auxiliary buildings (MV switch room, gate-house and security, control centre, office, warehouse, canteen &amp; visitors centre, staff lockers etc.);</li> <li>- Temporary and permanent laydown area;</li> <li>- Perimeter fencing and security infrastructure;</li> <li>- Rainwater Tanks; and</li> <li>- Grid connection solution, including:               <ol style="list-style-type: none"> <li>1. Medium-voltage cabling between the project components and the facility substation; and</li> <li>2. Up to 132 kV facility substation;</li> <li>3. The facility substation position is located adjacent to the proposed Houthaalboomen North Collector Switching Station, and not adjacent to the PV arrays (please note: Houthaalboomen North Collector Switching Station and the (up to) 132kV overhead line to the Watershed MTS is being assessed in a separate BA).</li> <li>4. Additional MV cabling from an on-site MV switch room to the facility substation. A 100 m wide corridor of approximately 1.5 km long has been assessed to allow for micro-siting.</li> </ol> </li> </ul>
	Structure height	Solar panels with a maximum height of $\pm 5.5$ m above the ground
	Structure orientation	Fixed-tilt: north-facing at a defined angle of tilt, or Single or double axis tracking: mounted in a north-south orientation, tracking from east to west.
	Laydown area dimensions	Temporary Laydown Area: $\pm 5$ ha Permanent Laydown Area: Less than $\pm 1$ ha will remain in place for operations
<b>Storage Technology</b>	BESS	<p>A Battery Energy Storage System (BESS).technical report is appended to this Draft Scoping Report in Appendix E8.</p> <p>Area: up to <math>\pm 4</math> ha Technology: Solid State Battery Technologies</p>
<b>Own-Build Grid Connection</b>		
<p>It is estimated that the maximum size of the facility substation will not exceed 1 ha. The substation will have switchgear portals up to 15 m in height and possible lightning masts up to 25 m in height.</p> <p>The facility substation will collect the power from the facility and transform it from medium voltage (up to 33 kV) to high voltage (up to 132 kV).</p> <p>The facility will include inverter-stations, transformers, switchgear and internal electrical reticulation (underground cabling).</p> <p>The facility substation position is located adjacent to the proposed Houthaalboomen North Collector Switching Station, and not adjacent to the PV arrays (please note: Houthaalboomen North Collector Switching Station and the (up to) 132 kV overhead line to the Watershed MTS is being assessed in a separate BA).</p> <p>Therefore, the PV facility will require additional MV cabling from an on-site MV switch room to the facility substation. A 100 m wide corridor of approximately 1.5 km long has been assessed to allow for micro-siting.</p>		
<b>Auxiliary Infrastructure</b>		
<b>Other infrastructure</b>	Additional Infrastructure	<p>Auxiliary buildings of approximately 1 ha, including (but not limited to):</p> <ul style="list-style-type: none"> <li>• 33 kV switch room, a gate house, ablutions, workshops, storage and warehousing areas, site offices and a control centre;</li> <li>• Rain water tanks; and</li> </ul>

		<ul style="list-style-type: none"> <li>• Electrified perimeter fencing not exceeding 5 m in height.</li> </ul>
	Details of access roads	The access roads will not exceed 8 m in width for the wearing course. The total width including all stormwater management structures will not exceed 10 m wide. The majority of the access road will comprise expansion of sections of existing farm roads, while a small section will comprise sections of a new road.
	Details of internal roads	A network of gravel internal access roads and perimeter roads with a width of up to $\pm 5$ m, will be constructed to provide access to the various components of each facility.
	Extent of areas required for laydown of materials and equipment	Approximately 2-5 ha of laydown areas will be required during construction (laydown areas will not exceed 5 ha). A permanent laydown area of a maximum of a 1 ha will remain.

## LOCATION OF ACTIVITY

The following description provides the summary of the currently proposed development footprint that forms part of this scoping process. Please note that the preferred footprint (i.e. the preferred mitigated alternative) will be developed, based on the constraints and sensitivities identified during this scoping process. This preferred mitigated alternative will form part of the environmental impact assessment phase of the environmental process.

Location	Latitude	Longitude
PV Facility - North-West Corner	26° 03' 39.91"S	26° 04' 31.63"E
PV Facility - North-East Corner	26° 03' 24.33"S	26° 05' 06.28"E
PV Facility - South-West Corner	26° 04' 46.10"S	26° 04' 31.06"E
PV Facility - South-East Corner	26° 04' 30.91"S	26° 05' 05.75"E
Facility Substation (Centrepoint)	26° 04' 10.23"S	26° 05' 48.00 "E
Main Access Road <sup>2</sup>		

- for the proposed 100 MW **Verbena PV** energy facility and associated infrastructure located on portions 2, 3 and 4 of the farm Houthaalboomen 31, hereafter referred to as "the property".

The **Verbena PV** Energy Facility is to consist of solar photovoltaic (PV) technology with fixed, single or double axis tracking mounting structures, with a net generation (contracted) capacity of 100 MWAC (MegaWatts - Alternating Current) which will include:

- PV modules and mounting structures;
- Inverters and transformers;
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 8m wide);
- Auxiliary buildings (22kV or 33kV switch room, gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Temporary and permanent laydown area;
- Cabling between the panels; and

<sup>2</sup> The co-ordinates of the access road will be provided once the preferred access alternative is determined after the scoping phase of the environmental process.



- Grid connection infrastructure, including<sup>3</sup>:
  - Underground medium-voltage cabling between the project components and the facility substation (within a 100 m wide and ±1.5 km in length corridor); and
  - Up to 132kV facility substation

## CONTENTS OF A SCOPING REPORT

Section 2 in Appendix 2 of regulation 982 details the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process. The table below lists the minimal contents of a scoping report in terms of these regulations;

Requirement	Details
(a) details of - (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	This was compiled by Dale Holder of Cape Environmental Assessment Practitioners (Pty) Ltd (Cape EAPrac). Details of the EAP are included at the beginning of this report. A CV of the author as well as a company profile of Cape EAPrac is attached in Appendix G3.
(b) the location of the activity, including - (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	The proposed facility is to be situated Northwest of Lichtenburg on Portions 2, 3 and 4 of the Farm Houthaalboomen 31, in the Ditsobotla Local Municipality within the Ngaka Modiri Molema District Municipality in the Northwest Province  21 digit Surveyor General codes: - C0410000000000310002 - C0410000000000310003 - C0410000000000310004
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	A location plan including co-ordinates of the proposed activity is attached in Appendix A.  <u>North-West Corner</u> 26° 03' 39.91"S    26° 04' 31.63"E <u>North-East Corner</u> 26° 03' 24.33"S    26° 05' 06.28"E <u>South-West Corner</u> 26° 04' 46.10"S    26° 04' 31.06"E <u>South-East Corner</u> 26° 04' 30.91"S    26° 05' 05.75"E  <u>Facility Substation</u> 26° 04' 10.23"S    26° 05' 48.00 "E
(d) a description of the scope of the proposed activity, including - (i) all listed and specified activities triggered; (ii) a description of the activities to be undertaken, including associated structures and infrastructure;	The description of the proposed activity is detailed in section 2 of this report.  Listed and specified activities triggered are detailed in section 3.7.2 of this report.
(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	The legislative and policy context is included in section 3 of this report.
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	The need and desirability of the project is included in section 2.3 of this report.

<sup>3</sup> The Grid connection infrastructure from the Houthaalboomen North Collector Switching station to the Watershed MTS will be assessed as part of a separate environmental process.

Requirement	Details
<p>(h) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including -</p> <ul style="list-style-type: none"> <li>(i) details of all the alternatives considered;</li> <li>(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;</li> <li>(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;</li> <li>(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</li> <li>(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts - <ul style="list-style-type: none"> <li>(aa) can be reversed;</li> <li>(bb) may cause irreplaceable loss of resources; and</li> <li>(cc) can be avoided, managed or mitigated;</li> </ul> </li> <li>(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;</li> <li>(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;</li> <li>(viii) the possible mitigation measures that could be applied and level of residual risk;</li> <li>(ix) the outcome of the site selection matrix;</li> <li>(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and</li> <li>(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;</li> </ul>	<p>The details of all alternatives considered is included in section 2.5.</p> <p>The details of the public participation already undertaken as well as the details of the public participation for the remainder of the environmental process is detailed in section 7 of this report.</p> <p>An issues and responses will be included in Annexure F2 on completion of the initial Public Participation Process.</p> <p>Detailed site description and attributes is included in section 4 of this report.</p> <p>A description of potential impacts identified by the EAP as well as participating specialists is included in section 8.2 of this report.</p> <p>The methodology used for the determination and ranking of significance is included in section 8.3 of this report. Please also refer to the specific methodologies in the specialist reports attached in Annexures E1 – E9.</p> <p>This scoping report identifies the potential positive and negative impacts associated with the proposed project. These are included in section 8.3 of this report. An assessment of the significance of these identified impacts will take place in the impact assessment phase of this environmental process.</p> <p>The potential mitigation measures will only be identified once the detailed impact assessment has been completed.</p> <p>Details regarding the criteria for the selection of the preferred site selection is included in section 2.4 of this report.</p> <p>Alternatives, have been discussed in section 2.5 of this report.</p> <p>The preferred alternative will only be determined in the impact assessment phase of the environmental process once all the specialists have identified the no-go areas in respect of the proposed development.</p>
<p>(i) a plan of study for undertaking the environmental impact assessment process to be undertaken, including -</p> <ul style="list-style-type: none"> <li>(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;</li> <li>(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;</li> <li>(iii) aspects to be assessed by specialists;</li> <li>(iv) a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;</li> <li>(v) a description of the proposed method of assessing duration and significance;</li> <li>(vi) an indication of the stages at which the competent authority will be consulted;</li> <li>(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and</li> <li>(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;</li> </ul>	<p>The plan of study for Environmental Impact Assessment phase of the environmental process is included in section 8 of this report.</p>

Requirement	Details
(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	
(j) an undertaking under oath or affirmation by the EAP in relation to - (i) the correctness of the information provided in the report; (ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	The signed EAP declaration is included in the application form submitted simultaneously with this Draft Scoping Report.
(k) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	Please refer to the plan of Study for EIA included in section 8 of this report.
(l) where applicable, any specific information required by the competent authority;	The submission of this draft scoping report to the competent authority, allows the competent authority to advise the EAP on any specific additional requirements.
(m) any other matter required in terms of section 24(4)(a) and (b) of the Act.	Compliance with this section will be required at a later stage, once the competent authority has considered the contents of this Draft Scoping Report.

# ORDER OF REPORT

Report Summary

**Draft Scoping Report – Main Report**

<b>Appendix A</b>	:	Location, Topographical Plans (Cape EAPrac, 2022)
<b>Appendix B</b>	:	Biodiversity Overlays (Cape EAPrac, 2022)
<b>Appendix C</b>	:	Site Photographs (Cape EAPrac, 2022)
<b>Appendix D</b>	:	Solar Facility Layout Plans (Verbena PV (Pty) Ltd, 2022 <sup>4</sup> )
<b>Appendix E</b>	:	Supplementary Reports (Specialist Reports and Technical Reports)
<b>Annexure E1</b>	:	Terrestrial and Aquatic Ecological Scoping Report (The Biodiversity Company, 2022)
<b>Annexure E2</b>	:	Avifaunal Scoping Report (Pachnoda Consulting, 2022)
<b>Annexure E3</b>	:	Agricultural Scoping Report (TerraAfrica, 2022)
<b>Annexure E4</b>	:	Heritage Scoping Assessment (Van der Walt, 2022)
<b>Annexure E5</b>	:	Visual Scoping Assessment (Stead, 2022)
<b>Annexure E6</b>	:	Social Scoping Assessment (Barbour, 2022)
<b>Annexure E7</b>	:	Technical Layout Development Report (Verbena PV (Pty) Ltd, 2022)
<b>Annexure E8</b>	:	Battery Energy Storage Technical Report (Verbena PV (Pty) Ltd, 2022)
<b>Annexure E9</b>	:	Site Selection Matrix (Verbena PV (Pty) Ltd, 2022)
<b>Appendix F</b>	:	Public Participation Process
<b>Annexure F1</b>	:	I&AP Register
<b>Annexure F2</b>	:	Comments and Response Report (to be included in final scoping report)
<b>Annexure F3</b>	:	Adverts & Site Notices (to be included in final scoping report)
<b>Annexure F4</b>	:	Draft Scoping Report Notifications (to be included in final scoping report)
<b>Annexure F5</b>	:	Draft Scoping Report Comments and Responses (to be included in final scoping report).
<b>Annexure F6</b>	:	Public Participation Plan
<b>Annexure F7</b>	:	Approval of Public Participation Plan
<b>Appendix G</b>	:	Other Information
<b>Annexure G1</b>	:	Correspondence with Authorities

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<sup>4</sup> Detailed layout plans will form part of the Environmental Impact Assessment Phase of the environmental process, once all sensitivities have been determined and the layout plan adapted accordingly.

- Annexure G2** : Landowner Consent
- Annexure G3** : EAP Declaration & CV
- Annexure G4** : Specialist Declarations
- Annexure G5** : Title Deed / Windeed Report
- Annexure G8** : Screening Tool Report

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# DRAFT SCOPING REPORT - OVERVIEW

## 1 PROJECT OVERVIEW

Cape EAPrac has been appointed by **Verbena PV (Pty) Ltd**, hereafter referred to as the Applicant, as the independent Environmental Assessment Practitioner (EAP), to facilitate the Scoping & Environmental Impact Reporting (S&EIR) process required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998) for the proposed development of the '**Verbena PV**' Energy Facility near Lichtenburg in the Northwest Province of South Africa.

Verbena PV (Pty) Ltd have an option to lease the project development area within Portions 2,3 and 4 of the Farm 31 Houthaalboomen from the landowner for the purposes of developing the proposed solar facility. A copy of a letter from the landowner providing consent for the continuation of the EIA is attached in Annexure G2.

The proposed access roads to the facility constitute a linear activity and as such, landowner consent is not required in terms of these regulations. These landowners have been automatically registered as an interested and affected party and will be given an opportunity to provide input into this environmental process.

The total generation capacity (contracted capacity) of the solar facility will not exceed 100MW for input into the National Eskom grid. The project will feed into the National Grid via the existing Watershed Major Transmission Substation (MTS)

This Draft Scoping Report is available for review and comment for a period of 30 Days extending from: **08 March 2022 – 08 April 2022**.

## 2 NEED AND DESIRABILITY

Need and desirability has been considered in detail in this environmental process. The overall need and desirability in terms developing renewable energy generation in South Africa and Globally is considered in section 1.2, while the project specific need and desirability is considered in section 2.3 of this report.

## 3 ENVIRONMENTAL LEGISLATIVE REQUIREMENTS

The current assessment is being undertaken in terms of the **National Environmental Management Act** (NEMA, Act 107 of 1998)<sup>5</sup>. This Act makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the competent authority (in this case, the national Department of Forestry, Fisheries and the Environment (DFFE) based on the findings of an Environmental Assessment.

The proposed development entails a number of listed activities, which require a **Scoping & Environmental Impact Reporting (S&EIR) process**, which must be conducted by an independent environmental assessment practitioner (EAP). Cape EAPrac has been appointed to undertake this process.

The listed activities associated with the proposed development, as stipulation under 2014 Regulations **983, 984 and 985** are as follows:

---

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

**Table 1:** NEMA 2014 (As amended in April 2017) listed activities applicable to Verbena PV.

Listed activity as described in GN R.983, 984 and 985	Description of project activity that triggers listed activity
<b>Regulation GN R. 983 – Basic Assessment</b>	
<b>GNR 983 Item 11:</b> The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	The proposal includes MV cabling of up to 33 Kilovolts and an on-site (facility) facility substation with a capacity of up to 132 kilovolts.
<b>GNR 983 Item 24:</b> 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;	The proposed main access road to Verbena PV will be up to 8m wide, but with the inclusion of side drains and gavel embankments, will exceed the threshold of this activity.
<b>GNR 983 Item 28:</b> 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;	The proposed Verbena PV development is considered to be commercial use and the total footprint size will exceed 1 hectare.
<b>GNR 983 Item 56:</b> 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;	The existing access road from the R505 will be lengthened by more than 1km in order to reach Verbena PV.
<b>Regulation GN R. 984 - Scoping and Environmental Impact Reporting</b>	
<b>GNR 984 Item 1:</b> .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 Verbena PV will have a generation capacity of up to 100 megawatts.
<b>GNR 984 Item 15:</b> The clearance of an area of 20 hectares or more of indigenous vegetation.	The proposed Verbena PV will require the clearance of an area in excess of 20ha and as such exceeds the threshold of this activity.
<b>Regulation GN R. 985 – Basic Assessment</b>	
<b>GNR 985 Item 4:</b> The development of a road wider than 4 metres with a reserve less than 13,5 metres. h. North West vi. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve;;	This activity may be applicable pending the confirmation of the legislative status of the Lichtenberg Game Breeding Centre which is situated approximately 3.6km to the East of the Verbena PV access road
<b>GNR 985 Item 18:</b> The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. h. North West ii. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve;	This activity may be applicable pending the confirmation of the legislative status of the Lichtenberg Game Breeding Centre which is situated approximately 3.6km to the East of the Verbena PV access road.

**NOTE:** Basic Assessment as well as Scoping and Environmental Impact Reporting Activities are being triggered by the proposed development and as such, the Environmental Process will follow a Scoping and Environmental Impact Reporting process.

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

Before any of the above mentioned listed activities can be undertaken, authorisation must be obtained from the relevant authority, in this case the National Department of Forestry, Fisheries and the Environment (DFFE). Should the Department approve the proposed activity, the Environmental Authorisation does not exclude the

need for obtaining relevant approvals from other Authorities who have a legal mandate in respect of the proposed development.

## 4 DEVELOPMENT PROPOSAL & ALTERNATIVES

The Applicant, Verbena PV (Pty) Ltd, is proposing the construction of a photovoltaic (PV) solar energy facility (known as the Verbena PV facility) located on a site approximately 10 km north west of the town of Lichtenburg in the North West Province. The solar PV facility will comprise several arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 100 MW. Please see the technical layout development report compiled by Verbena PV (Pty) Ltd attached in Annexure E7, from which the following is drawn.

The development area is situated within the Ditsobotla Local Municipality within the Ngaka Modiri Molema District Municipality and is accessible via the R505, located east of the development area.

Two additional 100 MW PV facilities (Euphorbia PV and Hillardia PV) are concurrently being considered on the project site (within Portion 2, Portion 3, and Portion 4 of the Farm Houthaalboomen 31) and are assessed through separate Environmental Impact Assessment (EIA) processes.

The development area for the PV facility and associated infrastructure will be located on the following properties:

- Portion 2 of the Farm Houthaalboomen 31
- Portion 3 of the Farm Houthaalboomen 31
- Portion 4 of the Farm Houthaalboomen 31

An assessment area of approximately 220 ha is being assessed as part of this EIA process and the infrastructure associated with the 100 MW facility includes:

- PV modules and mounting structures;
- Inverters and transformers;
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 8m wide);
- Auxiliary buildings (22kV or 33kV switch room, gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Temporary and permanent laydown area;
- Cabling between the panels, to be laid underground where practical; and
- Grid connection infrastructure, including:
  - Underground medium-voltage cabling between the project components and the facility substation (within a 100 m wide and  $\pm 1.5$  km in length corridor); and
  - Up to 132kV facility substation

## 5 PROFESSIONAL INPUT

The following professionals / specialists have provided input into this Scoping Process and will undertake further actions in the Environmental Impact Assessment Phase, as outlined in the Plan of Study for Impact Assessment in section 21 of this report.

- |                       |   |   |
|-----------------------|---|---|
| • Terrestrial Ecology | - | The Biodiversity Company (Multiple Authors) |
| • Avifaunal           | - | Pacnoda Consulting (Mr Lukas Niemand)       |
| • Heritage            | - | Beyond Heritage (Mr Jaco van der Walt)      |

- Agricultural Potential - TerraAfrica (Ms Mariné Blaauw)
- Visual - Visual Resource Management Africa (Mr Stephen Stead)
- Freshwater Ecology - The Biodiversity Company (Multiple Authors)
- Engineering Layout Design - Verbena PV (Pty) Ltd
- Social - Tony Barbour Consulting (Mr Tony Barbour)
- Stormwater - To be appointed during EIA Phase
- Traffic and Transportation - To be appointed during EIA Phase
- Planning - To be appointed during EIA Phase

Note that not all of these professionals are considered specialists as contemplated in chapter 3 of Regulation 326. Studies such as Engineering, Stormwater, Traffic, water consumption and planning constitute “technical” studies, rather than specialist studies and as such, the requirements in appendix 6 of R326 do not apply to all these professionals.

## 6 CONCLUSIONS & RECOMMENDATIONS

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

This Draft Scoping report summarises the process to date, reports on the findings of relevant baseline studies and outlines the requirements for the remainder of the environmental process.

*Cape EAPrac* is of the opinion that the information contained in this Draft Scoping Report and the documentation attached hereto is sufficient to allow the general public and key stakeholders (including the competent authority) to apply their minds to the potential negative and/or positive impacts associated with the development, in respect of the activities applied for.

The outcome of this scoping report, has not identified any fatal flaws associated with the development of the proposed Verbena PV Facility. The currently proposed footprint of the development may need to be adapted to avoid any sensitive features identified by the participating specialists during the EIA phase of the Environmental Process.

Subject to the outcome of the public participation process, it is *Cape EAPrac*'s reasoned opinion that the project should proceed to the Environmental Impact Assessment phase of the environmental process.

All stakeholders were requested to review this Scoping Report and the associated appendices, and provide comment, or raise issues of concern, directly to *Cape EAPrac* within the specified 30-day comment period.

# DRAFT SCOPING REPORT - MAIN REPORT

## 1 INTRODUCTION

Cape EAPrac has been appointed by **Verbena PV (Pty) Ltd**, hereafter referred to as the Applicant, as the independent Environmental Assessment Practitioner (EAP), to facilitate the Scoping & Environmental Impact Reporting (S&EIR) process required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998) for the proposed development of the '**Verbena PV**' Energy Facility near Lichtenburg in the Northwest Province of South Africa.

Verbena PV (Pty) Ltd have an option to lease the project development area within Portions 2,3 and 4 of the Farm 31 Houthaalboomen from the landowner, for the purposes of developing the proposed solar facility. A copy of a letter from the landowner providing consent for the continuation of the EIA is attached in Annexure G2.

The proposed access roads to the facility constitute a linear activity and as such, landowner consent is not required in terms of these regulations. These landowners have been automatically registered as an interested and affected party and will be given an opportunity to provide input into this environmental process.

The total generation capacity (contracted capacity) of the solar facility will not exceed 100MW for input into the National Eskom grid. The project will feed into the National Grid via the existing Watershed Major Transmission Substation (MTS)

The purpose of this **Draft Scoping Report** is to describe the environment to be affected, the proposed project, the process followed to date (focussing on the outcome of the initial public participation process and baseline specialist studies), to present the site constraints identified by the various specialist, and to provide a Plan of Study for the Impact Assessment phase of this development. This draft scoping report is available to registered and potential I&AP's for review and comment.

This Draft Scoping Report is available for review and comment for a period of 30 Days extending from: **08 March 2022 – 08 April 2022.**

### 1.1 SCOPING STATEMENT

The outcome of this scoping report<sup>6</sup>, has not identified any fatal flaws associated with the development of the proposed Verbena PV Facility. The currently proposed footprint of the development may need to be adapted to avoid any sensitive features identified by the participating specialists during the EIA phase of the Environmental Process.

Subject to the outcome of the public participation process, it is Cape EAPrac's reasoned opinion that the project should proceed to the Environmental Impact Assessment phase of the environmental process.

### 1.2 OVERVIEW OF ALTERNATIVE ENERGY IN SOUTH AFRICA AND THE NORTHWEST.

According to the South African Energy Sector Report, 2019, the South African energy supply is dominated by coal which constituted 69% of the primary energy supply in 2016, followed by crude oil with 14% and renewables with 11%. Nuclear contributed 3% while natural gas contributed 3% to the total primary supply during the same period.

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<sup>6</sup> Including input from all specialists listed in section 5 of the summary.



As outlined in the IRP, 2019, the South African power system consists of various electricity generators including 38 GW installed capacity from coal, 1.8 GW from nuclear, 2.7 GW from pumped storage, 1.7 GW from hydro, 3.8 GW from diesel and 3.7 GW from renewable energy.

Globally, renewable energy has gained momentum, with a significant rise in the uptake of various Renewable Energy technologies such as solar PV, wind energy, biogas and other biofuels, hydroelectricity, landfill gas, geothermal energy, and concentrated solar power (CSP).

Ministerial determinations by the South African government to procure Renewable Energy — such as the Integrated Resource Plan (IRP), which lays out the country's electricity future — have given growth in the renewable energy sector a significant boost.

South Africa's green economy, partly driven by the country's utility-scale Renewable Energy Independent Power Production Procurement Programme (REIPPPP), reflects these trends and is leading the way in some areas.

This programme's primary mandate is to secure electrical energy from the private sector for renewable and non-renewable energy sources. With regard to renewables, the programme is designed to reduce the country's reliance on fossil fuels, stimulate an indigenous renewable energy industry and contribute to socio-economic development and environmentally sustainable growth. The IPPPP has been designed not only to procure energy but has also been structured to contribute to the broader national development objectives of job creation, social upliftment and broadening of economic ownership

According to Moody's, South Africa had the fastest growing green economy in the world in 2015. The REIPPPP, a key factor in this growth. By the end of June 2020, the REIPPPP had made the following significant impacts:

- 6 422MW of electricity had been procured from 112 RE Independent Power Producers (IPPs) in seven bid rounds.
- 4 276 MW of electricity generation capacity from 68 IPP projects has been connected to the national grid.
- 49 461GWh of energy has been generated by renewable energy sources procured under the REIPPPP since the first project became operational in November 2013.

In line with international experience, the price of renewable energy is increasingly cost competitive when compared with conventional power sources. The REIPPPP has effectively captured this global downward trend with prices decreasing in every bid window. Energy procured by the REIPPPP is progressively more cost effective and has approached a point where the wholesale pricing for new coal- and renewable-generated energy intersect. Through the competitive bidding process, the REIPPPP effectively leveraged rapid, global technology developments and price trends, buying clean energy at lower and lower rates with every bid cycle, resulting in SA getting the benefit of renewable energy at some of the lowest tariffs in the world. The price for wind power has dropped by 50% to R0.91/kWh, with the BW4 price directly comparable with the per kWh price of new coal generation. Solar PV has dropped most significantly with a price decrease of 75% to R1.10/kWh between BW1 and BW4<sup>7</sup>. This compares with the industry estimates in April 2020 of R1.45/kWh for Medupi. Considering the on-going delays in completion, indications are that these costs may even be significantly higher.

Beyond these successes, the programme and, consequently, the utility-scale Renewable Energy industry, is well positioned to continue contributing to South Africa's national development, as enshrined in the government's Strategic Infrastructure Projects (SIP) and the National Development Plan (NDP). The programme's socio-economic development (SED) and enterprise development (ED) mechanisms give successful project developers a unique opportunity to be competitive in their bidding strategy, while

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<sup>7</sup> The price in Bidding Window 5 has fallen even further. These figures are however not included here as none of the BW5 preferred bidders have reached financial close.

contributing meaningfully to the local and national economy. Project developers have fully embraced the SED/ED component of the REIPPPP, resulting in numerous inspiring contributions to priority areas on the government's developmental agenda. Among other areas, these contributions span community development, local economic development, skills development and early childhood development.

The recent uncertainties involving the state-owned utility, Eskom, highlight the need for reforms in an evolving energy sector, where electricity generation, transmission and distribution systems require unbundling. The interest from local municipalities in procuring Renewable Energy generation capacity from independent power producers (IPPs) contributes further to the shift in the structure of the country's power sector.

The introduction of private sector generation offers multiple benefits; it will contribute greatly to the diversification of both the supply and nature of energy production, assist in the introduction of new skills and in new investment into the industry, and enable the benchmarking of performance and pricing. The Department of Energy (DoE), National Treasury (NT) and the Development Bank of Southern Africa (DBSA) established the IPP Office for the specific purpose of delivering on the IPP procurement objectives. The REIPPPP is a competitive bidding process used by national government to procure Renewable Energy generation capacity in line with the national IRP for Electricity 2010-2030.

**NOTE:** It is the intention that Verbena PV will submit a bid under this REIPPPP, or other similar procurement programme.

### 1.3 ASSUMPTIONS & LIMITATIONS

This section provides a brief overview of *specific assumptions and limitations* having an impact on this environmental application process:

- It is assumed that the information on which this report is based (specialist studies and project information, as well as existing information) is **correct, factual and truthful**.
- The proposed development is **in line** with the statutory planning vision for the area (namely the local Spatial Development Plan as outlined in the SIA), and thus it is assumed that issues such as the cumulative impact of development in terms of character of the area and its resources, have been taken into account during the strategic planning for the area.
- It is assumed that all the relevant **mitigation and management measures** and agreements specified in this report, and future specialist reports and the Environmental Management Programme will be implemented in order to ensure minimal negative impacts and maximum environmental benefits.
- It is assumed that due consideration will be given to the **discrepancies in the digital mapping** (PV panel array layouts against possible constraints), caused by differing software programs, and that it is understood that the ultimate/final positioning of solar array will only be confirmed on-site with the relevant specialist/s where necessary.
- The Department of Water and Sanitation **will consider the submission of a water use application** necessary for allowing the use of water from any water resource on site. The assumption is made that water provision is to be obtained from the local municipality.
- It is assumed that Stakeholders and Interested and Affected Parties notified of the availability of this will submit all relevant **comments within the designated 30-days** review and comment period, so that these can included in the Final Scoping report to be timeously submitted to the competent authority, the Department of Forestry, Fisheries and the Environment, for consideration.

The assumptions and limitations of the various specialist studies are included in their respective reports attached in Appendix E.

## 2 PROPOSED ACTIVITY

The Applicant, Verbena PV (Pty) Ltd, is proposing the construction of a photovoltaic (PV) solar energy facility (known as the Verbena PV facility) located on a site approximately 10 km north west of the town of Lichtenburg in the North West Province. The solar PV facility will comprise several arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 100 MW. Please see the technical layout development report compiled by Verbena PV (Pty) Ltd attached in Annexure E7, from which the following is drawn.

The development area is situated within the Ditsobotla Local Municipality within the Ngaka Modiri Molema District Municipality and is accessible via the R505, located east of the development area.

Two additional 100 MW PV facilities (Euphorbia PV and Hillardia PV) are concurrently being considered on the project site (within Portion 2, Portion 3, and Portion 4 of the Farm Houthaalboomen 31) and are assessed through separate Environmental Impact Assessment (EIA) processes.

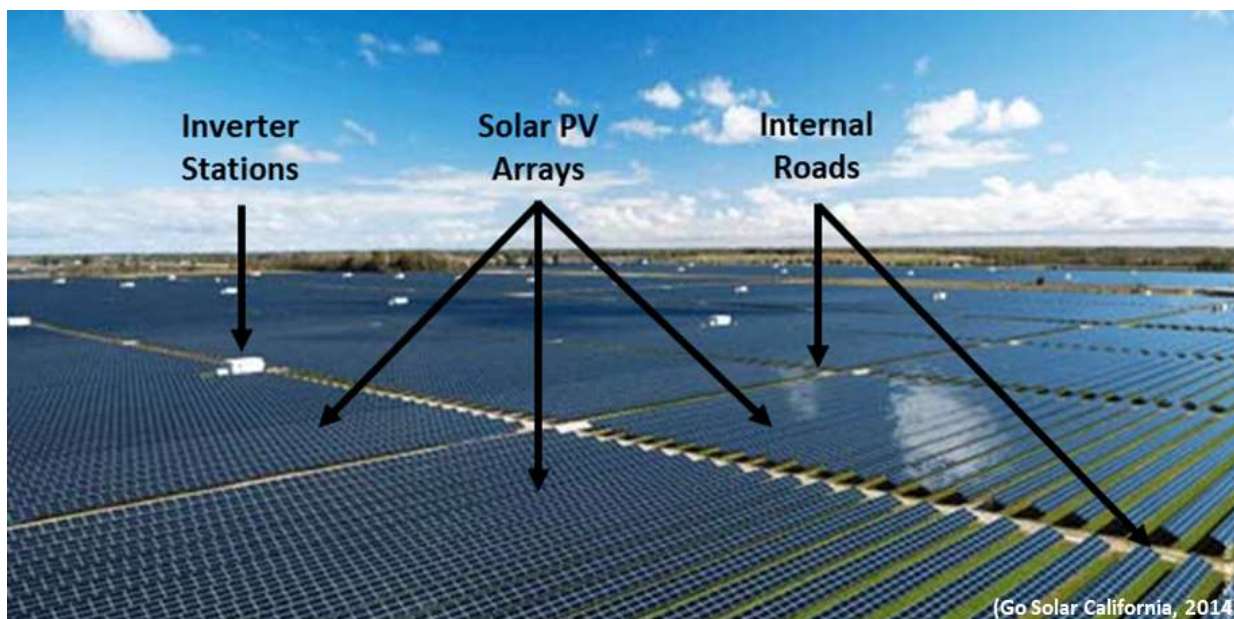
The development area for the PV facility and associated infrastructure will be located on the following properties:

- Portion 2 of the Farm Houthaalboomen 31
- Portion 3 of the Farm Houthaalboomen 31
- Portion 4 of the Farm Houthaalboomen 31

An assessment area of approximately 220 ha is being assessed as part of this EIA process and the infrastructure associated with the 100 MW facility includes:

- PV modules and mounting structures;
- Inverters and transformers;
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 8m wide);
- Auxiliary buildings (22kV or 33kV switch room, gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Temporary and permanent laydown area;
- Cabling between the panels, to be laid underground where practical; and
- Grid connection infrastructure, including:
  - Underground medium-voltage cabling between the project components and the facility substation (within a 100 m wide and  $\pm 1.5$  km in length corridor); and
  - Up to 132kV facility substation

The figure below depicts the typical layout of a solar PV Energy Facility.



**Figure 1:** Typical Layout of a Solar PV Energy Facility

Verbena PV will have a net generating capacity of 100 MW with an estimated maximum footprint of ± 220 ha. The approximate area that each component of Verbena PV will occupy is summarised in Table 1 below.

**Table 2:** Component Areas and % of Total Project Area

SEF Component	Estimated Area	% of Total Area (± 220 ha)	% of Study Area (602 ha)
PV array	± 181 ha	82,27%	30,07%
Permanent and construction laydown areas	Up to 5 ha	2,27%	0,83%
Auxiliary buildings	± 1 ha	2,27%	0,83%
Internal roads	± 8 ha	3,64%	1,33%
Substation	± 1 ha	0,45%	0,17%
MV cabling corridor	+ - 15 ha	6,82%	2,49%
Main Road	Approx. 5 ha	0,45%	0,17%
BESS	Up to 4 ha	1,82%	0,66%

## 2.1 PROJECT COMPONENTS AND INFRASTRUCTURE

The following key components and infrastructure will make up the proposed Verbena PV.

### 2.1.1 Solar array

Solar PV modules are connected in series to form a string. A number of strings are then wired in parallel to form an array of modules. PV modules are mounted on structures that are either fixed, north-facing at a defined angle, or mounted to a single or double axis tracker to optimise electricity yield.

### 2.1.2 Mounting structures

Various options exist for mounting structure foundations, which include cast/pre-cast concrete, driven/rammed piles, or ground/earth screws mounting systems. Due to the presence of ephemeral washes and secondary watercourses within the PV footprint, driven/rammed piles and earth screws are the preferred mounting technology.



**Figure 2:** Cast Concrete Foundation - alternative mounting (Verbena PV, 2022)



**Figure 3:** Driven/ Rammed Steel Pile (left) and Ground Screw (right) are the preferred mounting technology (Verbena PV, 2022)

The impact these options are considered to be similar, however concrete is least preferred due the effort required at a decommissioning phase in order to remove the concrete from the soil, and therefore its impact on the environment. The Verbena PV energy facility will therefore aim to make the most use of either driven/rammed piles, or ground/earth screws mounting systems, and only in certain instances resort to concrete foundations should geotechnical studies necessitate this.

### 2.1.3 Auxiliary buildings

The auxiliary buildings will comprise the following as a minimum:

- 33 kV switch room;
- Control building/ centre;
- Offices;



- Warehouses;
- Canteen & visitors centre;
- Staff lockers & ablution; and
- Gate-house and security.

The total area occupied is approximately 1 ha, excluding the facility switching station/ substation.

#### **2.1.4 Grid connection and cabling**

The Verbena PV grid connection infrastructure includes:

- Underground medium-voltage cabling between the project components and the facility substation (within a 100 m wide and  $\pm 1.5$  km in length corridor); and
- Up to 132kV facility substation.

The Verbena PV facility substation will be located directly adjacent to the Houthaalboomen North collector switching station in the south-eastern corner of Portion 4 of the Farm Houthaalboomen 31.

The Houthaalboomen North collector substation/ switching station will facilitate the connection of the cluster facility substations to the Watershed Main Transmission Substation (MTS) via a single or double circuit 132 kV overhead powerline. The connection infrastructure between the collector switching station and the MTS will be assessed as part of a separate Environmental Application.

#### **2.1.5 Access routes and internal roads**

Please also refer to section 2.5 where the various access road alternatives have been discussed in detail.

Existing access to the affected properties is via farm roads off the R503. For various reasons, the applicant considers this technically not feasible and is proposing access via the R505.

Three access road alternatives (ranging from approximately 2 – 4 km in length) have been identified and will be considered / screened during the scoping phase. A traffic specialist has been appointed to facilitate and guide the identification of technically feasible options which will be based on, amongst others, feasible access points and oversized vehicle / abnormal load constraints.

The majority of the access road will follow existing, gravel farm roads that may require widening up to 10 m (inclusive of storm water infrastructure). Where new sections of road need to be constructed (lengthened), this will be gravel/hard surfaced access road and only tarred if necessary.

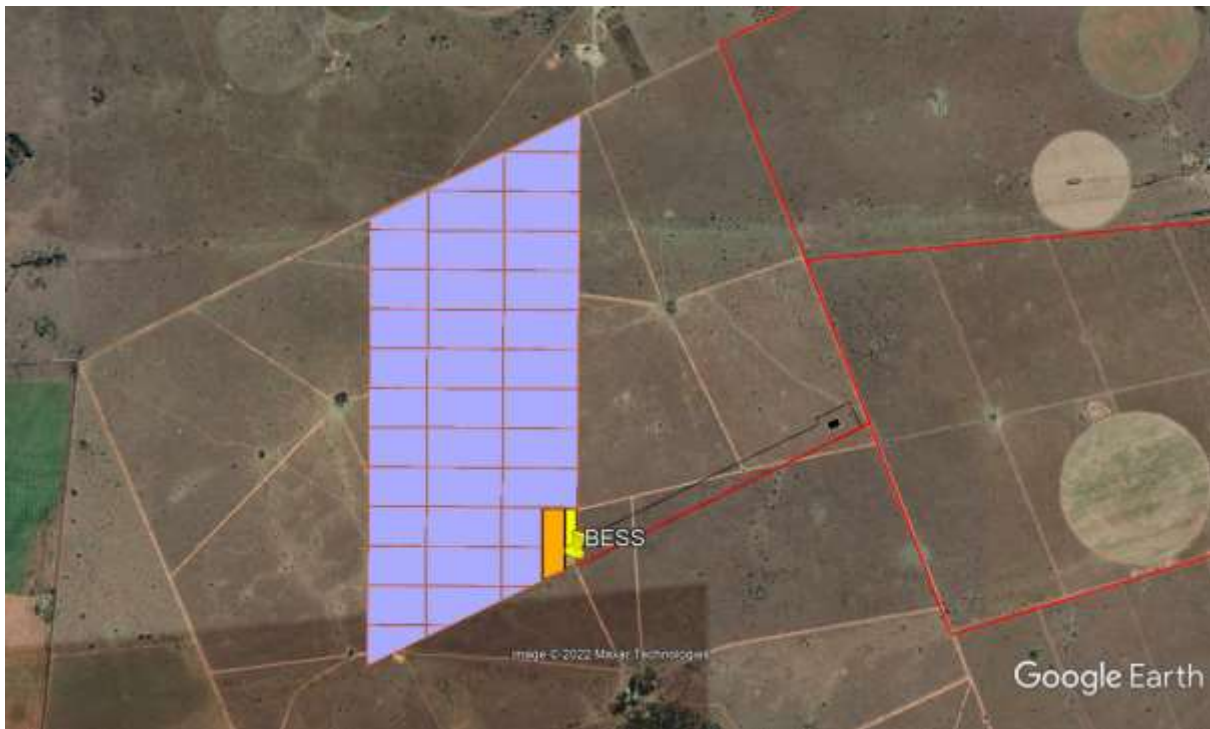
A network of gravel internal access roads and a perimeter road, each with a width of up to  $\pm 5$  m, will be constructed to provide access to the various components of the Verbena PV development.

A detailed transport and traffic study is currently being compiled for the project and will be included in the EIA Phase of the Environmental Process. Precautionary measures will be taken to mitigate the risk of ground disturbances where access roads will be constructed. Special attention will be given to drainage, water flow and erosion by applying appropriate building methods.

#### **2.1.6 Battery Storage Energy System.**

Please refer to the Battery Energy Storage Technical Report attached in Annexure E8 for further details on the proposed Battery Energy Storage System (BESS).

The proposal for Verbena PV includes the installation of an up to 4ha Battery storage component situated adjacent to the on-site substation.



**Figure 4:** Location of battery energy storage system in relation to the remaining components of Verbena PV.

As technological advances within battery energy storage systems (BESS) are frequent, two BESS technology alternatives are considered: Solid state battery electrolytes and Redox-flow technology.

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

Flow batteries use solid electrodes and liquid electrolytes. The most used flow battery is the vanadium Redox Flow Battery (VRFB), which is a type of rechargeable flow battery that employs vanadium ions in different oxidative states to store chemical potential energy.

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

Traditional utility-scale Li-ion battery storage facilities include the following main components:

- Battery cells → modules → packs → racking system (DC).
- Storage container (HVAC system, thermal management, monitors and controls, fire suppression, switchgear, and energy management system).
- Power conversion system (bidirectional inverter to convert AC to DC for battery charging and DC to AC for discharging).
- Transformer (to step up 480-V inverter output to 12–66 kV).

The figures below illustrates the components that generally make up the primary battery system.

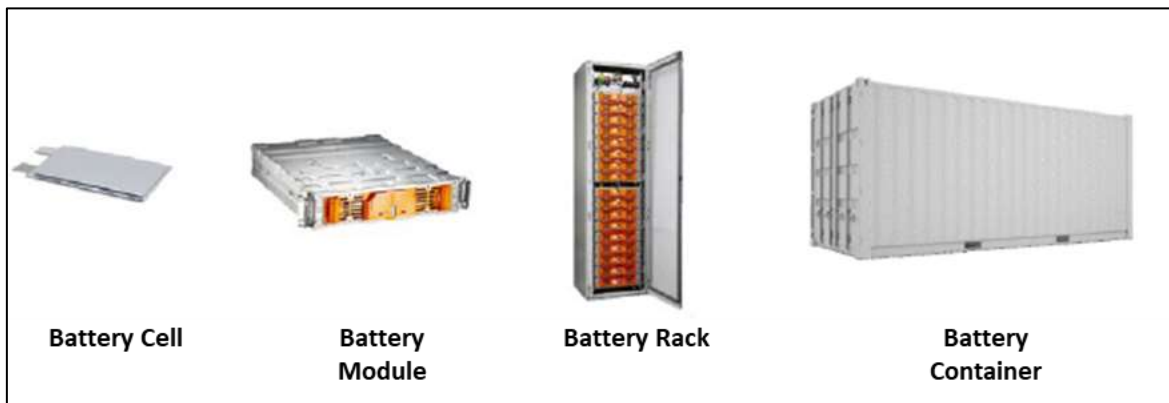


Figure 5: Typical Battery System Components.

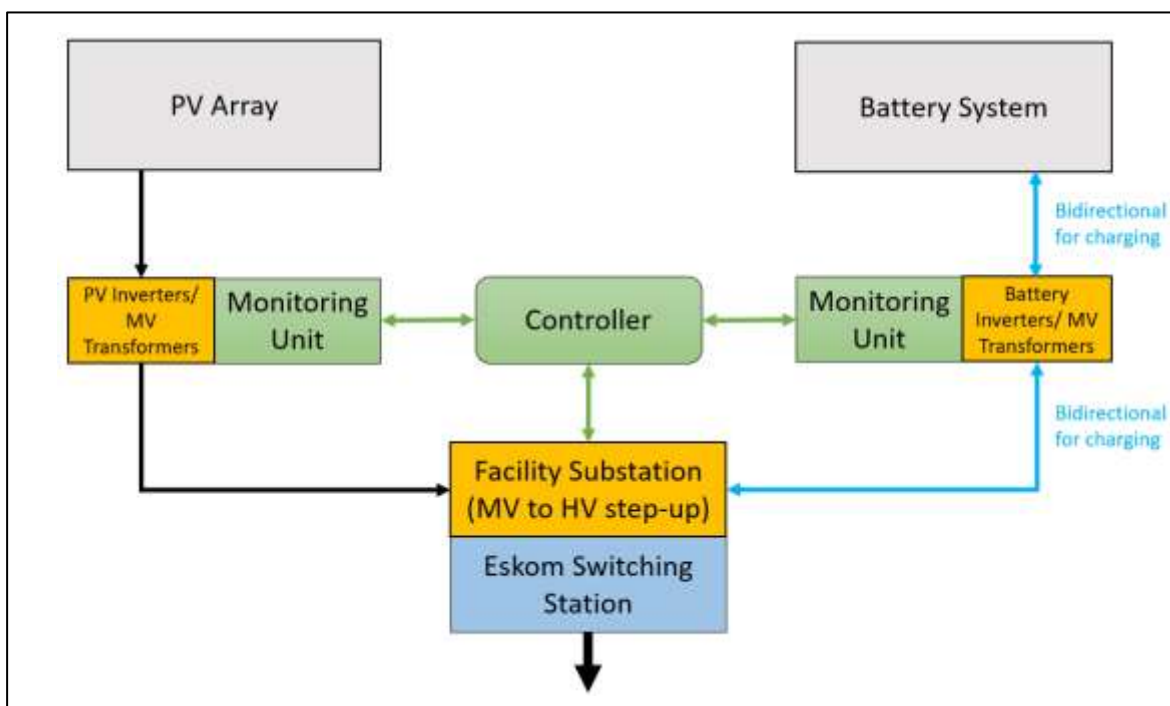


Figure 6: Typical flow diagram of PV plant with battery storage





**Figure 7:** Pivot Power's proposed 50MW lithium-ion battery in Kemsley, Kent.

The battery storage facility will be constructed on a 4ha footprint adjacent to the MV switching station substation as shown on the Site Location Plans in Appendix A.

## 2.2 EXTERNAL SERVICES.

The following external services will be required for the construction and operation of Verbena PV. Further details in this regard will be contained in the EIA phase of the Environmental Assessment Process.

### 2.2.1 Solid waste

Solid waste during the construction phase will mainly be in the form of construction material, excavated substrate and domestic solid waste. All waste will be disposed of in scavenger proof bins and temporarily placed in a central location for removal by the contractor. Any other waste will be removed once construction is complete and disposed of at a registered waste facility. Excess excavation material will either be spoiled offsite at a registered facility or used for landscaping berms within the overall PV footprint.

### 2.2.2 Sewerage

During the construction phase, chemical ablution facilities will be utilised. These ablution facilities will be maintained, serviced and emptied by an appointed contractor, who will dispose of the effluent at a licensed facility off site. Once construction is complete, the chemical ablution facilities will be removed from the study area. A conservancy tank which will be regularly emptied by a registered service provider will be installed at the Operations and Maintenance building.

### 2.2.3 Water

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

- The Local Municipality (LM) - Specific arrangements will be agreed with the Ditsobotla Local Municipality in a Service Level Agreement (SLA). Most likely the water will be either trucked in, or otherwise made available for collection at their Water Treatment Plant via a metered standpipe.

- Investigation into a third-party water supplier which may include a private services company.
- The investigation of drilling a borehole on site, which includes complete geohydrological testing, groundwater census and a Water Use License Application (WULA) in terms of section 21a of the National Water Act, 1998.

#### **2.2.4 Hazardous substances**

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

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

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

### **2.3 PROJECT NEED AND DESIRABILITY**

In keeping with the requirements of an integrated Environmental Impact process, the DEA&DP<sup>8</sup> *Guidelines on Need and Desirability (2010 & 2011)* were referenced to provide the following estimation of the activity in relation to the broader societal needs. The concept of need and desirability can be explained in terms of its two components, where *need* refers to *time* and *desirability* refers to *place*. Questions pertaining to these components are answered in the Sections below.

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

#### **2.3.1 Feasibility consideration**

The commercial feasibility for the proposed 100MW<sub>AC</sub> Verbena PV to be built on private land near Lichtenburg, has been informed by its contextual location, and economic, social and environmental impacts and influence. The project has gathered sufficient information and once specialist assessments are completed in the EIA phase, the EAP will be able to make qualified and reliable assumptions on the project's various impacts.

#### **2.3.2 Solar Resource & Energy Production**

The economic viability of a solar PV facility is directly dependent on the annual solar irradiation at the site. From a regional site selection perspective, this region is considered to be preferred for solar energy development by virtue of its annual solar irradiation values. The GHI for the area derived from the World Bank Group's Global Solar Atlas is approximately 2 143 kWh/m<sup>2</sup>/annum.

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<sup>8</sup> The Western Cape Provincial guidelines on Need and Desirability were considered in the absence of National and North West Province Guidelines.

### **2.3.3 Solar Farm & Grid Connection**

Ease of access into the Eskom electricity grid is vital to the viability of a solar PV facility. Projects which are in close proximity to a connection point and/or demand centre are favourable, and reduce the losses associated with power transmission. The proximity of the site to the existing Eskom Watershed MTS allows for a feasible connection point.

### **2.3.4 Social impact**

Please refer to the baseline social assessment in Annexure E6 for a detailed description of the social environment.

Power generation is one of the rare growth opportunities for the North West Province due to the high solar irradiation levels and its strategic position relative to the National Transmission Network. This setup creates growth opportunities for the area and the establishment of a renewable energy project is considered important to diversify and complement the economic development of the region.

### **2.3.5 Employment & Skills Transfer**

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

Verbena PV will have a positive impact on local employment. During the estimated 18 month construction phase, the project will employ approximately 300 – 400 individuals of various qualifications. The majority will be provided by the local labour market. During operations, Verbena PV is expected to have up to 60 employment opportunities ranging from security staff to administration and artisans. Due to the fact that there is limited local skilled labour in the field of renewable energy, the employment structure will likely consist of local and outside capacity. To guarantee successful operations over the lifetime of the investment, Verbena PV will likely use the skills of outside labour to cross-train local specialists. This cross training and skills development will take place especially in the area of technical maintenance and administration.

## **2.4 SITE SELECTION PROCESS**

Please refer to the Site Selection Matrix attached in Annexure E9, from which the following is drawn.

The identification of the affected properties for the development of Verbena PV was based on the following location characteristics.

### **2.4.1 Proximity to towns with a need for socio-economic upliftment**

The proposed cluster is situated approximately 10 km north-west of the town of Lichtenburg in the North West Province within the jurisdiction of the Ditsobotla Local Municipality (DLM).

The DLM Integrated Development Plan IDP identifies a number of key challenges facing the Municipality, including poverty, high levels of unemployment and skills shortages.

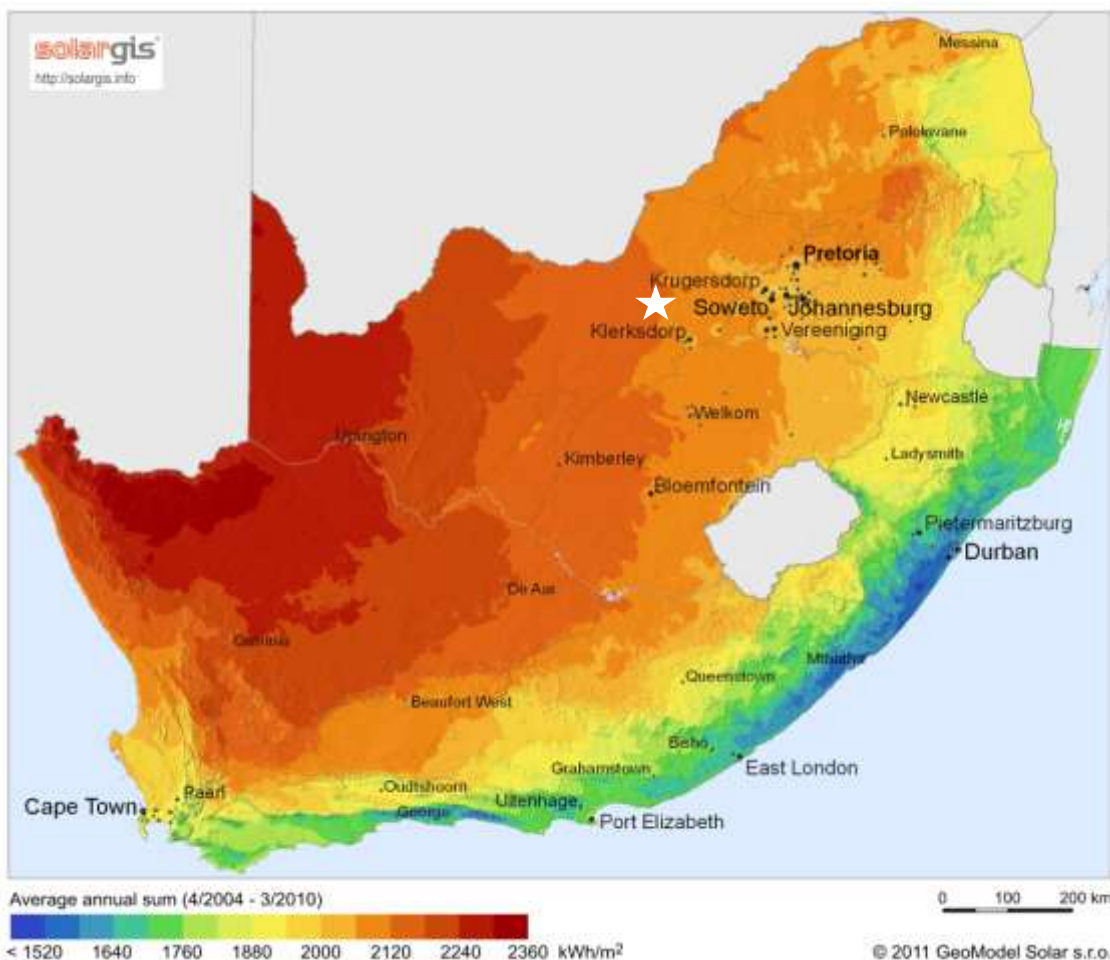
Due to the close proximity to Lichtenburg town, local labour and service providers would be easy to source, which fits in well with the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) economic development criteria for socio-economic upliftment.

In this regard the development has the potential to support private sector investment and create employment and skills development opportunities.

### 2.4.2 Solar Irradiation

The economic viability of a solar PV facility is directly dependent on the annual solar irradiation at the site. From a regional site selection perspective, this region is considered to be preferred for solar energy development by virtue of its annual solar irradiation values. The GHI for the area derived from the World Bank Group’s Global Solar Atlas is approximately 2 143 kWh/m<sup>2</sup>/annum.

The irradiation level is an important factor in a highly competitive bidding environment under REIPPPP; the economic viability of a project is a critical success factor.



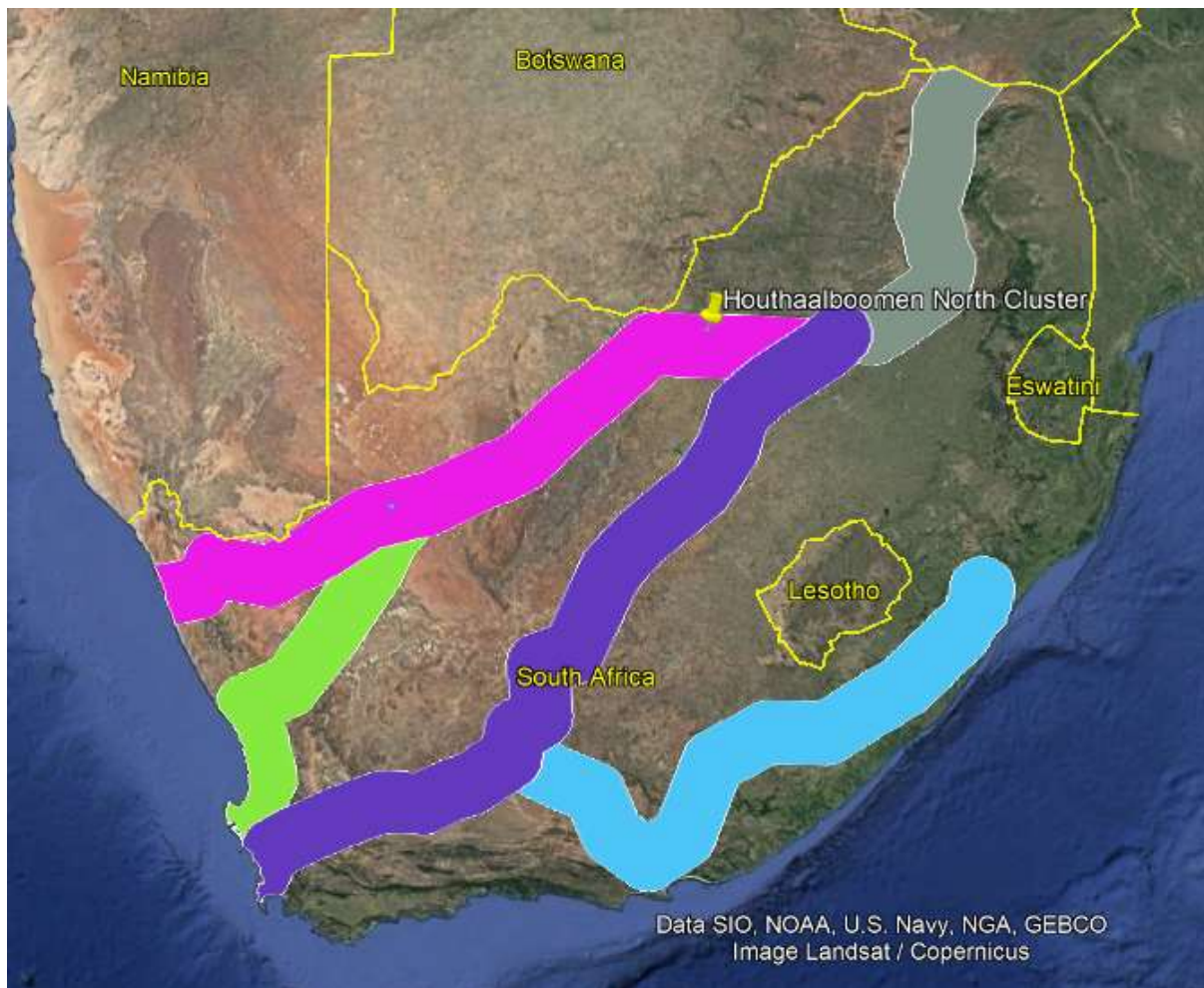
**Figure 8:** Global Horizontal Irradiation of Verbena PV (Verbena PV, 2022)

### 2.4.3 Access to grid

Ease of access into the Eskom electricity grid is vital to the viability of a solar PV facility. Projects which are in close proximity to a connection point and/or demand centre are favourable, and reduce the losses associated with power transmission. In addition, Eskom’s ‘2040 Transmission Network Study’ has drawn on various scenarios to determine the grid’s development requirements, as well as to identify critical power corridors for future strategic development.

The national power corridors consisting of five transmission power corridors of 100 km in width have been gazetted by the Department of Forestry, Fisheries and the Environment (DFFE) following the outcome of the strategic environmental assessment (SEA) which aimed to identify environmentally acceptable routes over which long-term environmental impact assessment (EIA) approvals can be secured. The Verbena PV falls into the Northern corridor as shown in the figure below.





**Figure 9:** Eskom “Critical Power” Corridors. Verbena PV is located within the North corridor as shown by the yellow pin (Verbena PV, 2022)

The Watershed MTS (i.e. the Eskom Substation to which the project will connect) forms part of the North West supply area, and more specifically, the Carletonville local area.

With the exception of Mookodi and Pluto, the North West supply area has transformation capacity at all the substations, and furthermore, has available transfer capacity at all the substations.

#### 2.4.4 Current Land Use

The current land use of the site is extensive livestock farming with cattle. The available grazing consists of natural veld and there are no planted pastures and no grass harvesting and baling.

The surrounding land uses include irrigated and rainfed production of grain crops to the west and north of the site while the areas located east and south of the site are used for livestock farming.

#### 2.4.5 Proximity to access road for transportation of material and components

The development area can be accessed via the R505 existing regional road. As material and components would need to be transported to the project site during the construction phase of the project, the accessibility of the site was a key factor in determining the viability of the project, particularly taking transportation costs (direct and indirect) into consideration and the impact of this on project economics and therefore the ability to submit a competitive bid under the Department of Energy’s (DoE) REIPPPP.

## 2.4.6 Landowner support

The selection of a site where the landowner is supportive of the development of renewable energy is essential for ensuring the success of the project. The support from the landowner for the development to be undertaken on the affected property has been solidified by the provision of the consent for the project to proceed on the property through the signing of an option to lease agreement with the developer.

## 2.4.7 Footprint selection Process

The footprint selection process (i.e. the selection of the final development footprint within the assessed area) will take place after the scoping phase, once all participating specialists have completed their detailed assessments. A final mitigated alternative will be developed, based on this footprint selection process.

## 2.5 CONSIDERATION OF ALTERNATIVES

Verbena PV will consist of solar PV technology with fixed, single, or double axis tracking mounting structures, with a net generation (contracted) capacity of 100MW<sub>AC</sub> as well as associated infrastructure, which will include:

- PV modules and mounting structures;
- Inverters and transformers;
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 8m wide);
- Auxiliary buildings (22kV or 33kV switch room, gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Temporary and permanent laydown area;
- Cabling between the panels, to be laid underground where practical; and
- Grid connection infrastructure, including:
  - Underground medium-voltage cabling between the project components and the facility substation (within a 100 m wide and ±1.5 km in length corridor); and
  - Up to 132kV facility substation

The specialists have all undertaken their baseline assessments and once they have completed their detailed site assessments, the engineering team will refine the current layout alternatives to provide a preferred mitigated alternative that will be presented in the EIA phase of the environmental process.

### 2.5.1 Layout Alternatives

For the purpose of the EIA phase of the environmental process, site layout alternatives will not be comparatively assessed, but rather a single layout (within the selected site) will be refined through additional specialist input and stakeholder engagement.

Following further site screening by the avifaunal and biodiversity specialist (scheduled to take place during the EIA phase), the development footprint<sup>9</sup> will be finalised for impact assessment.

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<sup>9</sup> The development footprint is the defined area (located within the development area) where the PV panel array and other associated infrastructure for Verbena PV facility is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed.



**Figure 10:** Verbena PV Assessment Area (white) & Development Area (yellow)

### 2.5.2 Access Route Alternatives

The site will be accessible via the regional road R505 located to the east of the project site.

Three access road route options have been identified based on existing access to the project site and landowner support. A traffic specialist has been appointed to facilitate and guide the identification of technically feasible options which will be based on, amongst others, feasible access points and oversized vehicle / abnormal load constraints.





**Figure 11:** Verbena PV Access Route Alternatives

### 2.5.3 The no-go alternative

The no-go Alternative (or status quo) proposes that Verbena PV not go ahead and that the area in proximity to the Watershed MTS remain undeveloped as it is currently. The land on which the Verbena PV is proposed is currently vacant..

The no-go alternative will limit the potential associated with the land and the area as a whole for ensuring energy security locally, as well as the meeting of renewable energy targets on a provincial and national scale. Should the no-go alternative be considered, the positive impacts associated with Verbena PV (increased revenue for the farmer, economic investment, local employment and generation of electricity from a renewable resource) will not be realised.

The no-go alternative is thus not considered a favourable option in light of the benefits associated with the proposed Verbena PV, however it will be used as a baseline from which to determine the level and significance of potential impacts associated with the proposed Verbena PV.

## 3 LEGISLATIVE AND POLICY FRAMEWORK

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



### 3.7 NATIONAL LEGISLATION

This section deals with nationally promulgated or nationally applicable legislation associated with the proposed Verbena PV<sup>10</sup>.

#### 3.7.1 The Constitution of the Republic of South Africa

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

The Constitution and Bill of Rights provides that:

Everyone has the right:

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

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

#### 3.7.2 National Environmental Management Act (NEMA)

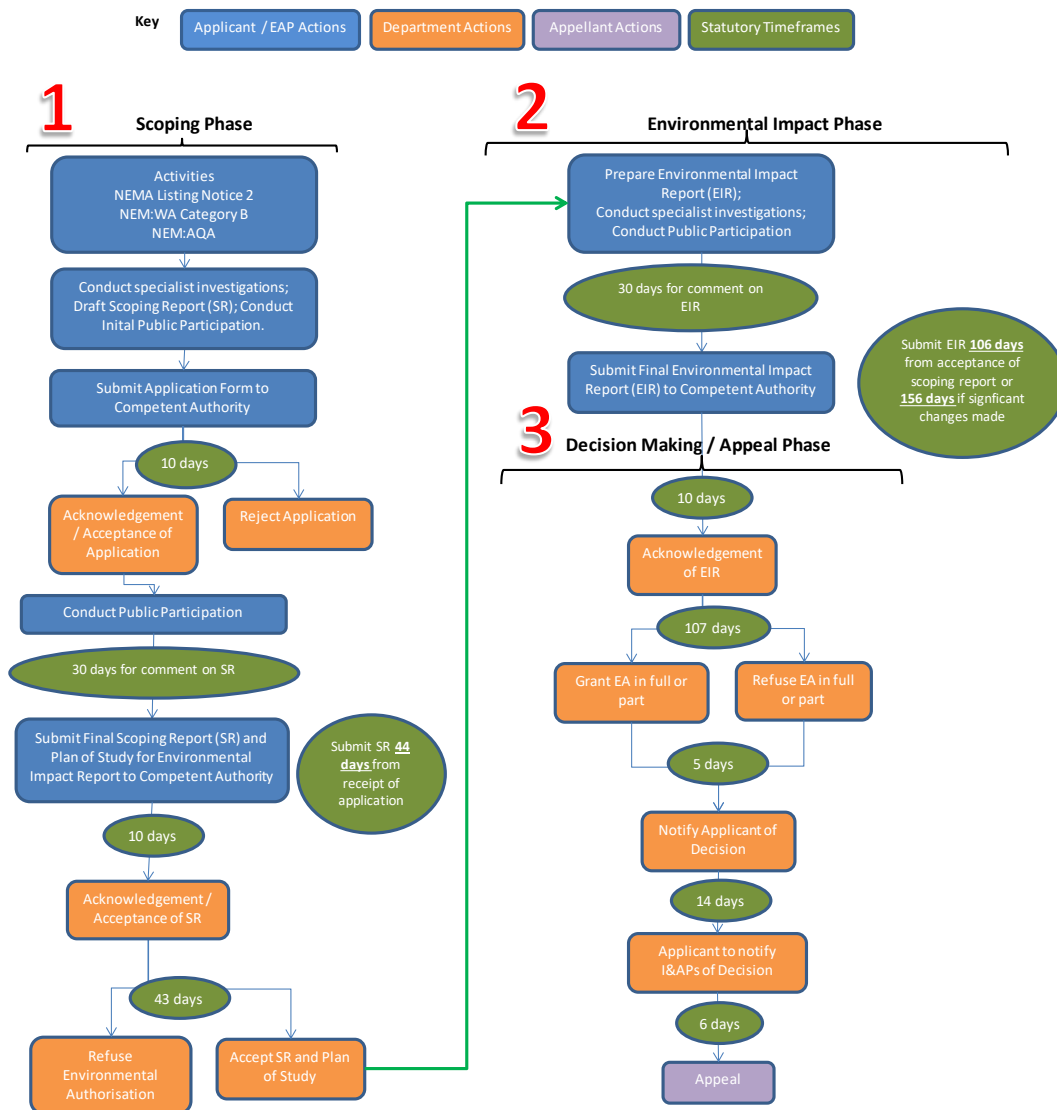
The current assessment is being undertaken in terms of the **National Environmental Management Act (NEMA, Act 107 of 1998)**<sup>11</sup>. This Act makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the competent authority (in this case, the national Department of Forestry, Fisheries and the Environment, (DFFE) based on the findings of an Environmental Assessment.

The proposed development entails a number of listed activities, which require a **Scoping & Environmental Impact Reporting (S&EIR) process**, which must be conducted by an independent environmental assessment practitioner (EAP). Cape EAPrac has been appointed to undertake this process. Figure 2 below depicts a summary of the S&EIR process.

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<sup>10</sup> This section has been prepared with input from the Social Specialist.

<sup>11</sup> The Minister of Water and Environmental Affairs promulgated new regulations in terms of Chapter 5 of the National Environmental Management Act (NEMA, Act 107 of 1998), viz, the Environmental Impact Assessment (EIA) Regulations 2014 (as amended in April 2017). These regulations came into effect on 08 December 2014 (amended on 07 April 2017) and replace the EIA regulations promulgated in 2006 and 2010.



**Figure 12:** Summary of Scoping & EIR Process in terms of the 2014 Regulations.

The listed activities associated with the proposed development, as stipulation under 2014 Regulations 327, 325 and 324 are as follows:

**Table 3:** NEMA 2014 (As amended in April 2017) listed activities applicable to Verbena PV.

Listed activity as described in GN R.983, 984 and 985	Description of project activity that triggers listed activity
<b>Regulation GN R. 983 – Basic Assessment</b>	
<b>GNR 983 Item 11:</b> The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	The proposal includes MV cabling of up to 33 Kilovolts and an on-site (facility) facility substation with a capacity of up to 132 kilovolts.
<b>GNR 983 Item 24:</b> 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;	The proposed main access road to Verbena PV will be up to 8m wide, but with the inclusion of side drains and gavel embankments, will exceed the threshold of this activity.
<b>GNR 983 Item 28:</b> Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian	The proposed Verbena PV development is considered to be commercial use and the total footprint size will exceed 1 hectare.

Listed activity as described in GN R.983, 984 and 985	Description of project activity that triggers listed activity
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;	
<b>GNR 983 Item 56:</b> 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;	The existing access road from the R505 will be lengthened by more than 1km in order to reach Verbena PV.
<b>Regulation GN R. 984 - Scoping and Environmental Impact Reporting</b>	
<b>GNR 984 Item 1:</b> .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 Verbena PV will have a generation capacity of up to 100 megawatts.
<b>GNR 984 Item 15:</b> The clearance of an area of 20 hectares or more of indigenous vegetation.	The proposed Verbena PV will require the clearance of an area in excess of 20ha and as such exceeds the threshold of this activity.
<b>Regulation GN R. 985 – Basic Assessment</b>	
<b>GNR 985 Item 4:</b> The development of a road wider than 4 metres with a reserve less than 13,5 metres. h. North West vi. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve;;	This activity may be applicable pending the confirmation of the legislative status of the Lichtenberg Game Breeding Centre which is situated approximately 3.6km to the East of Verbena PV access road.
<b>GNR 985 Item 18:</b> The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. h. North West ii. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve;	This activity may be applicable pending the confirmation of the legislative status of the Lichtenberg Game Breeding Centre which is situated approximately 3.6km to the East of Verbena PV access road.

**NOTE:** Basic Assessment as well as Scoping and Environmental Impact Reporting Activities are being triggered by the proposed development and as such, the Environmental Process will follow a Scoping and Environmental Impact Reporting process.

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

Before any of the above mentioned listed activities can be undertaken, authorisation must be obtained from the relevant authority, in this case the National Department of Forestry, Fisheries and the Environment (DFFE). Should the Department approve the proposed activity, the Environmental Authorisation does not exclude the need for obtaining relevant approvals from other Authorities who have a legal mandate in respect of the proposed development.

### 3.7.3 National Environmental Management: Biodiversity (ACT 10 OF 2004)

The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered

(EN), vulnerable (VU) or protected. The Draft National List of Threatened Ecosystems (Notice 1477 of 2009, Government Gazette No 32689, 6 November 2009) has been gazetted for public comment.

The list of threatened terrestrial ecosystems supersedes the information regarding terrestrial ecosystem status in the NEMBA 2004. In terms of the EIA regulations, a basic assessment report is required for the transformation or removal of indigenous vegetation in a critically endangered or endangered ecosystem if more than 300 square metres are transformed..

NEMBA also deals with endangered, threatened and otherwise controlled species. The Act provides for listing of species as threatened or protected, under one of the following categories:

- **Critically Endangered:** any indigenous species facing an extremely high risk of extinction in the wild in the immediate future.
- **Endangered:** any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species.
- **Vulnerable:** any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species.
- **Protected species:** any species which is of such high conservation value or national importance that it requires national protection. Species listed in this category include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

According to the Terrestrial Ecology Specialist (Annexure E1), the project does not traverse any threatened or protected ecosystem and the closest Critically Endangered vegetation unit, Western Highveld Sandy Grassland is approximately from the project area.

Certain activities, known as Restricted Activities, are regulated by a set of permit regulations published under the Act. These activities may not proceed without environmental authorization.

According to the national vegetation map (Mucina & Rutherford 2006), the vegetation on site is mapped as **Carletonville Dolomite Grassland**. According to the terrestrial ecologist, this vegetation type occurs on slightly undulating plains dissected by prominent rocky chert ridges. Species-rich grasslands forming a complex mosaic pattern dominated by many species. This vegetation type occurs in the North-West, Gauteng and marginally into the Free State Province: In the region of Potchefstroom, Ventersdorp and Carletonville, extending westwards to the vicinity of Ottoshoop, but also occurring as far east as Centurion and Bapsfontein in Gauteng Province.

This vegetation type is classified as VU, according to the NBA (2018) this vegetation type is classified as **Least Concern**. The national target for conservation protection for both these vegetation types is 24%, but only a small extent is conserved in statutory (Sterkfontein Caves — part of the Cradle of Humankind World Heritage Site, Oog Van Malmanie, Abe Bailey, Boskop Dam, Schoonspruit, Krugersdorp, Olifantsvlei, Groenkloof) and in at least six private conservation areas. Almost a quarter already transformed for cultivation, by urban sprawl or by mining activity as well as the building of the Boskop and Klerkskraal Dams.

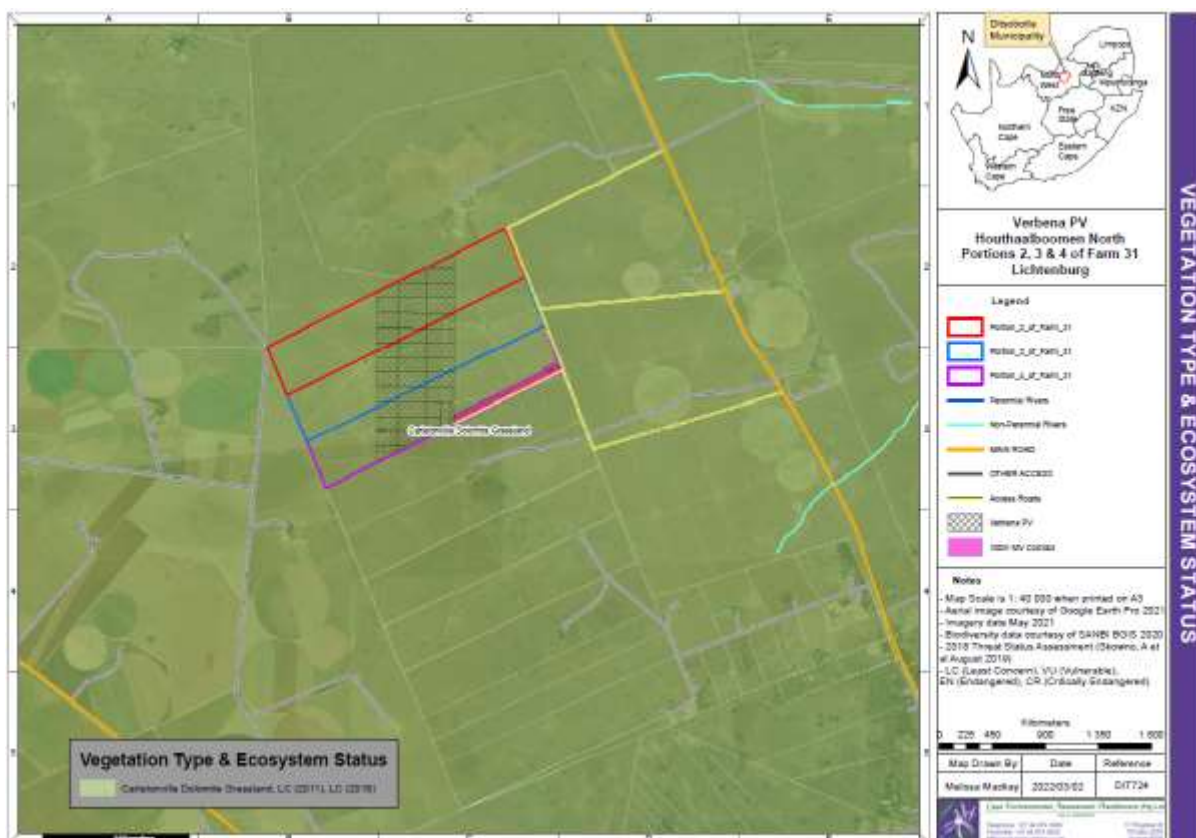


Figure 13: Broad-scale overview of the vegetation on and in proximity to Verbena PV.

### 3.7.4 National Environmental Protected Areas Act (NEMPAA) (Act 57 of 2003)

The National Environmental Management: Protected Areas Act 57 of 2003 intends to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes.

It furthermore provides for the establishment of a national register of all national, provincial and local protected areas.

The plan below the protected areas in proximity to the site (as per the SACaD and SAPaD datasets, third quarter 2021). In addition to those protected areas shown on the plan below, the Lichtenburg Game Breeding Centre is situated to the East of Verbena PV. The Lichtenburg Game Breeding Centre is indicated as an informal nature reserve on the SANBI BGIS System. The status of the Lichtenburg Game Breeding Centre in terms of NEMPAA still needs to be determined.



The ecological specialist has confirmed that a *Vachellia erioloba* may be present on the site. This will be confirmed in the Environmental Impact Assessment phase of the Environmental Process.

Please refer to the **Ecological Scoping Report** in **Annexure E1** for a detailed description of the protected species on the site.

### **3.7.7 Conservation of Agricultural Resources Act – CARA (Act 43 of 1983):**

CARA provides for the regulation of control over the utilisation of the natural agricultural resources in order to promote the conservation of soil, water and vegetation and provides for combating weeds and invader plant species. The Conservation of Agricultural Resources Act defines different categories of alien plants:

- Category 1 - prohibited and must be controlled;
- Category 2 – must be grown within a demarcated area under permit; and
- Category 3 - ornamental plants that may no longer be planted, but existing plants may remain provided that all reasonable steps are taken to prevent the spreading thereof, except within the flood lines of water courses and wetlands.

The abundance of alien plant species on Verbena site is very low, which can be ascribed mainly current land use of the site (maintained for extensive livestock grazing).

The Department of Agriculture, Land Reform and Rural Development is guided by Act 43 of 1983.

In order to comply with their mandate in terms of this legislation, the developer is required to take note of the following:

Article 7.(3)b of Regulation 9238: CONSERVATION OF AGRICULTURE RESOURCES, 1983 (Act 43 of 1983)

Utilisation and protection of vleis, marshes, water sponges and water courses

- 7.(1) “no land user shall utilize the vegetation in a vlei, marsh or water sponge or within the flood area of a water course or within 10 meters horizontally outside such flood area in a manner that causes or may cause the deterioration of or damage to the natural agriculture resources.”
- (3)(b) “cultivate any land on his farm unit within the flood area of a water course or within 10 meters horizontally outside the flood area of a water course”.

As confirmed by the Freshwater Ecologist, there are no watercourses on or adjacent to the site.

### **3.7.8 National Heritage Resources Act**

The protection and management of South Africa’s heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999). South African National Heritage Resources Agency (SAHRA) is the enforcing authority in the Northwest Province, and is registered as a Stakeholder for this environmental process.

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

The National Heritage Resources Act requires relevant authorities to be notified regarding this proposed development, as the following activities are relevant:

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- any development or other activity which will change the character of a *site* exceeding 5 000 m<sup>2</sup> in extent;

- the re-zoning of a site exceeding 10 000m<sup>2</sup> in extent.

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

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

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

Mr Jaco van der Walt, of Beyond Heritage, has baseline assessment for the proposed Verbena PV (Annexure E4). This integrated heritage study has included an Paleontological Assessment undertaken by Prof Marion Bamford.

These baseline assessments will be submitted to SAHRA simultaneously with this DSR for input and guidance on further requirements.

### **3.7.9 National Water Act, NO 36 OF 1998**

Section 21c & i of the National Water Act (NWA) requires the Applicant to apply for authorisation from the Department of Water and Sanitation for an activity in, or in proximity to any watercourse. Such an application would be required for any access road or PV infrastructure that crosses any watercourse.

The Ecology Specialist (Annexure E1) has confirmed that there are no watercourses or wetlands on or adjacent to the study site.

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

Water required for the construction and operation of Verbena PV is to be sourced from the Ditsobotla Local Municipality. In future, should the project consider abstraction from a water resource for the purposes of construction or operating of the facility, such abstraction will likely require a licence in terms of Section 21(a) of the NWA.

The Department of Water and Sanitation have been registered as a key stakeholder in this environmental process.

### **3.7.10 Astronomy Geographic Advantage Act, 2007 (Act No 21 Of 2007)**

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

The closest SKA declared area is approximately 500km South West of the Site (SKA004). Considering the distance, the project is unlikely to have any impact on the SKA.

**The South African SKA Project Office** and **SARAO** have been registered as a key stakeholder on this environmental process and will be requested to provide comment and input in terms of the Astronomy Geographic Advantage Act and potential impact to SKA.



### 3.7.11 National Energy Act (Act No 34 of 2008)

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

“To ensure that diverse energy resources are available, in sustainable quantities, and at affordable prices, to the South African economy, in support of economic growth and poverty alleviation, taking into account environmental management requirements (...); to provide for (...) increased generation and consumption of renewable energies...”(Preamble).

### 3.7.12 National Infrastructure Plan

The South African Government adopted a National Infrastructure Plan in 2012. The aim of the plan is to transform the economic landscape while simultaneously creating significant numbers of new jobs and strengthening the delivery of basic services. The plan also supports the integration of African economies. In terms of the plan, Government will invest R827 billion over the next three years to build new and upgrade existing infrastructure. The aim of the investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to improved economic growth.

As part of the National Infrastructure Plan, Cabinet established the Presidential Infrastructure Coordinating Committee (PICC). The Committee identified and developed 18 strategic integrated projects (SIPs). The SIPs cover social and economic infrastructure across all nine provinces (with an emphasis on lagging regions) and consist of:

Five geographically-focussed SIPs.

- Three spatial SIPs.
- Three energy SIPs.
- Three social infrastructure SIPs.
- Two knowledge SIPs.
- One regional integration SIP.
- One water and sanitation SIP.

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

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

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

#### SIP 9: Electricity generation to support socio-economic development

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

#### SIP 10: Electricity transmission and distribution for all

- Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development.

- Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity.
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### 3.7.13 White Paper on the Energy Policy of the Republic of South Africa

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

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

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

Government policy on renewable energy is thus concerned with meeting the following challenges:

- Ensuring that economically feasible technologies and applications are implemented.
- Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options; and,
- Addressing constraints on the development of the renewable industry.

The White Paper also acknowledges that South Africa has neglected the development and implementation of renewable energy applications, despite the fact that the country’s renewable energy resource base is extensive, and many appropriate applications exist.

The White Paper also notes that renewable energy applications have specific characteristics that need to be considered. Advantages include:

- Minimal environmental impacts in operation in comparison with traditional supply technologies; and
- Generally lower running costs, and high labour intensities.

Disadvantages include:

- Higher capital costs in some cases.
- Lower energy densities.
- Lower levels of availability, depending on specific conditions, especially with sun and wind-based systems.

### 3.7.14 White Paper on Renewable Energy

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

The White Paper notes that while South Africa is well endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely

untapped. As signatory to the Kyoto Protocol, Government is determined to make good the country's commitment to reducing greenhouse gas emissions. To this purpose, Government has committed itself to the development of a framework in which a national renewable energy framework can be established and operate.

South Africa is also a signatory of the Copenhagen Accord, a document that delegates at the 15th session of the Conference of Parties (COP 15) to the United Nations Framework Convention on Climate Change agreed to "take note of" at the final plenary on 18 December 2009. The accord endorses the continuation of the Kyoto Protocol and confirms that climate change is one of the greatest challenges facing the world. In terms of the accord South Africa committed itself to a reduction target of 34% compared to business as usual. In this regard, the IRP 2010 aims to allocate 43% of new energy generation facilities in South Africa to renewables.

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

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

### **3.7.15 Integrated Energy Plan (2016)**

The development of a National Integrated Energy Plan (IEP) was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and, in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and, on an annual basis, review and publish the IEP in the Government Gazette. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development.

The IEP notes that South Africa needs to grow its energy supply to support economic expansion and in so doing, alleviate supply bottlenecks and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process, eight key objectives were identified, namely:

- Objective 1: Ensure security of supply.
- Objective 2: Minimise the cost of energy.
- Objective 3: Promote the creation of jobs and localisation.
- Objective 4: Minimise negative environmental impacts from the energy sector.
- Objective 5: Promote the conservation of water.
- Objective 6: Diversify supply sources and primary sources of energy.
- Objective 7: Promote energy efficiency in the economy.
- Objective 8: Increase access to modern energy.

The IEP provides an assessment of current energy consumption trends within different sectors of the economy (i.e., agriculture, commerce, industry, residential and transport) and uses this information to identify future energy requirements, based on different scenarios. The scenarios are informed by different assumptions on economic development and the structure of the economy and also consider the impact of key policies such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others.

Based on this information the IEP then determines the optimal mix of energy sources and technologies to meet those energy needs in the most cost-effective manner for each of the scenarios. The associated environmental impacts, socio-economic benefits and macroeconomic impacts are also analysed. The

IEP is therefore focused on determining the long-term energy pathway for South Africa, taking into account a multitude of factors which are embedded in the eight objectives.

As part of the analysis four key scenarios were developed, namely the Base Case, Environmental Awareness, Resource Constrained and Green Shoots scenarios:

- The Base Case Scenario assumes that existing policies are implemented and will continue to shape the energy sector landscape going forward. It assumes moderate economic growth in the medium to long term.
- The Environmental Awareness Scenario is characterised by more stringent emission limits and a more environmentally aware society, where a higher cost is placed on externalities caused by the supply of energy.
- The Resource Constrained Scenario in which global energy commodity prices (i.e. coal, crude oil and natural gas) are high due to limited supply;
- The Green Shoots Scenario describes an economy in which the targets for high economic growth and structural changes to the economy, as set out in the National Development Plan (NDP), are met.

The IEP notes that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources. In terms of renewable energy, the document refers to wind and solar energy. The document does however appear to support solar over wind noting that solar PV and CSP with storage present excellent opportunities to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Solar technologies also present the greatest potential for job creation and localisation. Incentive programmes and special focused programmes to promote further development in the technology, as well as solar roll-out programmes, should be pursued.

In terms of existing electricity generation capacity, the IEP indicates that existing capacity starts to decline notably from 2025, with significant plant retirement occurring in 2031, 2041 and 2048. By 2050 only 20% of the current electricity generation capacity remains. As a result, large investments are required in the electricity sector in order to maintain an adequate supply in support of economic growth.

By 2020, various import options become available, and some new coal capacity is added along with new wind, solar and gas capacity. The mix of generation capacity technologies by 2050 is considerably more diverse than the current energy mix, across all scenarios. The main differentiating factors between the scenarios are the level of demand, constraints on emission limits and the carbon dioxide externality costs.

In all scenarios the energy mix for electricity generation becomes more diverse over the period to 2050, with coal reducing its share from about 85% in 2015 to 15–20% in 2050 (depending on the scenario). Solar, wind, nuclear, gas and electricity imports increase their share. The Environmental Awareness and Green Shoots scenarios take on higher levels of renewable energy.

An assessment of each scenario against the eight objectives with reference to renewable energy notes while all scenarios seek to ensure that costs are minimised within the constraints and parameters of each scenario, the Base Case Scenario presents the least cost followed by the Environmental Awareness, Resource Constrained and Green Shoots scenarios respectively when total energy system costs are considered.

In terms of promoting job creation and localisation potential, the Base Case Scenario presents the greatest job creation potential, followed by the Resource Constrained, Environmental Awareness and Green Shoots scenarios respectively. In all scenarios, approximately 85% of total jobs are localisable. For electricity generation, most jobs result from solar technologies followed by nuclear and wind, with natural gas and coal making a smaller contribution.

The Environmental Awareness Scenario, due to its stringent emission constraints, shows the lowest level of total emissions over the planning horizon. This is followed by the Green Shoots, Resource Constrained and Base Case scenarios. These trends are similar when emissions are considered cumulatively and individually by type.

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

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

- The REIPP Procurement Programme should be extended, and new capacity should be allocated through additional bidding windows in order ensure the ongoing deployment of renewable energy technologies.
- Experience and insights gained from the current procurement process should be used to streamline and simplify the process.
- The implementation of REIPP projects in subsequent cycles of the programme should be aligned with the spatial priorities of provincial and local government structures in the regions that are selected for implementation, in line with the Spatial Development Frameworks. This will ensure that there is long-term, sustainable infrastructure investment in the areas where REIPP projects are located. Such infrastructure includes bulk infrastructure and associated social infrastructure (e.g., education and health systems). This alignment will further assist in supporting the sustainable development objectives of provincial and local government by benefiting local communities.

### **3.7.16 Integrated Resource Plan**

The integrated resource plan (IRP) is an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost. On 6 May 2011, the Department of Energy (DoE) released the Integrated Resource Plan 2010-2030 (IRP 2010) in respect of South Africa's forecast energy demand for the 20-year period from 2010 to 2030. The IRP 2010 was intended to be a 'living plan' that would be periodically revised by the DoE. However, this was never done and resulted in an energy mix that failed to adequately meet the constantly changing supply and demand scenarios in South Africa, nor did it reflect global technological advancements in the efficient and responsible generation of energy.

On 27 August 2018, the then Minister of Energy published a draft IRP which was issued for public comment (Draft IRP). Following a lengthy public participation and consultation process the Integrated Resource Plan 2019 (IRP 2019) was gazetted by the Minister of Mineral Resources and Energy, Gwede Mantashe, on 18 October 2019, updating the energy forecast for South Africa from the current period to the year 2030. The IRP is an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost.

Since the promulgated IRP 2010, the following capacity developments have taken place. A total 6 422MW under the government led Renewable Energy Independent Power Producers Programme (RE IPP Procurement Programme) has been procured, with 3 876MW currently operational and made available to the grid. In addition, IPPs have commissioned 1 005MW from two Open Cycle Gas Turbine (OCGT) peaking plants. Under the Eskom build programme, the following capacity has been commissioned: 1 332MW of Ingula pumped storage, 1 588MW of Medupi, 800MW of Kusile and 100MW of Sere Wind Farm. In total, 18 000MW of new generation capacity has been committed to.

Provision has been made for the following new additional capacity by 2030:

- 1 500MW of coal.

- 2 500MW of hydro.
- 6 000MW of solar PV.
- 14 400MW of wind.
- 1 860MW of nuclear.
- 2 088MW for storage.
- 3 000MW of gas/diesel.
- 4 000MW from other distributed generation, co-generation, biomass and landfill technologies.

As indicated above, the changes from the Draft IRP capacity allocations see an increase in solar PV and wind, and a significant decrease in gas and diesel; and new inclusions include nuclear and storage.

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

### 3.7.17 National Development Plan

The National Development Plan (NDP) contains a plan aimed at eliminating poverty and reducing inequality by 2030. The NDP identifies 9 key challenges and associated remedial plans. Managing the transition towards a low carbon national economy is identified as one of the 9 key national challenges. Expansion and acceleration of commercial renewable energy is identified as a key intervention strategy.

### 3.7.18 The New Growth Path Framework

The aim of the New Economic Growth Path Framework is to enhance growth, employment creation and equity. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard, the framework identifies investments in five key areas namely: energy, transport, communication, water and housing.

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

### 3.7.19 DFFE Screening Tool and Protocols

A screening tool report was generated for the proposed Verbena PV. The outcomes of the various environmental themes sensitivity as well as the level of study required by the protocols, are summarised in the table below.

**Table 4:** Sensitivity of the environmental themes and studies to be undertake in terms of these sensitivities

Environmental Theme	Sensitivity	Required investigation	Discussion / Compliance
Agriculture Theme	High	Agricultural Impact Assessment	An Agricultural Impact Assessment will be undertaken as part of the

Environmental Theme	Sensitivity	Required investigation	Discussion / Compliance
			EIA process as outlined in the Plan of Study for EIA.
Animal Species Theme	Low	Animal Species Compliance statement	This will form part of the detailed Biodiversity Impact Assessment
Aquatic Biodiversity Theme	Very High	Aquatic Impact Assessment	An Aquatic Impact Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA
Archaeological and Cultural Heritage Theme	Very High	Heritage Impact Assessment	An Agricultural Impact Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA
Avian Theme	High	Avifaunal Impact Assessment	An Avifaunal Impact Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA
Civil Aviation (Solar PV) Theme	Medium	Compliance Statement	The South African Civil Aviation Authority will be provided an opportunity to comment in this regard.
Landscape (Solar) Theme	Very High	Visual and Landscape Impact Assessment	A Visual Impact Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA
Plant Species Theme	Medium	Compliance Statement	This will form part of the detailed Biodiversity Impact Assessment
RFI Theme	Medium	Compliance Statement	The South African Square Kilometre Array SKA-SA and SARAO will be requested to provide professional comment in this regard.
Terrestrial Biodiversity Theme	Very High	Terrestrial Biodiversity Impact Assessment	An Aquatic Impact Assessment will be undertaken as part of the EIA process as outlined in the Plan of Study for EIA

The table below reflects the specialist studies recommended in the DEA Screening tool and whether they will be included in the Draft EIR.

**Table 5:** Specialist Studies recommended in the DEA Screening Tool.

Study Recommended	Discussion
Agricultural Impact Assessment	To be undertaken
Landscape/Visual Impact Assessment	To be undertaken
Archaeological and Cultural Heritage Impact Assessment	To be undertaken
Palaeontology Impact Assessment	To be undertaken
Terrestrial Biodiversity Impact Assessment	To be undertaken
Aquatic Biodiversity Impact Assessment	To be undertaken

Avian Impact Assessment	To be undertaken
Civil Aviation Assessment	Not to be undertaken - The South Avian Civil Aviation Authority will be approached to provide input in this regard.
Defense Assessment	Not to be undertaken – the South African National Defence Force will be approached to provide input in this regard.
RFI Assessment	Not to be undertaken – The South African Square Kilometre Array (SA SKA) will be approached to provide comment in this regard.
Geotechnical Assessment	Not to be undertaken – The Council for Geoscience will be approached for comment in this regard.
Socio-Economic Assessment	To be undertaken
Plant Species Assessment	To be undertaken
Animal Species Assessment	To be undertaken

### 3.8 PROVINCIAL LEGISLATION

This section deals with provincially promulgated or provincially applicable legislation associated with the proposed Verbena PV<sup>12</sup>.

#### 3.8.1 North West Provincial Growth and Development Strategy (2004-2014)

The North West Provincial Provincial Growth and Development Strategy (PGDS) was drafted in 2004 and aims to provide a framework for the 10-year period up to 2014. The PGDS is aligned with amongst others, the United Nations endorsed Millennium Development Goals and Objectives 2015, and the 2003 National Spatial Perspective. The PGDS largely relies on Census 2001 for demographic and other statistical data and is therefore dated. An up-dated version does not appear to be available.

The PGDS notes that the North West Province is a medium-size province, covering ~10% of the total national surface area, accounting for ~ 8% of the national population, and contributing ~ 7% to the national economy. Except for the mining sector (~23.5% of provincial GDP in 2002), private sector activity in the NWP is very modest. Other development challenges include low population densities (largely rural province); inadequate infrastructure, and enormous service delivery backlogs; a predominantly poor population with high levels of illiteracy and dependency; great inequalities between rich and poor, and disparities between urban and rural; and the HIV/Aids pandemic.

Both the primary immediate and long term objectives of the PGDS are therefore to address poverty and unemployment, while simultaneously improving the low level of expertise and skills.

The following cross-supporting economic development pillars support the NWP's economic growth and development strategy up to 2014:

- Growth and Investment.
- Agricultural and Rural Development.
- Mining and Energy.
- Manufacturing.

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<sup>12</sup> The legislative context outlined in this section was undertaken with input from the Social and Ecological Specialist.



- Tourism.
- Construction and Infrastructure.
- SMMEs.
- Training and Skills Development.

The mining and energy pillar focuses mainly on beneficiation, Mining Charter compliance, small-scale mining opportunities and addressing mine decommissioning impacts. Renewable energy and solar energy facilities are not addressed under this pillar or within the PGDS. In terms of the tourism pillar, the PGDS notes that the province faces a host of challenges, including infrastructural and transport connectivity. According to the PGDS, provincial government's objectives are to diversify its tourism industry through promoting cultural tourism and the entertainment and hospitality industries, to build human capital amongst tour operators, and to promote heritage sites as international tourism destinations. Sectoral growth targets, aimed at directing investment in the NWP while fostering employment creation, are outlined in the PGDS. The Transport and communication sector (seen as key to unlocking other sectors) is specifically singled out for growth. Deliberate provision is made for a more diversified future economy, in which tourism and manufacturing would play an increasingly important role.

SMME development is identified as key vehicle for meeting the dual challenges of growth and equitability, with an envisaged added potential for job creation, albeit currently often in the informal sector. The PGDS envisages that 60-80% of all future economic activities in provincial agriculture, mining, manufacturing, trade, and tourism should be SMME focused, but indicates that policy would ultimately be aligned with evolving national policy.

Skills development and training are identified as key enabling factors for labour market access. It is envisaged that skills development should constitute part of a broader, integrated effort at promoting job creation, and that the focus should be on growing skills and vocational training, mainly in the services and financial sectors. Companies would be encouraged to promote employee development through on-the-job learning and learner ships. The development of a focused Adult Basic Education and Training (ABET) strategy is envisaged to address high illiteracy levels, and to facilitate further education and training (FET).

### **3.8.2 Renewable Energy Strategy for the North West Province (2012)**

The Renewable Energy Strategy (RES) notes that the North West Province is the fourth largest electricity consuming province in South Africa (12%). The bulk of electricity is currently obtained from conventional coal-fired plants in Mpumalanga. Approximately 63% of the electricity supplied to the NWP is consumed in its mining sector. Many rural communities within the NWP are affected by energy poverty – a legacy of historic neglect and underdevelopment – and make use of wood fuel, with impacts on the environment and health. At the same time, the emerging renewables sector holds potential for employment creation, green manufacturing, and commercial energy generation (linked to the IPP). The key objectives of the RES are therefore to:

- Reduce the North West Province's contribution to climate change;
- alleviate energy poverty; and
- Promote economic development and job creation in the province by developing a green economy.

Various renewable energy source options were investigated in the RES. Solar (photovoltaic as well as solar water heaters), Municipal Solid Waste, hydrogen and fuel cell technologies, biomass, and energy efficiency were identified as sub-sectors/ sources which hold the greatest competitive potential in the NWP.

With regard to solar, the RES notes that the NWP has a very good potential with daily average solar radiation rates of greater than 8 000 MJ/m<sup>2</sup>. Only the Northern Cape Province (NCP) receives more radiation than the NWP.

During the status quo assessment no barriers to the generation and use of solar PV systems within the NWP were identified, except for the only slightly lower levels of solar irradiation levels compared to the NCP and parts of Limpopo. The RES notes that this could potentially be offset by sufficient economies of scale. The NWP has sufficient land area available, and the electricity grid infrastructure is good in the areas of high economic activity and in the proximity of the numerous mines and related large industries concentrated in certain areas of the NWP. The infrastructure in the NWP is also generally good in the same areas. This implies that, although the NWP is not a preferred destination for Solar PV projects, it can be made one if some of the general barriers are removed for project developers by the Province.

Based on the above, for following key actions are proposed for the NWP with regard to Solar PV:

- Identify a suitable entity linked to the NWPG to drive the opportunities associated with solar PV projects under the RE IPP.
- The NWP should initiate a project as part of the implementation plan to identify suitable areas within the NWP which complies with the following requirements:
  - Suitable and proven measured levels of solar irradiation.
  - Long-term lease or option agreements possible.
  - Good grid infrastructure in close proximity.
  - Suitable connection point into the electricity grid.
  - Low impact on agriculture and environment.
  - Suitable access to and around site for effective execution.
  - In close proximity to communities that could benefit from local economic development and job creation.
- The NWPG should also explore the possibility of packaging the most suitable and viable land areas for solar PV project developers to attract them to the NWP.
- The NWP should focus on developing the local content of components for the PV industry.

### **3.8.3 Northwest Biodiversity Sector Plan.**

According to the Northwest Biodiversity Sector Plan (NW BSP), the project area traverses a terrestrial ESA level 1. These ESA 1 areas function as linkages/corridors (comprising of natural vegetation) between the important biodiversity areas and major freshwater resource and their fringing terrestrial habitats. The management mandate for ESA 1 is to maintain at least a semi-natural state and basic natural attributes.

The NW BSP depicts the project area as overlapping with an area regarded as an Aquatic ESA1. These are modelled freshwater resource features. The significance of the project on these features will be assessed by the Terrestrial and Freshwater Ecologists during the Environmental Impact Assessment Phase of the Environmental Process.

The freshwater Ecologist has confirmed that the project area is not crossed by rivers or wetlands on the desktop level and that these ESA1 areas are most likely groundwater recharge areas.

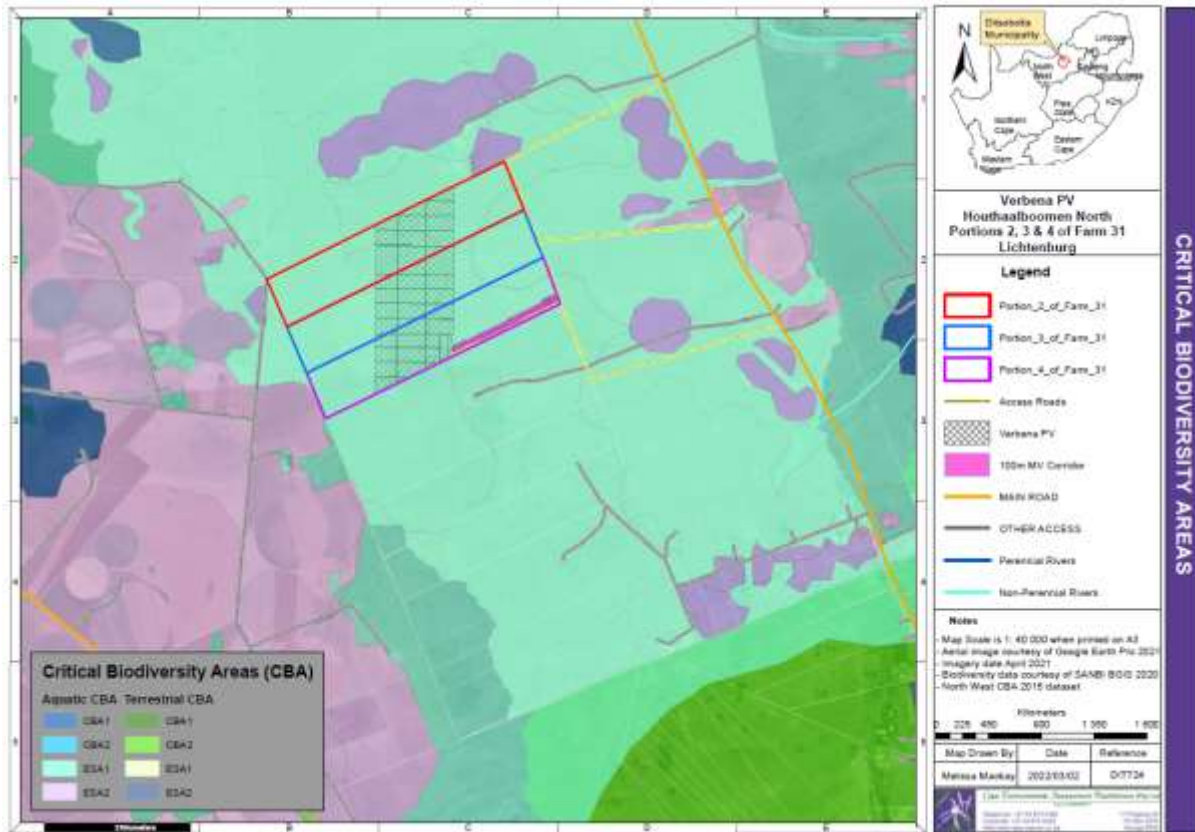


Figure 15: Extract of Northwest Biodiversity Sector Plan.

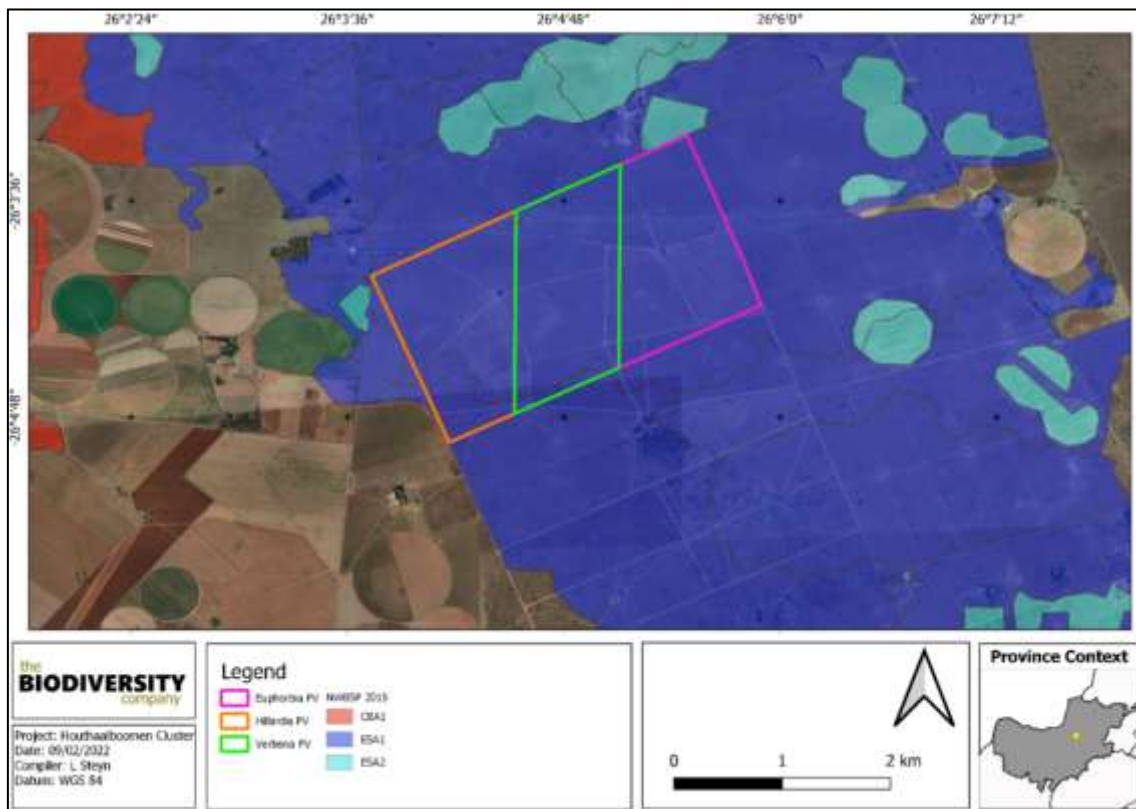
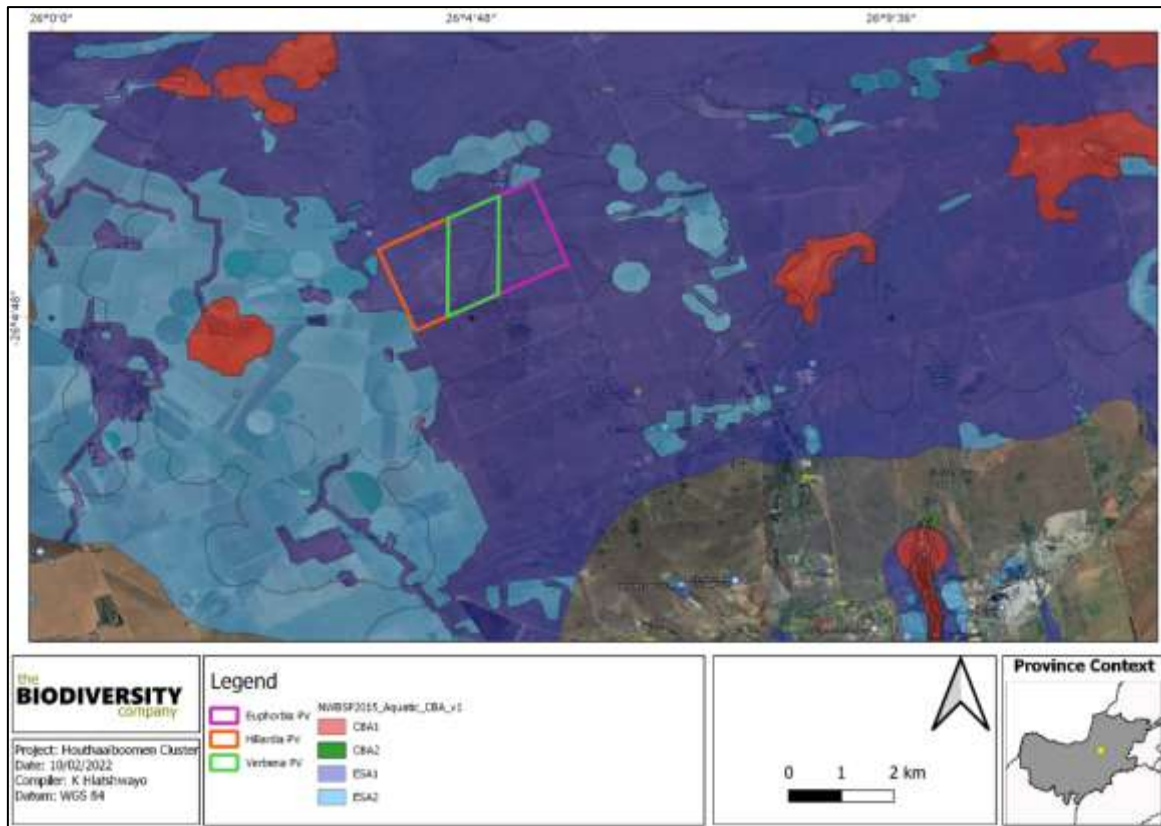


Figure 16: Map illustrating the Terrestrial CBA's and ESA's in relation to the study area (The Biodiversity Company 2022).



**Figure 17:** Map illustrating the Aquatic CBA's and ESA's in relation to the Study Area (The Biodiversity Company 2022).

### 3.9 GUIDELINES, POLICIES AND AUTHORITATIVE REPORTS

This section includes relevant Guidelines, Policies and Authoritative reports applicable to the proposed Verbena PV.

#### 3.9.1 Ngaka Modiri Molema District Municipality Integrated Development Plan

The vision for the Ngaka Modiri Molema District Municipality (NMMDM) as set out in the IDP (2021/2022) is “Leaders in integrated municipal governance”. The mission statement that underpins the vision is “To provide a developmental municipal governance system for a better life for all.”

The strategic development objectives listed in the IDP are aligned to the National KPA's for Local Government. These include:

- Institutional Transformation and Organisational Development.
- Provision of Infrastructure for Basic Service Delivery.
- To promote Infrastructure Development and Maintenance.
- Economic Development.
- Financial Viability.
- Good Governance.

Economic Development is relevant to the development. The IDP notes that the objective is to facilitate economic development by:

- Creating a conducive environment for business development.

- Unlocking opportunities to increase participation amongst all sectors of society in the mainstream economy to ultimately create decent job opportunities.
- Promoting Local Economic Development.
- Enhancing rural development and agriculture.
- Expanding the Public Works Programme

A District Growth and Development Strategy aimed at improving the livelihood and economic growth of the Ngaka Modiri Molema community has been developed. The key pillars of the strategy that are relevant to the project include:

- Economic development.
- Job creation.
- Skills development.
- Manufacturing and Small Business Development.
- Investment Promotion.

### **3.9.2 Ditsobotla Municipality Integrated Development Plan**

The vision for the Ditsobotla Municipality (DM) as set out in the IDP (2021/2022) is “A developmental municipality dedicated to the social and economic upliftment of its communities.” The mission statement that underpins the vision is “Sustainable service delivery through transparent administration; dedicated staff; implementation of municipal programmes; and consultation with communities.”

The IDP identifies a number of key challenges facing the Municipality, including poverty, high levels of unemployment and skills shortages. In order to address these challenges, the DM is committed to creating an environment that is conducive to economic growth, sustainable employment opportunities and growth in personal income levels of communities.

Section E of the IDP lists the strategic objectives, key performance indicators, targets and projects. The key performance areas include:

- Municipal Transformation and Organisational Development.
- Municipal Financial Viability and Management.
- Local Economic Development.
- Basic Services and Infrastructure Development.
- Good Governance and Public Participation.

Local economic development is relevant to the project. In this regard the development has the potential to support private sector investment and create employment and skills development opportunities. These issues can be addressed by SED and ED spend linked to the project.

### **3.9.3 Environmental Impact Assessment Guideline For Renewable Energy Projects**

The Minister of Environmental Affairs published the Environmental Impact Assessment Guideline for Renewable Energy in terms of section 24J of the National Environmental Management Act, 1998 (Act No. 107 of 1998) on 16 October 2016.

In pursuit of promoting the country’s Renewable Energy development imperatives, the Government has been actively encouraging the role of Independent Power Producers (IPPs) to feed into the national grid. Through its REIPPPP, the DoE has been engaging with the sector in order to strengthen the role of

IPPs in renewable energy development. Launched during 2011, the REIPPPP is designed so as to contribute towards a target of 3 725MW, and towards socio-economic and environmentally sustainable development, as well as to further stimulate the renewable industry in South Africa.

In order to facilitate the development of the first phase of IPPs in South Africa, these guidelines have been written to assist project planning, financing, permitting, and implementation for both developers and regulators. The guideline is principally intended for use by the following stakeholder groups:

- Public Sector Authorities (as regulator and/or competent authority);
- Joint public sector authorities and project funders, e.g., Eskom, IDC, etc.
- Private Sector Entities (as project funder/developer/consultant);
- Other interested and affected parties (as determined by the project location and/or scope).

This guideline aims to ensure that all potential environmental issues pertaining to renewable energy projects are adequately and timeously assessed and addressed as necessary so as to ensure sustainable roll-out of these technologies by creating a better understanding of the environmental approval process for renewable energy projects.

The guidelines list the following possible environmental impacts associated with the development of solar energy facilities.

**Table 6:** Potential environmental impacts of solar energy projects (Adapted from DFFE, 2015) showing where they have been considered in this report

Impact Description	Relevant Legislation	Applicability to this project
Visual Impact	NEMA	Specialist input attached in Annexure E5.
Noise Impact (CSP)	NEMA	Not applicable, as CSP is not considered as a technology alternative.
Land Use Transformation (fuel growth and production)	NEMA, NEMPAA, NHRA	Not Applicable to PV. Agricultural specialist input however attached in Annexure E3
Impacts on Cultural Heritage	NEMA, NHRA	Heritage impact assessment attached in Annexure E4.
Impacts on Biodiversity –	NEMA, NEMBA, NEMPAA, NFA	Biodiversity specialist input attached in Annexure E1 (Inclusive of both Freshwater and Terrestrial Biodiversity)
Impacts on Water Resources –	NEMA, NEMICMA, NWA, WSA	The project will obtain water directly from the local municipality. A freshwater ecologist has assessed the potential impacts on freshwater resources (Annexure E1).
Hazardous Waste Generation (CSP and PV)	NEMA, NEMWA, HAS	The EMPr makes provision for damaged and defunct PV infrastructure for dismantling and re-use.
Electromagnetic Interference	NEMA	The closest SKA declared area is approximately 500km South West of the Site (SKA004). Considering the distance, the project is unlikely to have any impact on the SKA. SKA and SARA0 have however been given an opportunity to provide comment in this regard.
Aircraft Interference	NEMA, MSA	The SA CAA have been automatically registered as an interested and affected party on this environmental process. There are no airports nor landing strips in the vicinity of the proposed site.
Loss of Agricultural Land	SALA	Agricultural specialist input is attached in Annexure E3



Impact Description	Relevant Legislation	Applicability to this project
Sterilisation of mineral resources	MPRDA	The Department of Mineral Resources has been registered as an I&AP on this environmental process.

Assuming an IPP project triggers the need for BA or S&EIR under the EIA regulations, included in the assessment process is the preparation of an environmental management programme (EMPr). Project-specific measures designed to mitigate negative impacts and enhance positive impacts should be informed by good industry practice and are to be included in the EMPr. Potential mitigation measures for solar energy projects include but are not limited to:

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

The recommendations of these guidelines have been explicitly considered in S&EIR process where necessary and additional specialist input has been obtained.

### 3.9.4 Sustainability Imperative

The norm implicit to our environmental law is the notion of sustainable development (“SD”). SD and sustainable use and exploitation of natural resources are at the core of the protection of the environment. SD is generally accepted to mean development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The evolving elements of the concept of SD *inter alia* include the right to develop; the pursuit of equity in the use and allocation of natural resources (the principle of intra-generational equity) and the need to preserve natural resources for the benefit of present and future generations. Economic development, social development and the protection of the environment are considered the pillars of SD (the triple bottom line).

“Man-land relationships require a holistic perspective, an ability to appreciate the many aspects that make up the real problems. Sustainable planning has to confront the physical, social, environmental and economic challenges and conflicting aspirations of local communities. The imperative of sustainable planning translates into notions of striking a balance between the many competing interests in the ecological, economic and social fields in a planned manner. The ‘triple bottom line’ objectives of sustainable planning and development should be understood in terms of economic efficiency (employment and economic growth), social equity (human needs) and ecological integrity (ecological capital).”

As was pointed out by the Constitutional Court, SD does not require the cessation of socio-economic development but seeks to regulate the manner in which it takes place. The idea that developmental and environmental protection must be reconciled is central to the concept of SD - it implies the accommodation, reconciliation and (in some instances) integration between economic development, social development and environmental protection. It is regarded as providing a “conceptual bridge” between the right to social and economic development, and the need to protect the environment.

Our Constitutional Court has pointed out that the requirement that environmental authorities must place people and their needs at the forefront of their concern so that environmental management can serve their developmental, cultural and social interests, can be achieved if a development is sustainable. “*The very idea of sustainability implies continuity. It reflects the concern for social and developmental equity between generations, a concern that must logically be extended to equity within each generation. This concern is reflected in the principles of inter-generational and intra-generational equity which are embodied in both section 24 of the Constitution and the principles of environmental management contained in NEMA.*” [Emphasis added.]

In terms of NEMA sustainable development requires the integration of the relevant factors, the purpose of which is *to ensure that development serves present and future generations.*<sup>13</sup>

It is believed that the proposed 100MW Verbena PV Solar Energy Facility supports the notion of sustainable development by presenting a reasonable and feasible alternative to the existing vacant land use type, which has limited agricultural potential due the lack of water and infrastructure.

Furthermore the proposed alternative energy project (reliant on a natural renewable resource – solar energy) is in line with the national and global goal of reducing reliance on fossil fuels, thereby providing long-term benefits to future generations in a sustainable manner.

### **3.9.5 National Freshwater Ecosystem Priority Area Status**

The National Freshwater Ecosystem Priority Areas (NFEPA) database forms part of a comprehensive approach to the sustainable and equitable development of South Africa’s scarce water resources. This database guides how many rivers, wetlands and estuaries, and which ones, should remain in a natural or near-natural condition to support the water resource protection goals of the National Water Act (Act 36 of 1998). This directly applies to the National Water Act, which feeds into Catchment Management Strategies, water resource classification, reserve determination, and the setting and monitoring of resource quality objectives (Nel *et al.*, 2011). The NFEPA’s are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act’s biodiversity goals (NEM:BA) (Act 10 of 2004), informing both the listing of threatened freshwater ecosystems and the process of bioregional planning provided for by this Act (Nel *et al.*, 2011). No FEPA rivers nor wetlands are within proximity to the project area, with no systems located in the project area.

## **4. SITE DESCRIPTION AND ATTRIBUTES**

The following sections provide a description of the Natural, Historical Social and Built Environmental context of Portions 2, 3 and 4 of the Farm Houthaalboomen 31, with particular focus on the site location for the proposed Verbena PV. This section of the Draft Scoping Report has been prepared with input from the Avifaunal, Terrestrial Ecology, Aquatic Ecology, Agriculture, Heritage, Visual and social specialists. Please refer to the various specialist scoping reports in Annexure E1 – E6 for further information and context.

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<sup>13</sup> See definition of “sustainable development” in section 1 of NEMA.

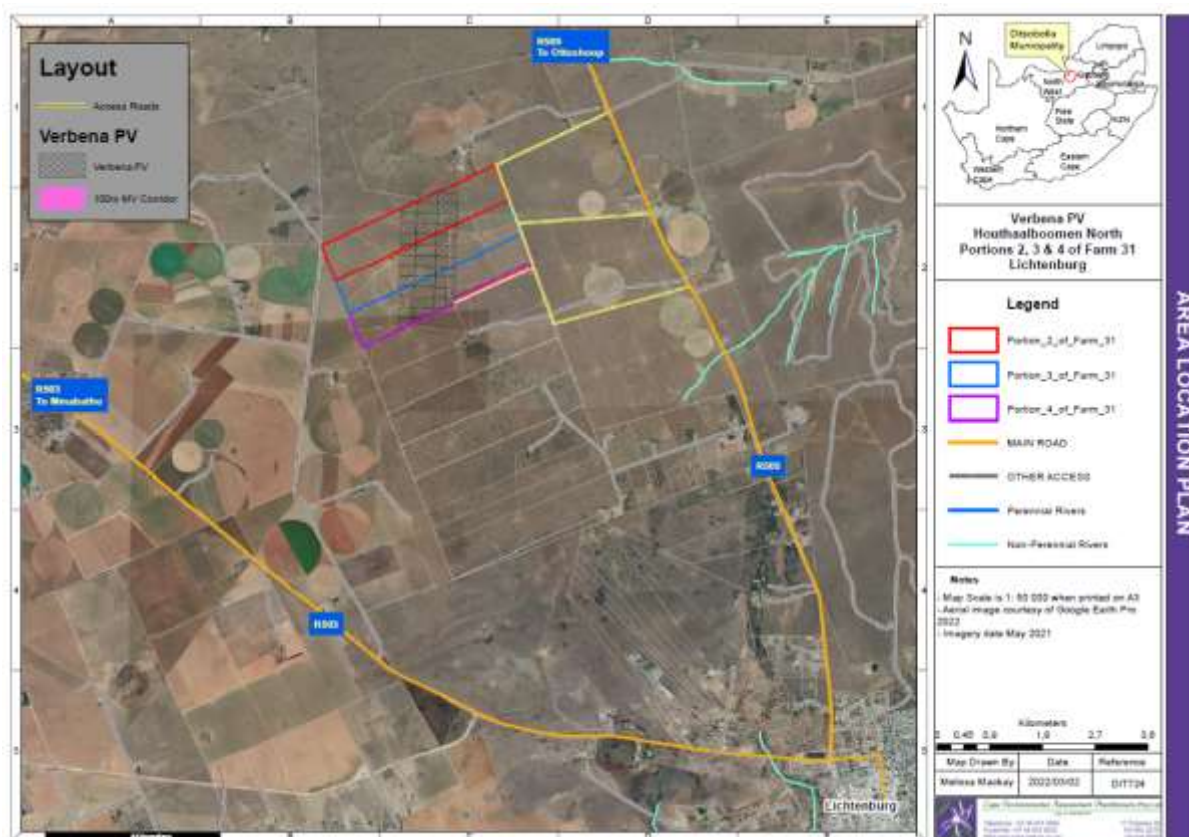


### 4.1 LOCATION & BUILT ENVIRONMENT

The target properties (Portions 2,3 and 4 of the Farm Houthaalboomen 31), is located in the Ngaka Modiri Molema District Municipality of the North West Province, within the jurisdiction area of the Ditsobotla Local Municipality. The combined property size is approximately 602.4942ha made up as follows:

- Portion 2 of Farm No 31, 206.4689ha
- Portion 3 of Farm No 31, 200.8904ha
- Portion 4 of Farm No 31, 195,1349ha

The proposed Verbena PV is accessed and is situated directly west of the R505 between Lichtenburg and Ottoshoop. Please refer to the location and topographical plans attached in Appendix A of this DSR.



**Figure 18:** Location of Verbena PV<sup>14</sup>

According to the heritage specialist report (See Annexure E4) one location with the remains of presumably farm labour dwellings was noted within the study site and consists of the ephemeral stone packed foundations of a rectangular structure.

<sup>14</sup> The access roads reflected in the above plan show all alternatives under investigation as described in section 2.5.2 of this report.



**Figure 19:** Ephemeral remains of a structure (van der Walt, 2022)

**4.2 GEOLOGY**

According to Bamford, 2022 (Annexure E4) The geology on site falls within the Monte Christo Formation, Malmani Subgroup, Chuniespoort Group, Transvaal Supergroup.

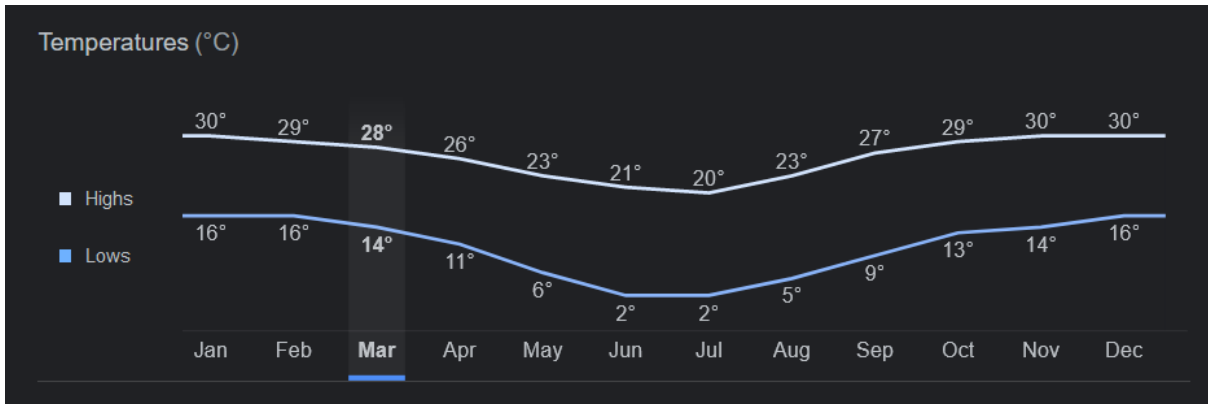


**Figure 20:** Geological map of the area around Verbena PV and Lichtenburg (Bamford, 2022)

The location of the proposed project is indicated within the yellow rectangle.

### 4.3 CLIMATE

The Lichtenburg area is characterised as having a moderate to cold semi-arid climate with maximum temperatures occurring in December and January and minimum temperatures occurring in June and July.



**Figure 21:** Average monthly temperatures in the Lichtenburg area.

The area receives a mean annual average rainfall of approximately 601mm. Precipitation is highest in January and lowest in June and August.

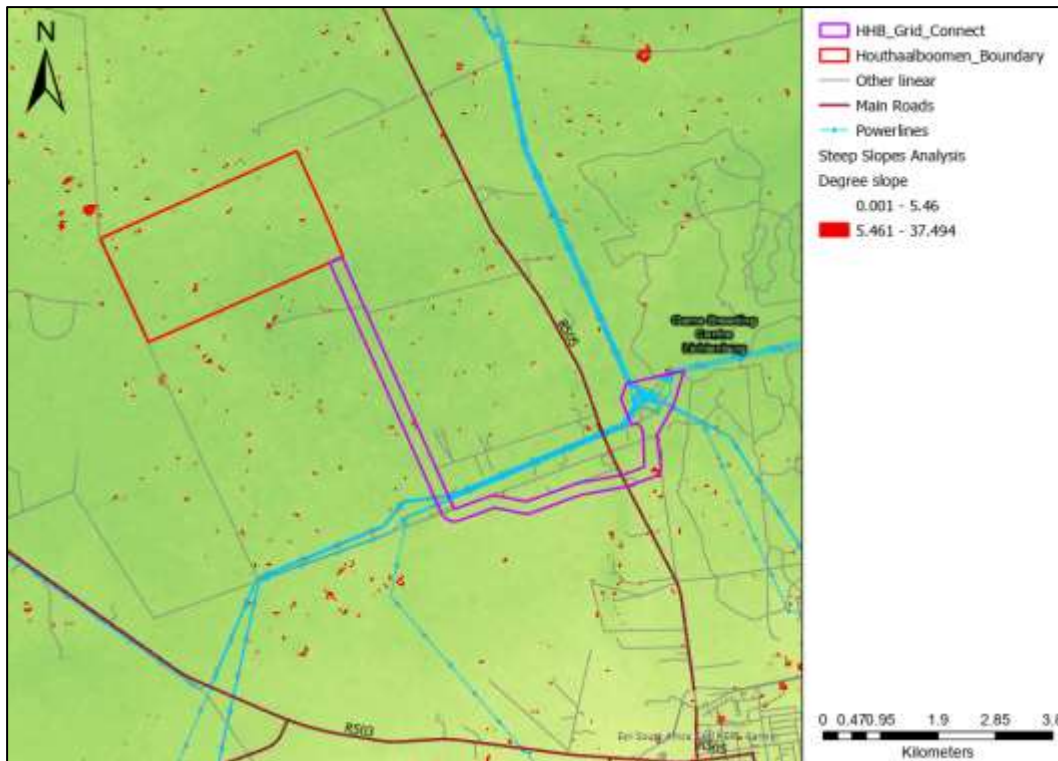


**Figure 22:** Average Monthly Rainfall in the Lichtenburg area.

### 4.4 TOPOGRAPHY

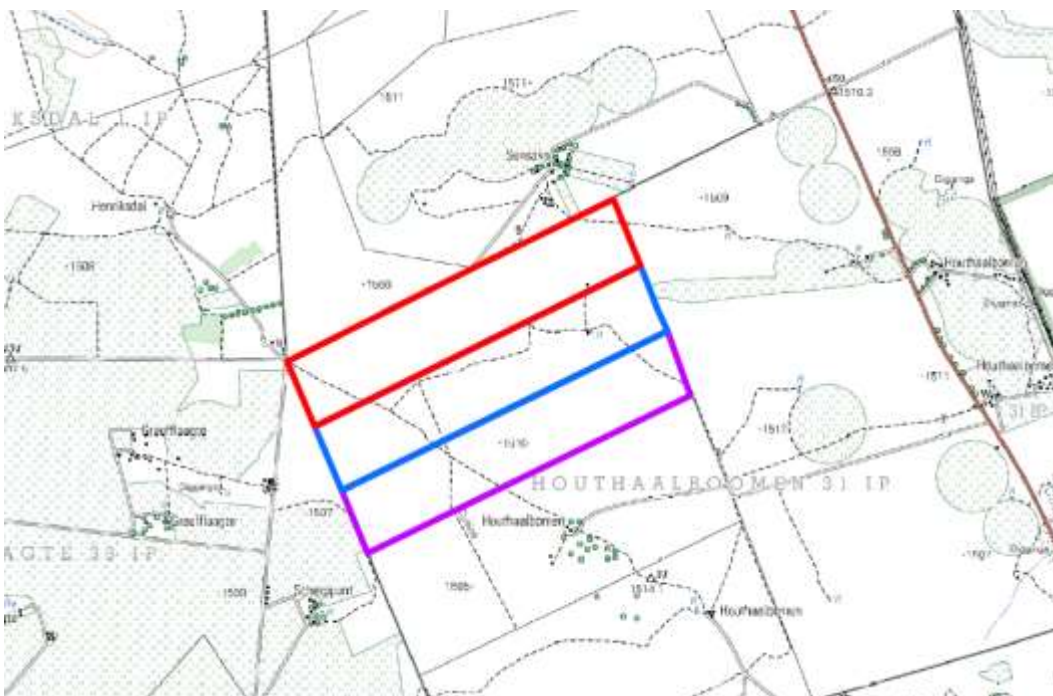
According to the Visual Specialist (see annexure E5) the site generally has a slope of between 0.01 and 5.46 degrees.





**Figure 23.** Slope analysis of the Study site and Proposed Grid Connection<sup>15</sup> (Stead, 2022)

This generally very flat topography is furthermore confirmed on the 1:50 000 Topographical Map (Please see Appendix A)



**Figure 24:** Extract of 1:50 000 Topographical Map of the study site.

<sup>15</sup> The Grid Connection is shown here for context, and it must be noted that this forms part of a separate environmental assessment process.

### 4.5 BOTANICAL COMPOSITION OF THE STUDY SITE

The Biodiversity Company (various authors, 2022) undertook an Aquatic and Terrestrial Ecology scoping level study for the proposed Verbena PV which included a baseline assessment of the Botanical Composition of the study site (Annexure E1). The following has been summarised from this report.

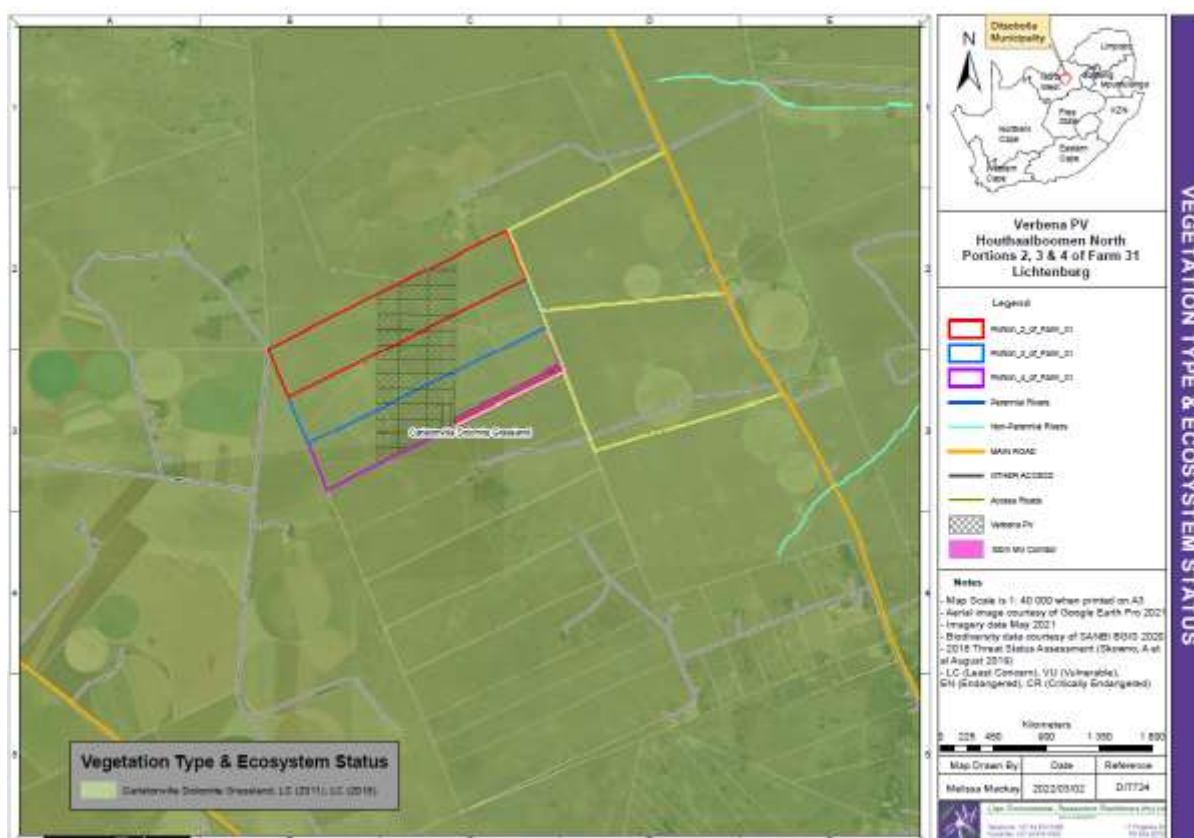
#### 4.5.1 Broad Vegetation Type

The project area is situated within the grassland biome. This biome is centrally located in southern Africa and adjoins all except the desert, fynbos and succulent Karoo biomes

The grassland biome is found chiefly on the high central plateau of South Africa, and the inland areas of KwaZulu-Natal and the Eastern Cape. The topography is mainly flat and rolling but includes the escarpment itself. Altitude varies from near sea level to 2 850 m above sea level.

Grasslands are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. The grassland biome experiences summer rainfall and dry winters with frost (and fire), which are unfavourable for tree growth. Thus, trees are typically absent, except in a few localized habitats. Geophytes (bulbs) are often abundant. Frosts, fire and grazing maintain the grass dominance and prevent the establishment of trees.

On a fine-scale vegetation type, the project area overlaps with the Carletonville Dolomite Grassland vegetation type.



**Figure 25:** Map illustrating the vegetation type associated with Verbena PV.

Carltonville dolomite grassland occurs on slightly undulating plains dissected by prominent rocky chert ridges. Species-rich grasslands forming a complex mosaic pattern dominated by many species. This vegetation type occurs in the North-West, Gauteng and marginally into the Free State Province: In the

region of Potchefstroom, Ventersdorp and Carletonville, extending westwards to the vicinity of Ottoshoop, but also occurring as far east as Centurion and Bapsfontein in Gauteng Province.

Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type.

According to Mucina and Rutherford (2006), this vegetation type is classified as VU, according to the NBA (2018) this vegetation type is classified as LC. The national target for conservation protection for this vegetation type is 24%, but only a small extent is conserved in statutory (Sterkfontein Caves — part of the Cradle of Humankind World Heritage Site, Oog Van Malmanie, Abe Bailey, Boskop Dam, Schoonspruit, Krugersdorp, Olifantsvlei, Groenkloof) and in at least six private conservation areas. Almost a quarter already transformed for cultivation, by urban sprawl or by mining activity as well as the building of the Boskop and Klerkskraal Dams.

#### 4.5.2 Expected Flora Species

The Southern African plant names and floristic details database indicates that 283 species of indigenous plants are expected to occur within the study site. One nationally protected tree namely *Vachellia erioloba* is expected to occur on the study site.

### 4.6 TERRESTRIAL FAUNAL COMPONENT OF THE STUDY SITE

The Biodiversity Company (various authors, 2022) undertook an Aquatic and Terrestrial Ecology scoping level study for the proposed Verbena PV which included a baseline assessment of the Terrestrial Faunal Composition of the study site (Annexure E1). The following has been summarised from this report.

#### 4.6.1 Amphibians

Based on the IUCN Red List Spatial Data and AmphibianMap, 19 amphibian species are expected to occur within the area. One threatened species, namely the Giant Bullfrog (*Pyxicephalus adspersus*) could occur on the study site.

The Giant Bull Frog (*Pyxicephalus adspersus*) is a species of conservation concern that could likely occur in the project area, as wetlands are present in the nearby areas. The Giant Bull Frog is listed as NT on a regional scale. It is a species of drier savannas where it is fossorial for most of the year, remaining buried in cocoons. They emerge at the start of the rains, and breed in shallow, temporary waters in pools, pans and ditches.

#### 4.6.2 Reptiles

Based on the IUCN Red List Spatial Data and the ReptileMAP database, 42 reptile species are expected to occur within the area. None of the species that may potentially occur on the site are regarded as threatened.

#### 4.6.3 Mammals

The IUCN Red List Spatial Data lists 68 mammal species that could be expected to occur within the area. Ten of these expected species are regarded as threatened, eight of these have a low likelihood of occurrence based on the lack of suitable habitat and food sources in the project area.

**Table 7:** Threatened mammal species that may occur within the study site (The Biodiversity Company, 2022)

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
<i>Aonyx capensis</i>	Cape Clawless Otter	NT	NT	Low

<i>Atelerix frontalis</i>	South Africa Hedgehog	NT	LC	Moderate
<i>Crocidura mariquensis</i>	Swamp Musk Shrew	NT	LC	Low
<i>Felis nigripes</i>	Black-footed Cat	VU	VU	Moderate
<i>Hydrictis maculicollis</i>	Spotted-necked Otter	VU	NT	Low
<i>Mystromys albicaudatus</i>	White-tailed Rat	VU	EN	Low
<i>Panthera pardus</i>	Leopard	VU	VU	Low
<i>Parahyaena brunnea</i>	Brown Hyaena	NT	NT	Low
<i>Poecilogale albinucha</i>	African Striped Weasel	NT	LC	Low
<i>Smutsia temminckii</i>	Temminck's Ground Pangolin	VU	VU	Low

### 4.7 AQUATIC COMPOSITION OF THE STUDY SITE

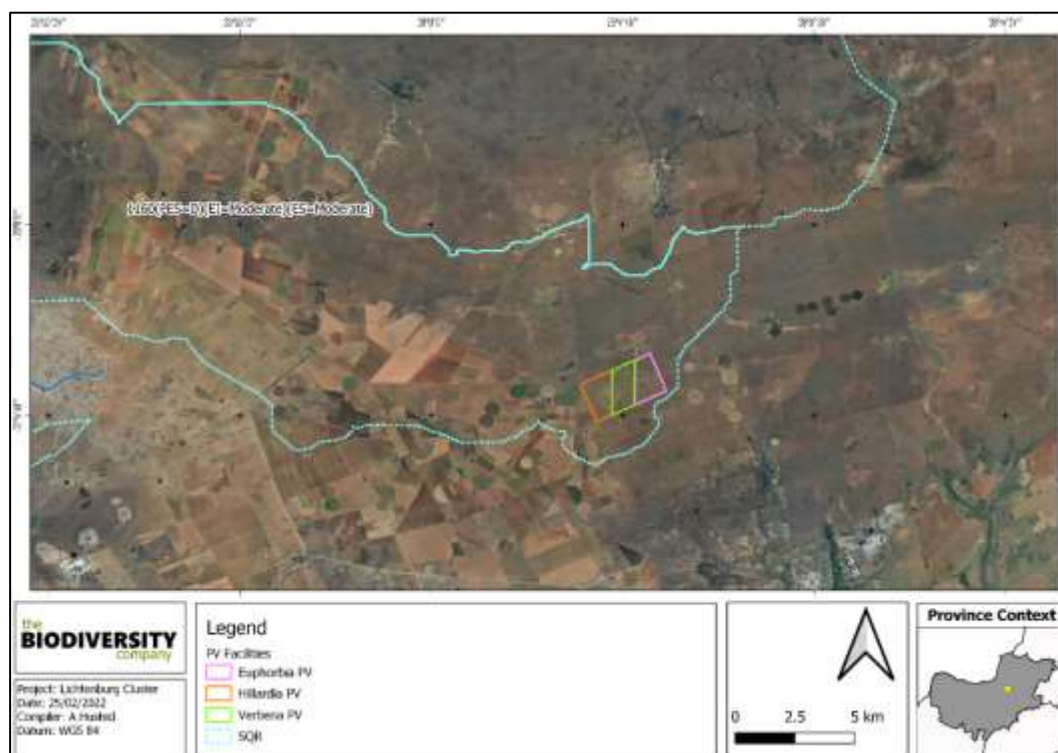
The Biodiversity Company (various authors, 2022) undertook an Aquatic and Terrestrial Ecology scoping level study for the proposed Verbena PV which included a baseline assessment of the Aquatic Composition of the study site (Annexure E1). The following has been summarised from this report.

#### 4.7.1 Hydrological Setting

The study site is mainly within the Vaal Water Management Area while a small portion (on Verbena PV) is located within the Crocodile (west) and Marico Water Management Area.

#### 4.7.2 Present Ecological Status

The study site overlaps the C31A and D41A quaternary catchments within the Sub-Quaternary Reach D41A-01160. The nearest watercourse is more than 20 km from the project area.



**Figure 26:** Location of the study site in relation to the Sub-Quaternary Reach (The Biodiversity Company, 2022)



The Present Ecological State category of the reach is classed as largely modified (class D). The moderately modified state of the reach was attributed to serious potential flow modifications activities, potential instream habitat modification activities, impacts to wetland and riparian zone, impacts to the instream habitat continuity, physico-chemical conditions (water quality) and large riparian and wetland zone continuity.

**Table 8:** Summary of the Present Ecological State of the D41A-01160 Sub-Quaternary Reach

Component/Catchment	D41A-01160
Present Ecological Status	Largely Modified (class D)
Ecological Importance Class	Moderate
Ecological Sensitivity	Moderate
Default Ecological Category	Moderately Modified (class C)

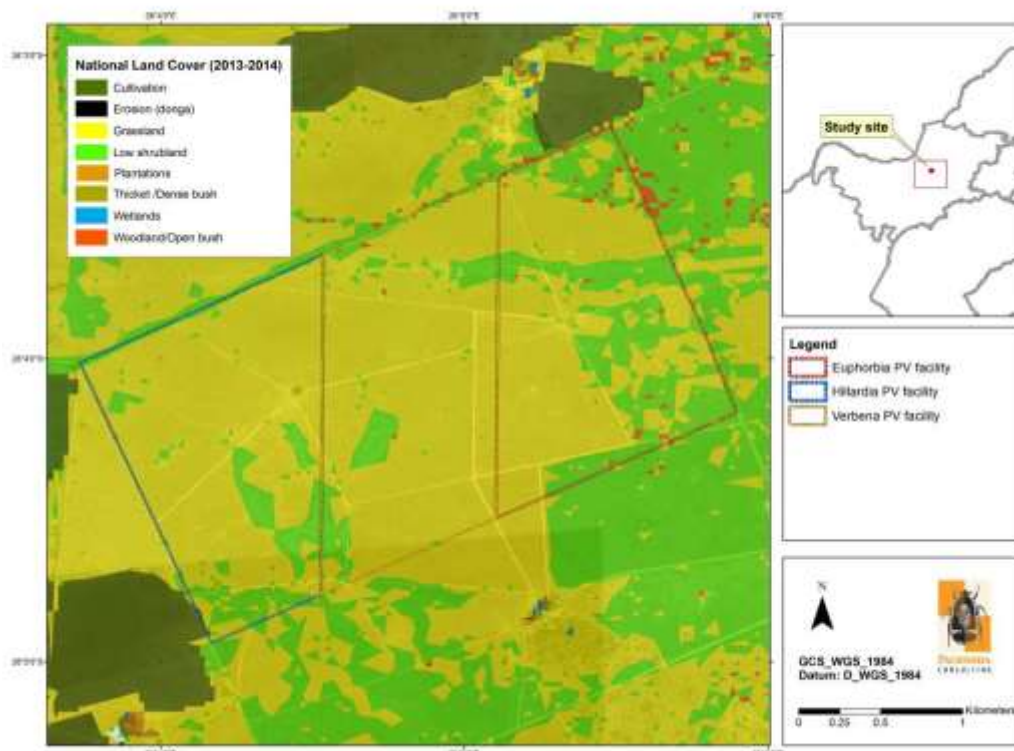
**4.8 AVIFAUNAL COMPOSITION OF THE STUDY SITE**

Pachnoda Consulting (Lucas Niemand, 2022) undertook an Avifaunal scoping level study for the proposed Verbena PV (Annexure E2). The following has been summarised from this report.

**4.8.1 Land cover, land use and existing infrastructure.**

According to the South African National dataset of 2013-2014 the study site comprehends the following land cover categories.

- Grassland;
- Low shrubland; and
- Woodland and open bush.



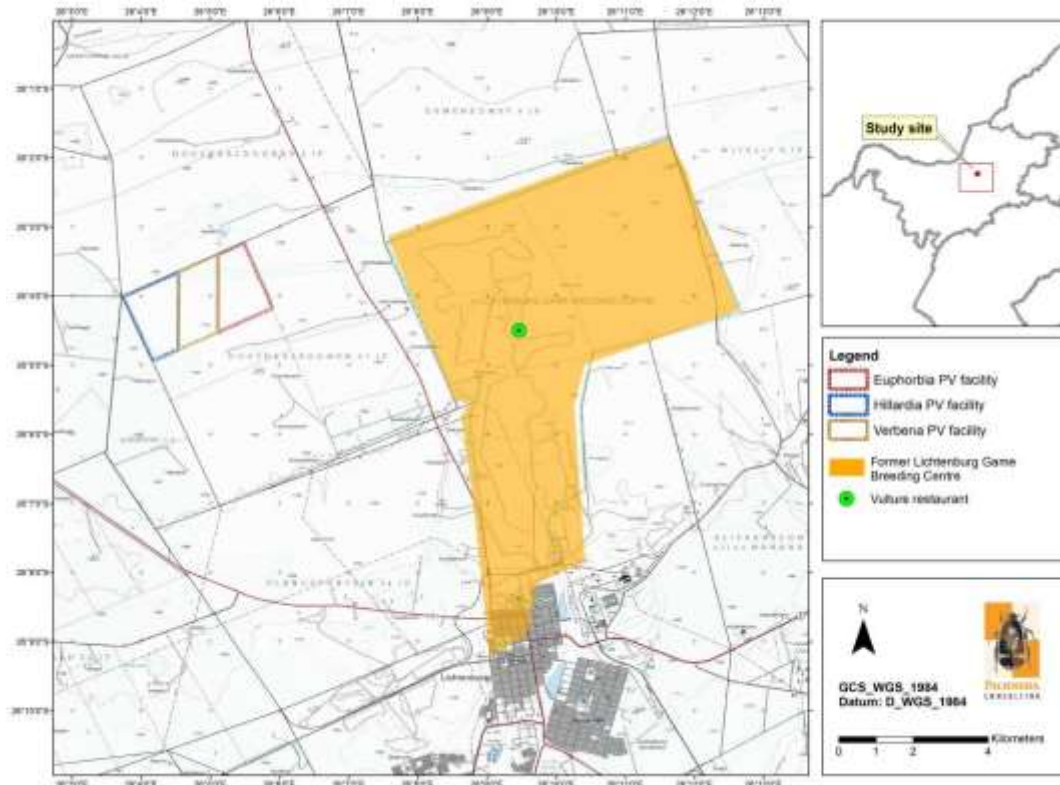
**Figure 27:** Land cover classes of the study site (Pachnoda,2022).



### 4.8.2 Conservation Areas, Protected Areas and Important Bird Areas

The study site is located approximately 3.2 km west of the former Lichtenburg Game Breeding Centre. This conservation area contains a variety of game species, and the facility operates a vulture restaurant which attracts foraging vultures to the region.

There are no other formal protected areas or any Important Bird and Biodiversity Areas in close proximity to the study site.

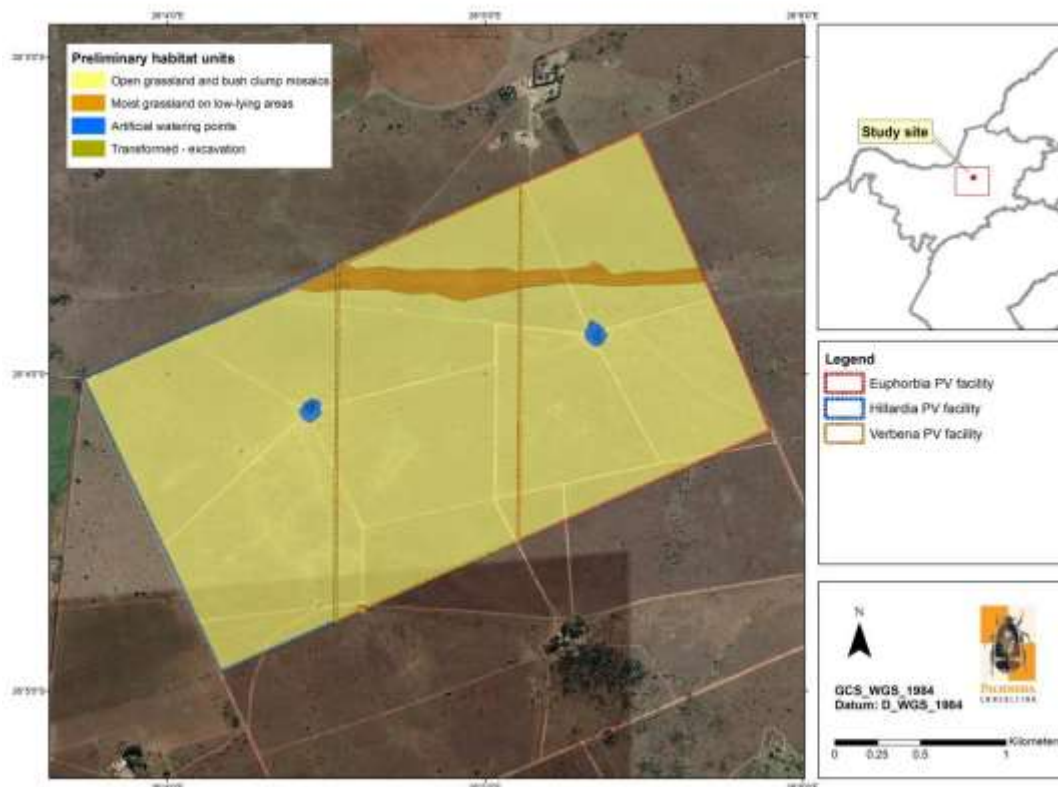


**Figure 28:** A map illustrating the locality of conservation areas in close proximity to the proposed study site (Pachnoda, 2022)

### 4.8.3 Important avifaunal habitat types

Apart from the regional vegetation type, the local composition and distribution of the vegetation associations on the study site are a consequence of a combination of factors simulated by soil type, geology and grazing intensity (presence of livestock) which have culminated in a number of habitat types,

- Open mixed dolomite grassland with bush clump mosaics:
- Moist grassland located within low-lying areas:
- Artificial livestock watering points.
- Transformed areas



**Figure 29:** A preliminary habitat map illustrating the avifaunal habitat types on the study site (Pachnoda, 2022).

#### 4.8.4 Avifaunal Species Richness

Approximately ~181 bird species are expected to occur on the study site and immediate surroundings. This equates to 18 % of the approximate 986 species listed for the southern African subregion and approximately 21 % of the 858 species recorded within South Africa.

The study site is expected to be poorly represented by biome-restricted and local endemic bird species. It is expected to support 34 % of the near-endemic species present in the subregion. Of the 181 bird species expected to occur in the project area, 11 are threatened or near threatened species, 15 are southern African endemics and 21 are near-endemic species.

**Table 9:** Total number of species, Red listed species, endemics and biome-restricted species expected to occur in the study site (Pachnoda, 2022)

Description	Expected Richness Value
Total number of species*	181 (21 %)
Number of Red Listed species*	11 (8 %)
Number of biome-restricted species – Zambezi and Kalahari-Highveld Biomes	4 (29 %)
Number of local endemics	2 (5 %)
Number of local near-endemics	7 (23 %)
Number of regional endemics	15 (14 %)
Number of regional near-endemics	21 (34 %)

**Table 10:** Expected biome-restricted species likely to occur on the study site (Pachnoda, 2022)

Species	Kalahari-Highveld	Zambezi	Expected Frequency of occurrence
Kalahari Scrub-robin ( <i>Cercotrichas paena</i> )	X		Common
Kurichani Thrush ( <i>Turdus libonyana</i> )		X	Uncommon
White-throated Robin-chat ( <i>Cossypha humeralis</i> )		X	Rare
White-bellied Sunbird ( <i>Cinnyris talatala</i> )		X	Uncommon

#### 4.8.5 Bird species of conservation concern

The table below provides an overview of bird species of conservation concern that could occur on the study site based on their historical distribution ranges and the presence of suitable habitat. A total of 11 species could occur on the study site which includes six globally threatened species, one globally near threatened species, two regionally threatened species and two regionally near-threatened species.

**Table 11:** Bird species of conservation concern that could utilise the study site based on their historical distribution range and the presence of suitable habitat (Pachnoda, 2022)

Species	Global Conservation Status*	National Conservation Status**	Preferred Habitat	Potential Likelihood of Occurrence
<i>Anthropoides paradiseus</i> (Blue Crane)	Vulnerable	Near threatened	Prefers open grasslands. Also forages in wetlands, pastures and agricultural land.	Potential vagrant or highly irregular foraging visitor.
<i>Aquila rapax</i> (Tawny Eagle)	Endangered	Endangered	Lowveld and Kalahari savannas, especially game farming areas and reserves	An irregular visitor or vagrant to the study site.
<i>Ciconia abdimii</i> (Abdim's Stork)	-	Near threatened	Open stunted grassland, fallow land and agricultural fields.	An uncommon summer foraging visitor to areas consisting of secondary grassland or arable land.
<i>Falco vespertinus</i> (Red-footed Falcon)	Near threatened	Near threatened	Varied, prefers to hunt open arid grassland and savannoid woodland, often in company with Amur Falcons ( <i>F. amurensis</i> ).	An occasional summer foraging visitor to the area.
<i>Falco biarmicus</i> (Lanner Falcon)	-	Vulnerable	Varied, but prefers to breed in mountainous areas.	An occasional foraging visitor to the study area.
<i>Gyps coprotheres</i> (Cape Vulture)	Endangered	Endangered	Mainly confined to mountain ranges, especially near breeding site. Ventures far afield in search of food.	A regular foraging/scavenging visitor to the study site pending the presence of food (e.g. livestock carcasses).
<i>Gyps africanus</i>	Critically Endangered	Critically Endangered	Breed on tall, flat-topped trees. Mainly	A regular foraging/scavenging visitor to

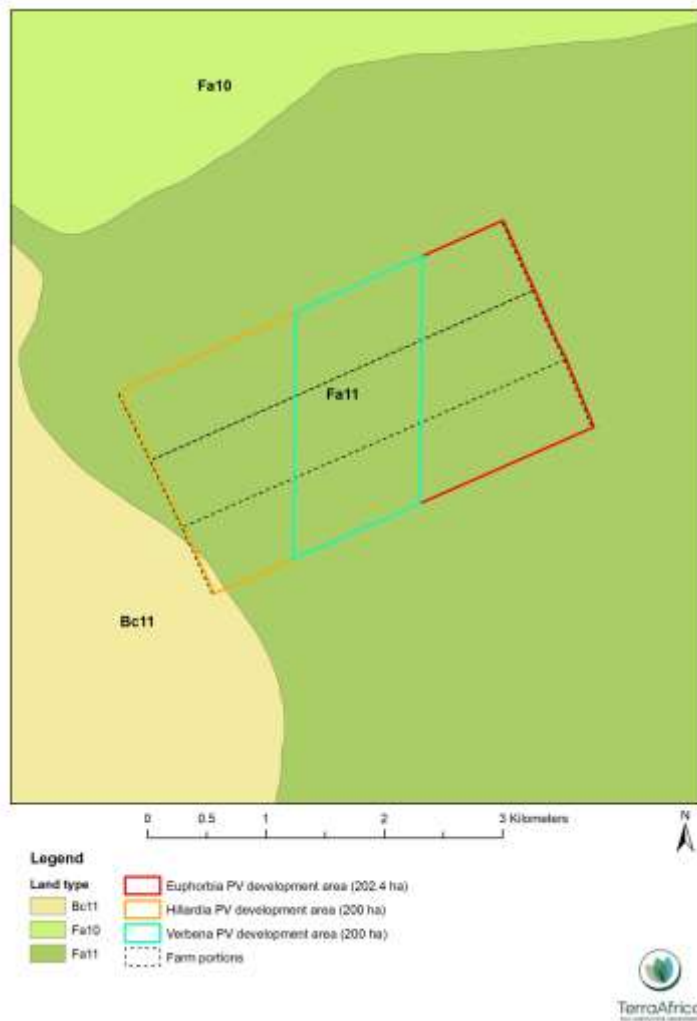
Species	Global Conservation Status*	National Conservation Status**	Preferred Habitat	Potential Likelihood of Occurrence
(White-backed Vulture)			restricted to large rural or game farming areas.	the study site pending the presence of food (e.g. livestock carcasses).
<i>Leptoptilos crumeniferus</i> (Marabou Stork)	-	Near threatened	Varied, from savanna to wetlands, pans and floodplains – dependant of game farming areas	An irregular scavenging visitor to the area.
<i>Polemaetus bellicosus</i> (Martial Eagle)	Endangered	Endangered	Varied, from open karroid shrub to lowland savanna.	An irregular foraging visitor. It was last recorded from pentad 2605_2605 south-east of the study site on 28 Jan 2012.
<i>Sagittarius serpentarius</i> (Secretarybird)	Endangered	Vulnerable	Prefers open grassland or lightly wooded habitat.	Regarded as an irregular foraging visitor to the study site despite the widespread presence of suitable foraging habitat.
<i>Torgos tracheliotos</i> (Lapped-faced Vulture)	Endangered	Endangered	Lowveld and Kalahari savanna; mainly on game farms and reserves	A regular foraging/scavenging visitor to the study site pending the presence of food (e.g. livestock carcasses).

#### 4.9 AGRICULTURAL RESOURCES WITHIN THE STUDY SITE

TerraAfrica (Mariné Pienaar, 2022) undertook an Agriculture scoping level study for the proposed Verbena PV (Annexure E3). The following has been summarised from this report.

##### 4.9.1 Land type classification

The entire extent of Verbena PV, consists of Land Type Fa 11.



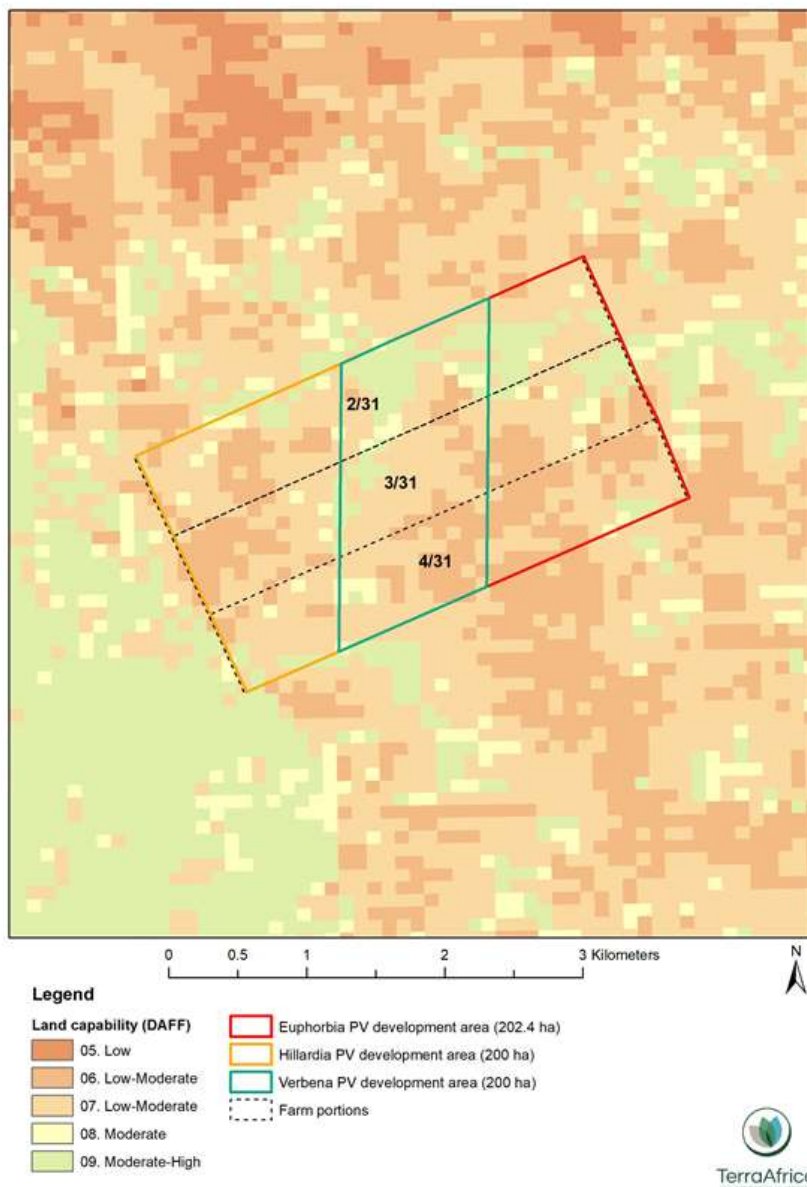
**Table 12:** Land type map showing the proposed Verbena PV (turquoise polygon) as well as the other two PV facilities proposed within the study area. (TerraAfrica, 2022)

**4.9.1.1 Land Type Fa11**

The crests and mid-slopes are dominated by soil of the Glenrosa and Mispah forms. The rest of this land type consists of yellow-brown and red apedal soil either underlain by unspecified material or by plinthic material along the toe-slopes and valley bottoms. According to the land type charts, 40 to 50% of foot slope and valley bottom positions consist of these deeper soil forms. The valley bottoms might potentially consist of a hydromorphic soil form that may have wetland potential. The slope of the terrain is very flat with Terrain unit 3 having the steepest slope (between 2% and 5%). The clay content of the topsoil horizons are estimated to range between 10% and 25% while subsoil clay content is estimated to range between 13% and 40%.

**4.9.2 Land capability**

The land capability classification of the study site was obtained from the DALRR raster data (DALRRD, 2016),



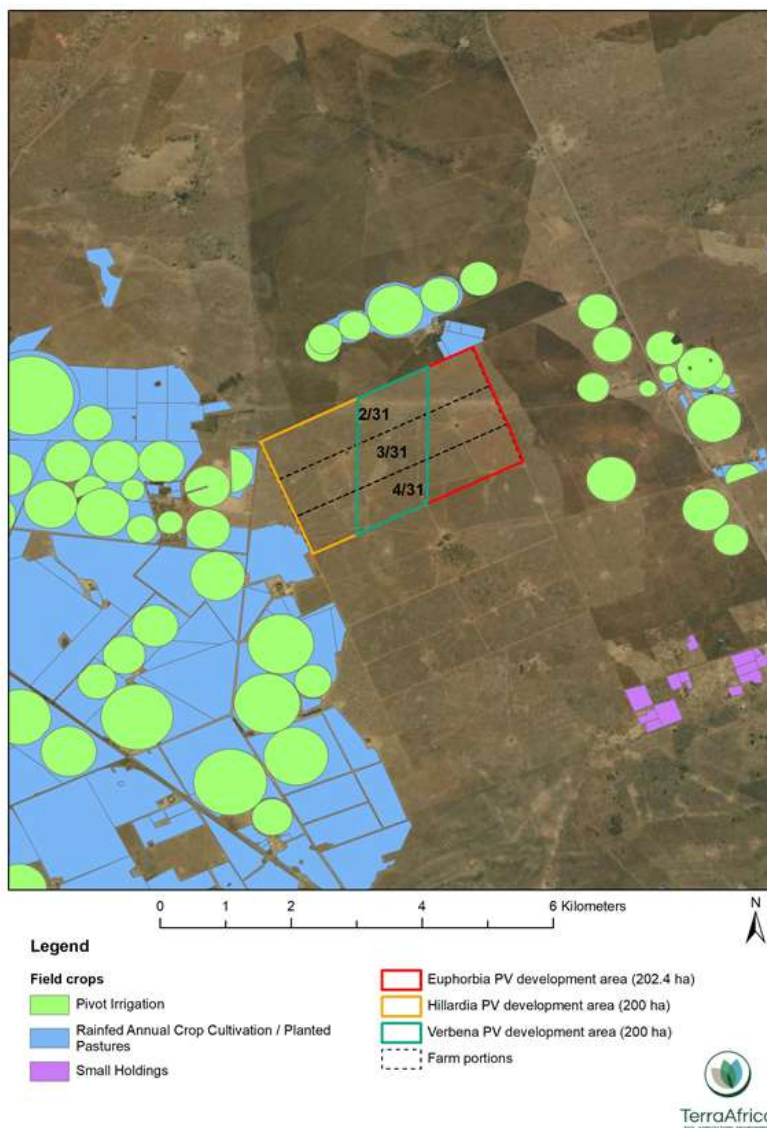
**Figure 30:** Land capability map of the proposed Houthaalboomen North Cluster PV facilities. The Verbena PV facility is depicted by the green Polygon (TerraAfrica, 2022))

The largest part of the Verbena PV development area consists of land with Class 06 and Class 07 (Low-Moderate) land capability. Pockets within the north of the site consists of small areas with higher land capability that is considered Moderate-High (Class 09). A few very small areas of Moderate (Class 08) land capability are scattered through the middle of the development area.

### 4.9.3 Agricultural production

The current agricultural production within the study site was determined by using a combination of the field crop boundary data and the long-term grazing capacity of the area. The grazing capacity of all three the development areas is homogeneous and indicated as 8 ha/LSU which is considered to be moderate grazing potential. Following the crop field boundaries, there are no crop fields within any of the three development areas.





**Figure 31:** Field crop boundaries of the Study Site (Verbena PV is Depicted by the green polygon) (TerraAfrica, 2022)

The current land use of the Verbena PV development area is extensive livestock farming. The grazing capacity of the development area is 8ha/LSU. The Verbena development area of 220 ha therefore has the capacity to feed 25 head of cattle. Land with grazing capacity of 8ha/LSU is considered to have moderate grazing potential. It is lower than the wetter, eastern parts of the country such as Mpumalanga where the grazing capacity ranges from 4 to 6 ha/LSU. However, it is higher than drier areas in the western parts of South Africa, such as the Kalahari. Grazing capacity in the Kalahari ranges between 11 and 17 ha/LSU. The grazing capacity of the Karoo is much lower than that, with some areas having grazing capacity as low as 70ha/LSU.

There are no crop field boundaries within the Verbena PV development area. Crop fields with rainfed annual crops and planted pastures as well as centre pivot irrigation, are present directly west of the Verbena site. More pivot irrigation is present about 1.5 km north and 4km east of the development area. A few small-holdings are located about 6 km south-east of the area.

#### 4.9.4 High Potential Agricultural Areas

To determine whether the proposed development of the three PV facilities within the Houthaalboomen North Cluster will affect any High Potential Agricultural Areas (HPAAs) delineated within the North West

Province, the development areas were depicted in relation to these areas (see Figure 9). None of the three proposed facilities are part of any HPAA. The three areas border on a Category B Irrigation PAA along the western, northern and eastern boundaries of the entire Houthaalboomen North Cluster development area. Category A areas have the highest priority for conservation, followed by Category B areas and then Category C areas. Differentiation is also made between areas with irrigated and rainfed agriculture. Although large areas are delineated as HPAA's, not all within the area may be used for irrigated agriculture.

#### **4.10 HERITAGE RESOURCES OF THE STUDY SITE**

Beyond Heritage (Van der Walt, 2022) undertook a Heritage Scoping Scoping level study for the proposed Verbena PV (Annexure E4). This Heritage study includes input from a Palaeontology Specialist (Bamford, 2022). The following has been summarised from this report.

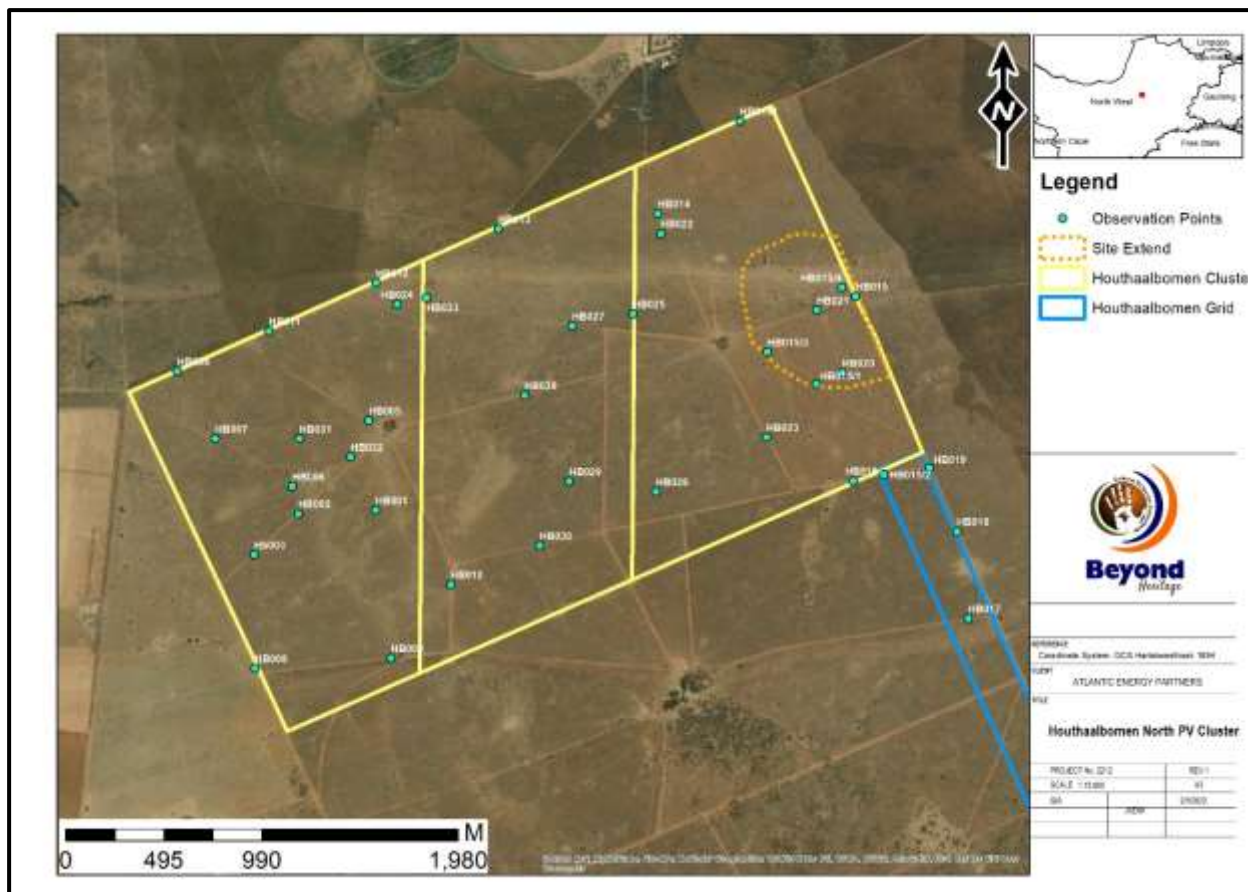
Heritage resources were limited to background scatters of MSA lithic material that was found throughout the entire project area. The occurrences were primarily visible in areas where the topsoil has been cleared for small gravel roads that divide the project area into smaller grazing camps. The general artefact density increases towards the eastern boundary of the project area and seems to coincide heavily with the underlying geological formations across the landscape. Recorded heritage features were labelled numerically and are briefly discussed below.

##### **4.10.1 Heritage Resources**

At the start of the survey Stone Age material was noticed scattered in varying densities throughout the study area. Therefore low-density scatters (between 3 - 5 artefacts per m<sup>2</sup>) was recorded as occurrences of low significance. A Scatter with a density higher than 5 artefacts per m<sup>2</sup> were demarcated and is of medium significance and warrants mitigation that could include surface sampling and test excavations prior to construction. Scatters with densities less than 2 artefacts per m<sup>2</sup> were not recorded as they occur throughout the area. Individual occurrences were not point plotted within the recorded scatters however an attempt was made at determining site extent. GPS readings were taken roughly in the middle of each identified scatter. Based on the DFFE screening tool, the heritage sensitivity of the study area is mostly low, with a small area indicated as high. However, no additional data is available on the type of resource. Mapping of the sensitive area based on the coordinates in the screening tool plots out in a different location to that indicated on the screening tool map. It is assumed that this area relates to the Stone Age occupation of the study area that was adequately recorded during the field survey.

The Stone Age artefacts date to the MSA and LSA and are made from fine grained material like chert and cryptocrystalline silica (CCS) and is exposed on rocky outcrops and cleared areas. No formal tools that can be attributed to an industry level were noted and artefacts consist of flakes without retouch, MSA blades and radial cores. One location with the remains of presumably farm labour dwellings were noted and consist of the ephemeral stone packed foundations of a rectangular structure.





**Figure 32:** Recorded features in relation to the study Site. Verbena PV is depicted by the yellow polygon in the centre (Van der Walt, 2022)

**Table 13.** Recorded observations in the study area (Van der Walt, 2022)

LABEL	LONGITUDE	LATITUDE	TYPE SITE	SIGNIFICANCE/ FIELD RATING
HB001	26° 04' 24.3623" E	26° 04' 20.1756" S	Stone Age Scatter	Low – GP C
HB002	26° 04' 11.7121" E	26° 04' 20.7661" S		Low – GP C
HB003	26° 04' 04.4904" E	26° 04' 27.4477" S		Low – GP C
HB004	26° 03' 51.8869" E	26° 03' 57.4919" S		Low – GP C
HB005	26° 04' 23.2356" E	26° 04' 05.5272" S		Low – GP C
HB006	26° 04' 10.7327" E	26° 04' 16.2839" S	Rectangular stone wall foundation.	Low – GP C
HB007	26° 03' 58.1687" E	26° 04' 08.5151" S	Stone Age Scatter	Low – GP C
HB008	26° 04' 04.6416" E	26° 04' 46.0415" S		Low – GP C
HB009	26° 04' 26.9257" E	26° 04' 44.3640" S		Low – GP C
HB010	26° 04' 36.6743" E	26° 04' 32.3291" S		Low – GP C
HB011	26° 04' 06.8845" E	26° 03' 50.9005" S		Low – GP C

LABEL	LONGITUDE	LATITUDE	TYPE SITE	SIGNIFICANCE/ FIELD RATING
HB012	26° 04' 24.4019" E	26° 03' 43.0560" S		Low – GP C
HB013	26° 04' 44.4180" E	26° 03' 34.2181" S		Low – GP C
HB014	26° 05' 10.5181" E	26° 03' 31.7268" S		Low – GP C
HB141	26° 05' 23.9568" E	26° 03' 16.5923" S		Low – GP C
HB015	26° 05' 42.8604" E	26° 03' 45.2268" S		Medium – GP B
HB015/1	26° 05' 36.4057" E	26° 03' 59.5369" S		Medium – GP B
HB015/2	26° 05' 47.4467" E	26° 04' 14.3941" S		Medium – GP B
HB015/4	26° 05' 40.6211" E	26° 03' 43.7615" S		Medium – GP B
HB015/3	26° 05' 28.4389" E	26° 03' 54.3097" S		Medium – GP B
HB016	26° 05' 42.4500" E	26° 04' 15.3947" S		Low – GP C
HB017	26° 06' 01.3033" E	26° 04' 37.8912" S		Low – GP C
HB018	26° 05' 59.4529" E	26° 04' 23.6713" S		Low – GP C
HB019	26° 05' 54.9527" E	26° 04' 13.2815" S		Low – GP C
HB020	26° 05' 40.6715" E	26° 03' 57.7044" S		Low – GP C
HB021	26° 05' 36.5065" E	26° 03' 47.4875" S		Low – GP C
HB022	26° 05' 11.0003" E	26° 03' 34.9848" S	Isolated MSA core	Low – GP C
HB023	26° 05' 28.3056" E	26° 04' 08.2631" S	Stone Age Scatter	Low – GP C
HB024	26° 04' 27.8795" E	26° 03' 46.5587" S		Low – GP C
HB025	26° 05' 06.4608" E	26° 03' 48.0816" S		Low – GP C
HB026	26° 05' 10.1795" E	26° 04' 17.1732" S		Low – GP C
HB027	26° 04' 56.4853" E	26° 03' 50.0544" S		Low – GP C
HB028	26° 04' 48.7201" E	26° 04' 01.4089" S		Low – GP C
HB029	26° 04' 56.0136" E	26° 04' 15.4740" S		Low – GP C
HB030	26° 04' 51.2219" E	26° 04' 25.9969" S		Low – GP C
HB031	26° 04' 11.9243" E	26° 04' 08.5223" S		Low – GP C
HB032	26° 04' 20.2908" E	26° 04' 11.4925" S		Low – GP C
HB033	26° 04' 32.6927" E	26° 03' 45.4645" S		Low – GP C

### **4.10.2 Cultural Landscape**

The study area is located in a rural setting used for cultivation and grazing and remains largely undeveloped. The area is traversed by a road and tracks are visible from before the 1970's.

### **4.10.3 Paleontological Resources**

Based on the SAHRA sensitivity map the area is of high sensitivity, concurring with the DFFE Screening Tool as the Monte Christo and Oaktree Formations of the Malmani Subgroup are indicated as very highly sensitive (red) because of the potential of finding trace fossils, in particular stromatolites and this aspect was addressed by the palaeontology specialist (Bamford,2022) included as Appendix A of the Heritage Scoping Study in Annexure E4.

In terms of the palaeontological component, the proposed site lies on the potentially very highly fossiliferous rocks of the Malmani Subgroup, (Chuniespoort Group, Transvaal Supergroup), particularly the Oaktree Formation. The site visit for this project found that there were good exposures of dolomite but no stromatolites were present. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information the specialist has recommended that no further palaeontological impact assessment is required unless fossils are found by the developer/ environmental officer/ other designated responsible person once excavations/drilling activities have commenced.

## **4.11 VISUAL RESOURCES OF THE STUDY SITE**

Visual Resource Management Africa (Stead, 2022) undertook Scoping level study for the proposed Verbena PV (Annexure E5). The following has been summarised from this report.

### **4.11.1 Regional Locality**

Lichtenburg town is today the centre of a huge farming district where maize, groundnuts and sunflower seeds are the main crops. The biggest pure red diamond ("pigeon blood red") in the world was found here. From 1925 to 1935 diamonds were discovered, and over 7 million carats of diamonds have been found in the region. Lichtenburg Game Breeding Centre outside town provides a good network of roads facilitate the viewing of animals.

The study area is located within the visual influence of the town industry, namely the Lichtenburg LaFarge Cement Factory that is a large industrial structure that is dominating landscape feature in the regional landscape.

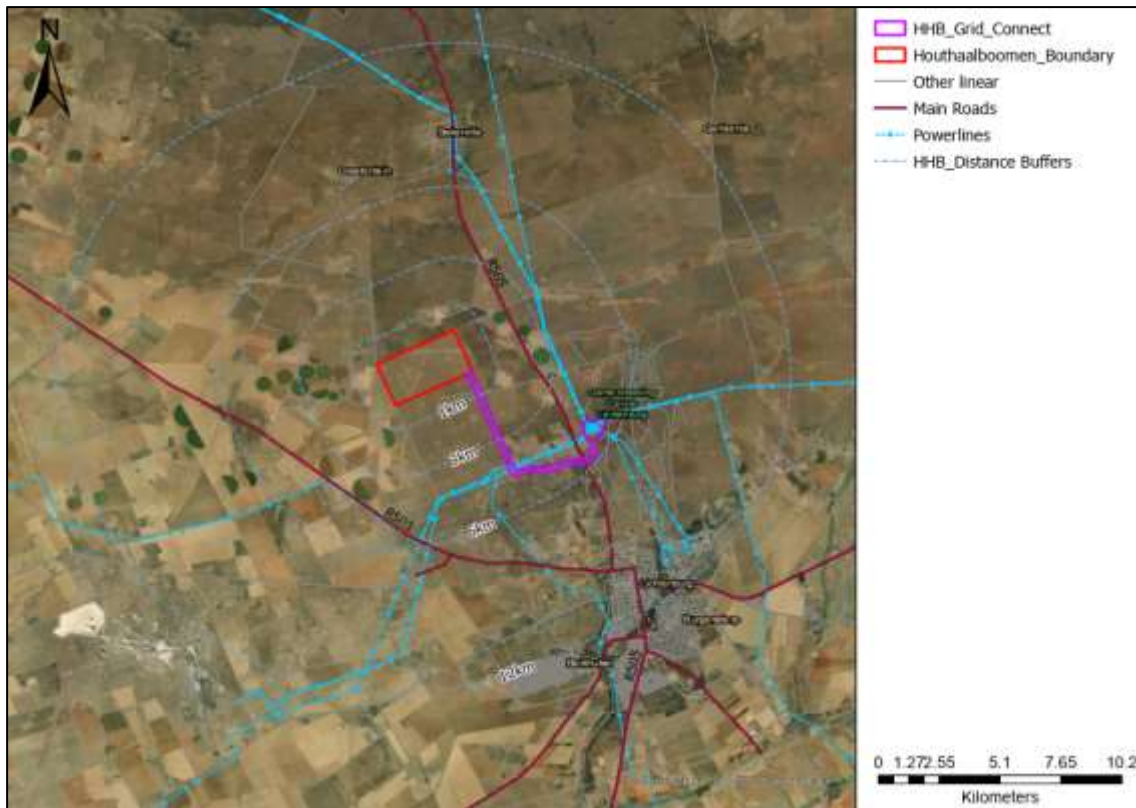


**Figure 33.** Photograph of the Lichtenburg LaFarge Cement Factory that forms a background view to much of the regional landscape (Stead, 2022)

#### **4.11.2 Land use and Main Infrastructure**

Land use is a crucial factor in determining landscape character, especially regarding the Visual Absorption Capacity (VAC) of the landscapes. Infrastructure is often a by-product of land use with the main road, rail and power lines a result of the historical development of the region. The current land use of the proposed properties is cattle and maize farming. Multiple centre pivots are visible in the landscape emphasising the intensive farming nature of the area. Within the regional landscape context are small-holding type properties to the northeast of the town of Lichtenburg (south of the study area). This increases the number of receptors but is also manifesting in a semi-industrial land use where many of these properties are being used for business activities.

As can be seen in the map below, the area is also strongly characterised by power line infrastructure routed to the Eskom Watershed Substation.



**Figure 34:** Land use map depicting Open-Street spatial data overlay onto ESRI satellite imagery (Stead, 2022)

#### 4.11.3 Conservation

According to the South Africa Conservation Areas dataset (3<sup>rd</sup> quarter 2021) The only conservation area in the region is the Marico Biosphere Reserve situated approximately 5.3km to the north of the study site. An informal conservation area, the Lichtenburg Game Breeding Area located to the east. As previously indicated, due to the flat terrain and thornveld vegetation, the project ZVI does not extend to the east. This area has also been proposed for a PV project and as such would be subject to a land use change.

#### 4.11.4 Vegetation

The vegetation type was identified as Carltonville Dolomite Grasslands located within a Grassland Biome and the Dry Highveld Grassland Bioregion. This is reflected in the site survey where grassland was the dominant vegetation type, but also applicable to the landscape character were the Thornveld type trees, that are small to medium in size, do also add to the local landscape character. This indicates that planting of similar trees can be effective in screening from receptors sensitive to landscape change should this be a requirement in the EIR phase.





**Figure 35.** Acacia type thorn trees adding to the local sense of place (Stead, 2022)

#### **4.11.5 Renewable Energy Projects**

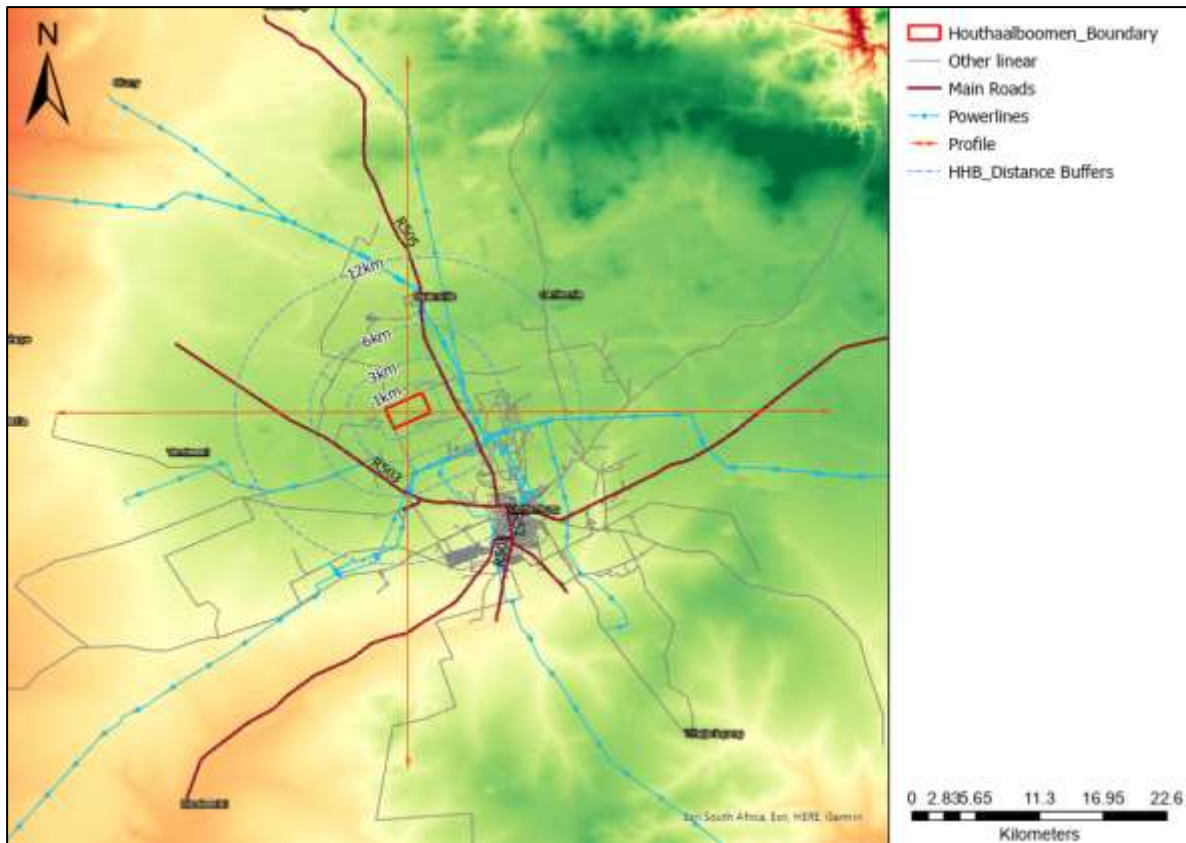
Although not located within a REDZ area, there are numerous proposed PV projects located within the expected project Zone of Visual Influence. The site does, however, fall within a strategic transmission corridor associated with the REDZ. The site visit found that none of the authorised projects were yet to be constructed. Of interest is that much of the proposed PV authorised was in the vicinity of the Lichtenberg Breeding Grounds. The close proximity of the other proposed PV projects to the proposed development area does raise an issue in terms of cumulative visual massing effect should all the PV projects be constructed. This issue is flagged as a low probability risk but would need to be addressed in the impact assessment phase to ensure that the existing rural agricultural landscape sense of place is retained as these agrarian features do add to the regional scenic quality and sense of place.

#### **4.11.6 Regional Topography**

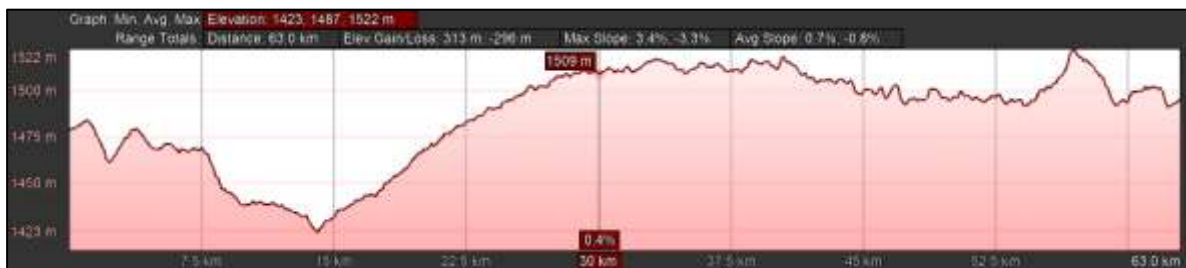
Regional and local topography has the potential to strongly influence landscape character, as well as the extent of the Zone of Visual Influence. In order to better understand these aspects of the study, a Digital Elevation Model was generated making use of the NASA STRM digital elevation model.

Due to the relatively flatter nature of the terrain, the zone of visual influence is likely to be contained to some degree as slight regional undulation and local vegetation screening is likely to reduce the regional ZVI.

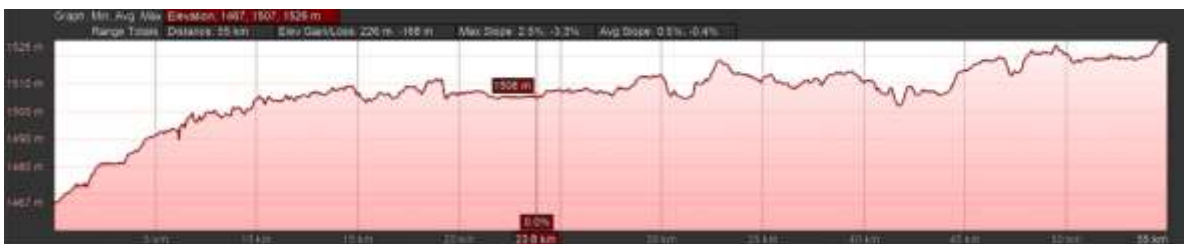
In terms of the South to North Profile, the elevation range is from 1400mamsl in the south at the location of the Grootharts River, to a high of 1522mamsl in the north. The 122m spread over a distance of 63km re-emphasises the flat nature of the terrain. The West to East Profile also reflects a similar elevation range, with no significant landforms and the regional terrain predominantly flat, with some lower lying areas associated with hydrological drainage lines of the Grootharts River to the south.



South to North Profile



West to East Profile



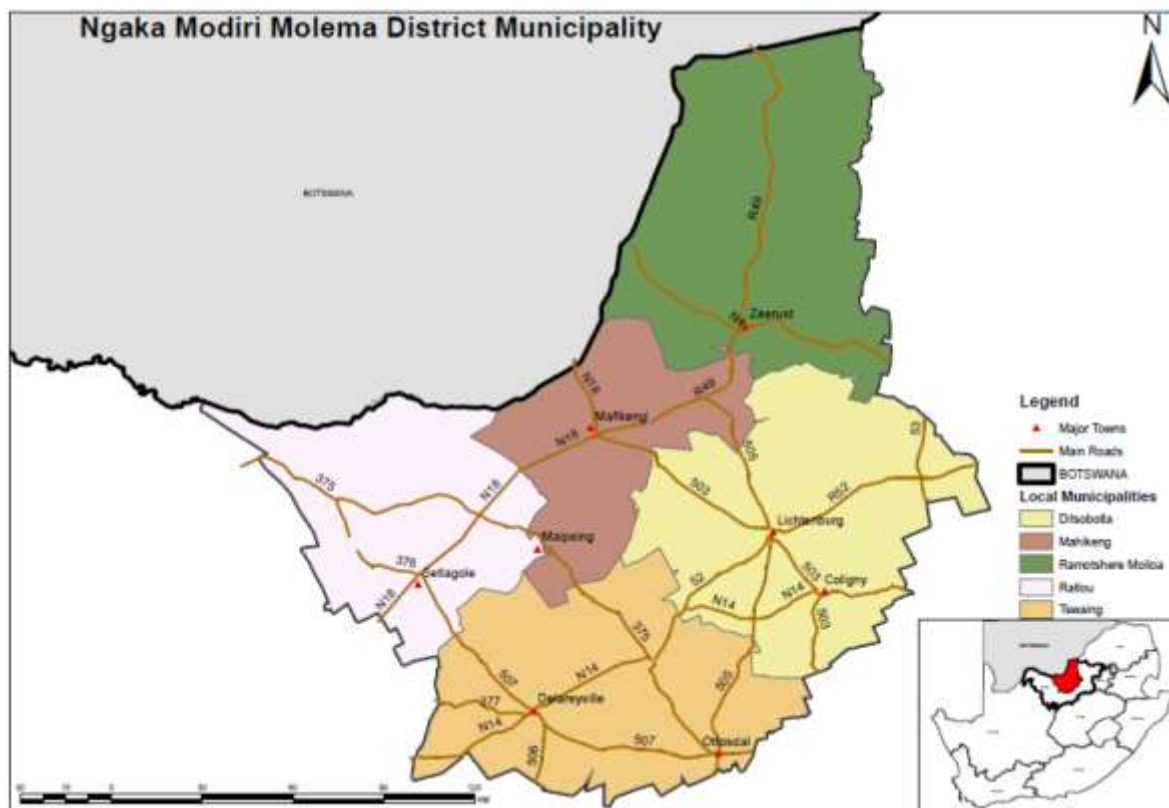
**Figure 36.** Regional terrain model depicting distance buffers around the study area and the profile lines locality (Stead, 2022).

#### 4.12 SOCIAL AND ECONOMIC CONTEXT OF THE STUDY SITE.

Tony Barbour Consulting (Barbour, 2022) undertook Scoping level Social study for the proposed Verbena PV (Annexure E6). The following has been summarised from this report.

#### 4.12.1 Administrative Context

The study area is located within the Ditsobotla Local Municipality, which forms part of the Ngaka Modiri Molema District Municipality. The District Municipality is made up of five Local Municipalities namely, Ditsobotla, Mahikeng, Ramotshere Moiloa, Ratlou and Tswaing. The town of Lichtenburg is the administrative seat of the Ditsobotla Local Municipality. The project area is located in Ward 16 of the Ditsobotla local Municipality.



**Figure 37:** Location of Ngaka Modiri Molema District Municipality and Ditsobotla Local Municipality (Barbour, 2022).

#### 4.12.2 Demographic Overview

The population of the Local Municipality in 2016 was 181 866. Of this total, 36.1% were under the age of 18, 59.2% were between 18 and 64, and the remaining 4.8% were 65 and older. The population of Ward 16 in 2011 was 8 374. Of this total, 39.2% were under the age of 18, 55.1% were between 18 and 64, and the remaining 5.4% were 65 and older.

In terms of race groups, Black Africans made up 91.1% of the population on the Local Municipality, followed by Whites, 6.7% and Coloureds, 1.7%. In Ward 16, Black Africans made up 88.2% of the population, followed by Whites, 8.1% and Coloureds, 2.9%. The main first language spoken in both the DLM and Ward 16 was Setswana, 83.7% and 83.3% respectively followed by Afrikaans.

There were a total number of 54 154 (2016) and 2 408 (2011) households in the DLM and Ward 16 respectively. Of these 68.4% (DLM) and 60.4% (Ward 16) were formal houses. 10.1% of the structures in the DLM and 28.9% in Ward 16 were shacks. A high percentage of the dwellings in Ward 16 are therefore informal structures. The majority of the formal structures in the DLM (58.7%) and Ward 16 (60.9%) were owned and fully paid off. 19.3% of the structures in Ward 16 were occupied rent free. This



figure reflects the rural nature of Ward 16 and the rent-free status of farm workers. Approximately 33.5% of the households in the DLM and 27.7% of the households in Ward 16 were headed by women. These figures are lower than the rate for the NMMDM (42.6%) and North West (36.4%). Despite the figures for the DLM being lower than the district and provincial averages, women headed households tend to be more vulnerable.

Based on the data from the 2011 Census, 12.8% of the households in the DLM had no formal income, 4.2% earned less than R 4 800, 8.5% earned between R 5 000 and R 10 000 per annum, 22.3% between R 10 000 and R 20 000 per annum and 24.2% between R 20 000 and 40 000 per annum (2016). For Ward 16, 15.8% of the households had no formal income, 5.3% earned less than R 4 800, 9.9% earned between R 5 000 and R 10 000 per annum, 28.5% between R 10 000 and 20 000 per annum and 24.9% between R 20 000 and 40 000 per annum (Census 2011).

The poverty gap indicator produced by the World Bank Development Research Group measures poverty using information from household per capita income/consumption. This indicator illustrates the average shortfall of the total population from the poverty line. This measurement is used to reflect the intensity of poverty, which is based on living on less than R3 200 per month for an average sized household (~40 000 per annum). Based on this measure, in the region of 72% of the households in the Local Municipality and 84.4% in Ward 16 live close to or below the poverty line. The low-income levels reflect the rural nature of the local economy and the limited formal employment opportunities outside in the area. The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the Local Municipality. This in turn impacts on the ability of the DLM to maintain and provide services.

The official unemployment rate in the Local Municipality in 2016 was 14.3%, while 35.5% were employed, and 43.2% were regarded as not economically active. The figures for Ward 16 in 2011 were 11.7% unemployed, 37.9% employed and 40.5% not economically active. The unemployment rates for the Local Municipality and Ward 16 are lower than the Provincial rate of 17.1% and the District rate of 14.8%. However, the COVID-19 pandemic is likely to have resulted in an increase in unemployment rates in both the Local Municipality and Ward 16. Recent figures released by Stats South Africa also indicate that South Africa's unemployment rate is in the region of 36%, the highest formal unemployment rate in the world.

In terms of education levels, the percentage of the population over 20 years of age in the DLM and Ward 16 with no schooling was 8.9% (2016) and 21.7% (2011) respectively, compared to 8.7% and 11.5% for the North West Province in 2016 and 2011 respectively. The percentage of the population over the age of 20 with matric was in the DLM and Ward 16 was 27% and 11.8% respectively, compared to 31% (2016) and 27.6% (2011) for the North West. The lower education levels are likely to be linked to rural nature of the area despite the proximity to Lichtenburg.

#### **4.12.3 Municipal Services**

Based on 2016 survey, 91.9% of households in the local municipality had access to, while 8.1% had no access to electricity. No data was on electricity access was available for Ward 16.

Based on the 2016 survey information, 80.8% of households in the Local Municipality were supplied by a service provider, while 17% relied on their own sources. For Ward 16, only 4.6% were supplied by the local service provider, while 72.6% of households relied on boreholes and 14.8% were supplied by tanker. This high reliance on boreholes reflects the rural nature on Ward 16.

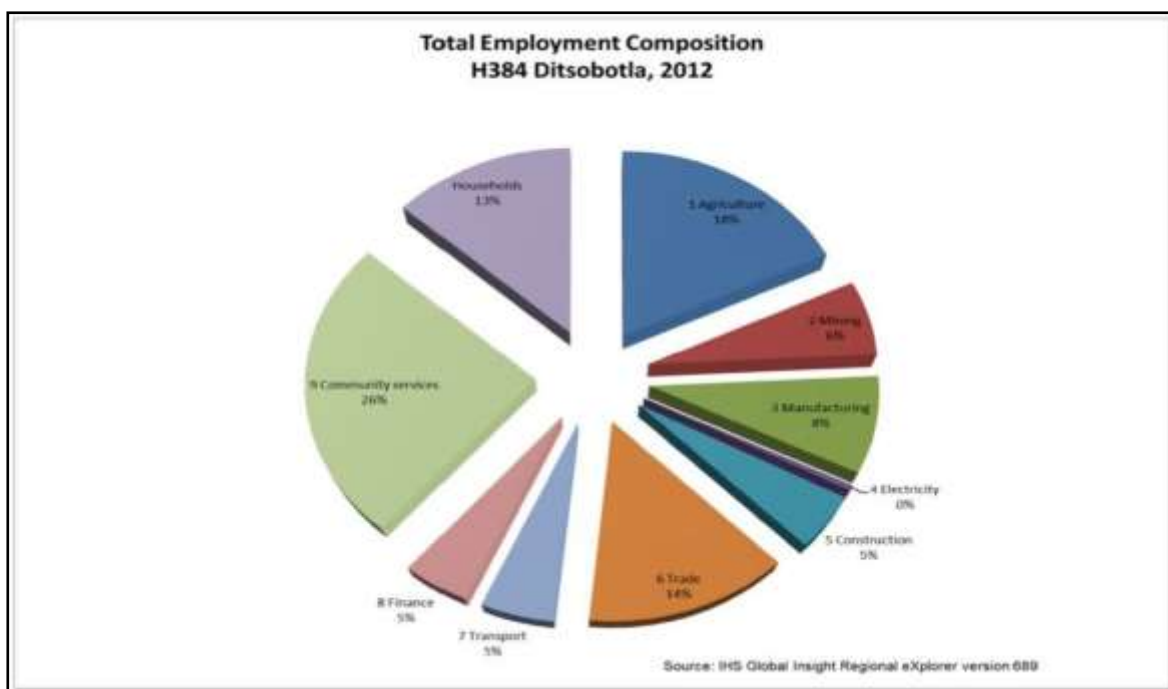
55.6% of the households in the Local Municipality had access to flush toilets, while 38.6% relied on pit toilets and 3% did not have access to formal sanitation. In Ward 16, only 16.1% of the households had access to flush toilets, while 55.8% relied on pit latrines and 23.4% had no form of formal sanitation. The high percentage of households with no formal form of sanitation reflects the high percentage of shacks (28.9%) in Ward 16.

Only 35.3% of the households in the Local had access to regular refuse removal service, while 47% disposed of their waste at their own dump and 5.9% had not access to refuse services. In Ward 16, 85.8% of households disposed of their waste at their own dump, 4.4% used communal dumps and 6.3% had no access to refuse removal services. None of the households in Ward 16 had access to refuse removal services. This reflects the rural nature of the area and the difficulty of providing municipal services to areas located at a distance from the main towns in the area.

**4.12.4 Existing Economic Overview**

The most important economic sectors are Community Services (25%), followed by Manufacturing (17%), Mining (13%) and Finance (13%). As indicated in Table 3.1, Community Services, including government, was also the most important economic sector in the District and North West Province. This highlights the importance of the government sector. However, it also highlights the reliance on the sector.

In terms of employment, the most important sector was the community services sector which accounted for 26% of the formal employment opportunities in the Local Municipality, followed by agriculture (18%), and trade (14%). The IDP notes that although the agriculture sector is a large employment creator its contribution to GDP is low (10%).



**Figure 38:** Contribution to employment of economic sectors (Barbour 2022)

**4.13 ECONOMIC CONTEXT OF THE PROPOSED PROJECT**

The following economic context is however provided as part of this scoping exercise.

**4.13.1 Project cost overview**

Renewable energy projects, such as the proposed solar facility, require significant capital investment. Funds of equity and debt investors either from foreign or domestic sources are obtained. The cost requirements and potential revenue are discussed in this section, sketching a business case for the development of renewable energy projects within South Africa.

The project costs consist of two parts, capital cost and running cost. The capital cost pertains to all costs incurred for the establishment of a producing facility. The running cost relates to those costs incurred to ensure that the facility operates as it should throughout its expected lifetime.

Solar PV installations can operate for many years with relatively little maintenance or intervention. Therefore after the initial capital outlay required for building the solar power plant, further financial investment is limited. Operating costs are also limited compared to other power generation technologies.

### 3.9.6 Project specific costs

The Verbena PV detailed costing has not been completed on the date of submitting this scoping report. The project is, however, based on the industry standard cost with capital expenditure that can amount to more or less R20-25M per megawatt installed capacity. The running cost of a solar PV facility is minimal related to the initial capital cost, contributing to the most significant cost of constructing and running a solar PV facility.

### 3.9.7 Revenue streams

The payback of the facility results mainly from electricity sales, intended under the current governmental programme, known as the “Renewable Energy Independent Power Producer Procurement Programme” (REIPPPP).

The IPP procurement programme portrays fixed ceiling prices for bidders to tender against in a competitive environment. The establishment of these ceiling prices is based on industry standard return on investments.

As part of the IPP procurement programme preferred bidders will enter into a power purchase agreement between the IPP generator and the Single Buyers Office/Department of Energy. National treasury provides surety, while NERSA regulates the IPP licences.

The bidding and tender procedure of the IPP procurement programme requires an approved EIA Environmental Authorisation/Record of Decision as a gate keeping criteria, where no project would be considered without the EIA Environmental Authorisation being given.

## 5. PROJECT PROGRAMME AND TIMELINES

As mentioned previously the Verbena PV is intended to be lodged under the Renewable Energy Independent Power Producers Procurement Programme (REIPPP) or other similar programme.

The programme has definite and stringent timelines, which the project should meet. Note that the Department of Energy has not yet released the exact dates of the bidding schedules, so the implementation schedule below is based on the best available information we have available at this time and is subject to change.

**Table 14:** Preliminary implementation schedule.

	Description	Timeline
1	Expected IPPPP submission date (6th round)	Last Quarter 2022.
2	Preferred bidders selected	First Quarter 2022
3	Finalisation of agreements	Second Quarter 2023
4	Procurement of infrastructure	Last Quarter 2023
5	Construction	2023 - 2024
6	Commissioning	2024

The table above clearly depicts the dependence of the project on the IPP procurement programme's timelines. Any delay or acceleration within the IPP procurement programme will have a corresponding effect on the timelines of the projects timelines.

Also, as mentioned, no official public submission dates Round 6 have been communicated by the Department of Energy.

**NOTE:** Verbena PV intends submitting their bid during the 6<sup>th</sup> bidding window or thereafter if unsuccessful in immediate bidding rounds.

## 6. PLANNING CONTEXT

A Planning specialist will be appointed in order to consider the planning implications of the proposed facility. The results of the findings of the planning specialist will be presented in the EIR. The following key components will likely take place from a planning perspective.

- A **land use change application** for the rezoning, from **Agricultural Zone I to Special Zone**, will be lodged at the Ditsobotla Local Municipality, in accordance with the North West Planning and Development Act (Act 7 of 1998).
- If there are restrictive Title Deed conditions burdening the proposed development, an application for the removal thereof will be lodged at the Government of the North West Province, Department: Corporate Governance and Traditional Affairs, in accordance with the Removal of Title Deed Restriction Act (Act 84 of 1967).
- Parallel to the rezoning application, a **long term lease application will be lodged at the National Department of Agriculture**, in accordance with the Subdivision of Agricultural Land Act (Act 70 of 1970).
- Relevant planning documents, on all spheres of Government, will be evaluated before any land use change application is launched. These documents include, but are not limited to the following: **NSDP** (National Spatial Development Perspective); **PGDS NC** (Provincial Growth and Development Strategy), North West Province; **IDP** (Integrated Development Plan); **SDF** (Spatial Development Framework).

The planning specialist will furthermore likely engage with the following authorities as part of the planning process. Where relevant, these authorities will also be engaged with as part of the Environmental Process and will be given an opportunity to provide input and comment on this

- **Ditsobotla Municipality** for approval in terms of the relevant Zoning Scheme;
- North West Department of Agriculture as well as the National Department of Agriculture, Forestry & Fisheries (DAFF) for approval in terms of Act 70 of 70 (SALA) and Act 43 of 83(CARA);
- **District Roads Engineer** for comment on the land use application;
- **Department of Water and Sanitation** (DWS) for comment in terms of the National Water Act and the land use application;
- **Department of Mineral Resources** for approval in terms of Section 53 of Act 28 of 2002;
- **Department of Transport & Public Works** for comment on the land use application;
- **South African Heritage Resource** (SAHRA) Agency for comment on the land use application;
- **Civil Aviation Authority** for comment on the land use application;
- **Eskom** North West for comment on the land use application; and
- **North West Nature Conservation** for comment on the land use application.

## 7. PUBLIC PARTICIPATION & STAKEHOLDER ENGAGEMENT

Section 41 in Chapter 6 of regulation 982 details the public participation process that has to take place as part of an environmental process.

A public Participation Plan has been prepared and approved by the DFFE (A copy of the Public Participation Plan is attached in Annexure F6 and the approval Thereof is attached in Annexure F7. Further details on the outcome of the initial public participation and proof of all actions that have taken place will be included in the Final Scoping Report.

The public participation plan was submitted in compliance with regulation GNR660 published on 05 June 2020 in terms of the Disaster Management Act .In compliance with section 5.1 and annexure 2 of these regulations a public participation plan must be presented to the competent authority for approval prior to implementation. The mechanism of a pre-application meeting will be utilised to present this plan to the Department for approval. The request for pre-application meeting is submitted to the Department at the same time as this submission. The approval / refusal of this plan will be included in the minutes of this pre-application meeting.

Section 40(2) in Chapter 6 of regulation 982 requires that the public participation process contemplated in this regulation must provide access to all information that reasonably has or may have the potential to influence any decision with regard to an application unless access to that information is protected by law and must include consultation with—

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

### 7.1 CONSULTATION WITH AUTHORITIES AND ORGANS OF STATE.

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

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

- Transnet National Ports Authority.
- DFFE – Biodiversity Conservation Directorate.
- The local municipality.
- The district authority.
- North West Department of Economic Development, Environment, Conservation and Tourism
- The Department of Water and Sanitation
- Local Catchment management Agency

- Department of Agriculture
- Provincial Roads Authority
- SANRAL
- CAA
- Provincial Heritage Authority
- South African Heritage Resources Agency
- Department of Mineral Resources
- Department of Energy
- Eskom
- South African Weather Service
- South African National Defence Force

## 7.2 CONSULTATION WITH POTENTIAL I&APs:

In terms of point d above, all Interested & Affected Parties (I&APs) that are identified or register as part of the process will be provided access to the DSR, DEIR, DEMPr and all specialist reports and plans via the following:

- The digital copy of the documentation that will be on the Cape EAPrac website and direct download link.
- Potential and registered I&APs will be informed that copies of the documentation can be provided via postal or courier services should they not have access to the digital platforms provided.

## 7.3 GENERAL REQUIREMENTS

Section 41 in Chapter 6 of regulation 982 details the public participation process that has to take place as part of an environmental process. The table below provides lists these requirements along with the proposed actions in order to comply with both Section 41 in regulation 982 as well as well as section 5.1 and annexure 2 of regulation 660.

**Table 15:** General Requirements in terms of Section 41 of Chapter 6 of the EIA Regulations.

Regulated Requirement	Proposed Actions
(1) If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land. (2) Subregulation (1) does not apply in respect of- (a) linear activities;	A landowner consent for the development has been obtained in terms of this requirement and no deviation or additional actions in terms of regulation 660 is required.
The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by -	
(a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of -	2 site notices have been at the boundary of the property and the main access point to the property. No deviation or

Regulated Requirement	Proposed Actions
(i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) any alternative site;	additional actions in terms of regulation 660 are required in this regard.
(b) giving written notice, in any of the manners provided for in section 47D of the Act, to -	
(i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;	The landowner has been requested to assist with identification and notification of all tenants and occupiers on the properties. No deviation or additional actions in terms of regulation 660 are required in this regard.
(ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;	Owners of adjacent properties for the non linear components will be notified of this environmental process and will be provided with access to digital copies of the documentation via the website and direct download link. Landowners will be informed that copies of the documentation can be provided via postal or courier services should they not have access to the digital platforms. Such owners will be requested to inform the occupiers of the land of this environmental process and the process to obtain copies of the relevant reports.
(iii) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;	The ward councillor will notified of this environmental process and will be provided with access to the digital copies of the documentation. The Ward Councillors will be informed that copies of the documentation can be provided via postal or courier services should they not have access to the digital platforms.
(iv) the municipality which has jurisdiction in the area;	All relevant departments of the Local Municipality as well as the District Municipality will be provided with access to the digital copies of the documentation. Municipal officials will be informed that copies of the documentation can be provided via postal or courier services should they not have access to the digital platforms.
(v) any organ of state having jurisdiction in respect of any aspect of the activity; and	All organs of state that have jurisdiction in respect of the activity will be notified of this environmental process and will be provided with access to the digital copies of the documentation. Organs of State will be informed that copies of the documentation can be provided via postal or courier services should they not have access to the digital platforms.
(vi) any other party as required by the competent authority;	DFFE will be given an opportunity to comment on the DSR, DEIR and DEMPr. Should they identify additional parties that need to provide comment, copies of the documentation and opportunity to comment will be provided to such parties.
(c) placing an advertisement in - (i) one local newspaper; or (ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;	An advert calling for registration and notifying potential I&AP's of the availability of the Draft Scoping Report has been Placed in "Die Noordwester" local newspaper. There is currently no official Gazette that has been published specifically for the purpose of providing public notice of applications
(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii);and	Adverts will not be placed in provincial or national newspapers, as the potential impacts will not extend beyond the borders of the municipal area.
(e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to - (i) illiteracy; (ii) disability; or	Notifications will include provision for alternative engagement in the event of illiteracy, disability or any other disadvantage. In such instances, Cape EAPrac will engage with such individuals in such a manner as agreed on with the competent authority.



Regulated Requirement	Proposed Actions
(iii) any other disadvantage.	
<p>(3) A notice, notice board or advertisement referred to in subregulation (2) must -</p> <p>(a) give details of the application or proposed application which is subjected to public participation; and</p> <p>(b) state -</p> <p>(i) whether basic assessment or S&amp;EIR procedures are being applied to the application;</p> <p>(ii) the nature and location of the activity to which the application relates;</p> <p>(iii) where further information on the application or proposed application can be obtained; and</p> <p>(iv) the manner in which and the person to whom representations in respect of the application or proposed application may be made.</p>	All notice boards will be placed in terms of this requirement and no deviation or additional actions in terms of regulation 660 is required.
<p>(4) A notice board referred to in subregulation (2) must -</p> <p>(a) be of a size at least 60cm by 42cm; and</p> <p>(b) display the required information in lettering and in a format as may be determined by the competent authority.</p>	All notice boards have complied with this requirement.
<p>(5) Where public participation is conducted in terms of this regulation for an application or proposed application, subregulation (2)(a), (b), (c) and (d) need not be complied with again during the additional public participation process contemplated in regulations 19(1)(b) or 23(1)(b) or the public participation process contemplated in regulation 21(2)(d), on condition that -</p> <p>(a) such process has been preceded by a public participation process which included compliance with subregulation (2)(a), (b), (c) and (d); and</p> <p>(b) written notice is given to registered interested and affected parties regarding where the -</p> <p>(i) revised basic assessment report or, EMPr or closure plan, as contemplated in regulation 19(1)(b);</p> <p>(ii) revised environmental impact report or EMPr as contemplated in regulation 23(1)(b); or</p> <p>(iii) environmental impact report and EMPr as contemplated in regulation 21(2)(d);</p> <p>may be obtained, the manner in which and the person to whom representations on these reports or plans may be made and the date on which such representations are due.</p>	This will be complied with if final reports are produced later in the environmental process.
<p>(6) When complying with this regulation, the person conducting the public participation process must ensure that -</p> <p>(a) information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected parties; and</p> <p>(b) participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application.</p> <p>(7) Where an environmental authorisation is required in terms of these Regulations and an authorisation, permit or licence is required in terms of a specific environmental management Act, the public participation process contemplated in this Chapter may be combined with any public participation processes prescribed in terms of a specific environmental management Act, on condition that</p>	<p>All reports that are submitted to the competent authority will be subject to a public participation process. These include:</p> <ul style="list-style-type: none"> <li>- Draft Scoping Report</li> <li>- Draft Environmental Impact Report</li> <li>- Draft Environmental Management Programme</li> <li>- All Maps and Plans</li> <li>- All specialist reports that form part of these environmental processes.</li> </ul>

Regulated Requirement	Proposed Actions
all relevant authorities agree to such combination of processes.	

#### 7.4 NOTIFICATION OF AVAILABILITY OF DRAFT SCOPING REPORT

Automatically registered I&AP's were notified of the availability of the Draft Scoping Report for review and comment. This Draft Scoping Report is available for a 30 Day review and comment period extending from 08 March 2022 – 08 April 2022.

#### 7.5 COMMENTS AND RESPONSES ON DRAFT SCOPING REPORT

All comments received on this Draft scoping report will be considered, responded to and included in the formal scoping report.

#### 7.6 AVAILABILITY OF DRAFT SCOPING REPORT

The draft scoping report is available for a 30 day comment period extending from **08 March 2022 – 08 April 2022**. Copies of the report were available at the following locations:

- Cape EAPrac Website: [www.cape-eaprac.co.za](http://www.cape-eaprac.co.za).
- Direct download link.

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

## 8. PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

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

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

### 8.1 DESCRIPTION OF THE ALTERNATIVES TO BE CONSIDERED AND ASSESSED

Please refer to section 2.5 above where Alternatives have been considered in this scoping report and where relevant will be assessed in the impact assessment phase of this environmental process.

As mentioned earlier in the report, the intention of environmental process is that layout alternatives will not be comparatively assessed, but rather a single layout (within the selected site) will be selected

through additional specialist input and stakeholder engagement (i.e. a risk adverse approach will be followed to determine the best practicable environmental option).

In compliance with the regulations, the specialists will as a minimum assess the mitigated preferred layout as well as the No-go alternative. Other Alternatives, such as Access Alternatives and Technology Alternatives will be assessed by the EAP with input from the participating specialists.

## 8.2 ASPECTS TO BE ASSESSED

All potential impacts to on the economic, social and biophysical environments that have been identified in this scoping report will be assessed in the Environmental Impact Assessment phase of this Environmental Process.

Potential impacts of the project have been identified by the EAP and participating specialists. These are included in the table below and the significance thereof will be assessed in the Environmental Impact Report. It must be noted that this section reflects the impacts as identified during the scoping phase. Additional impacts may be identified by specialists during the Environmental Impact Assessment Phase after all the site investigations have been completed.

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

**Table 16:** Nature of Impacts to be assessed in the Impact Assessment Phase of the Environmental Process

Specialist Discipline	Nature of impact to be assessed.	Project phase	Specialist appointed.
Ecology (Terrestrial) and Aquatic	Loss and fragmentation of vegetation communities and the ESA1 areas in the vicinity of the project area	Construction, Operation and Decommissioning	The Biodiversity Company
	Negative fragmentation effects		
	Movement of faunal species		
	Direct and indirect loss and disturbance of faunal species and community		
	Direct and indirect loss and disturbance of species of conservation concern		
Avifaunal	The loss of habitat and subsequent displacement of bird species.	Construction, Operation and Decommissioning	Pachnoda Consulting, Mr Lukas Niemand
	Direct interaction (collision trauma) by birds with the surface infrastructure (photovoltaic panels) caused by polarised light pollution and/or waterbirds colliding with the panels (as they are mistaken for waterbodies).	Operation	
Agriculture	Loss of areas of grazing areas where livestock can be produced	Construction and Operation.	Terra Africa, Mariné Blaauw
	Soil compaction	Construction	
	Soil erosion	Construction and Operation	
	Loss of soil fertility through disturbance of in situ horizon organisation	Construction	
	Soil chemical pollution	Construction and Operation	
Heritage	Direct impact on heritage Resources identified within the study site.	Construction	Beyond Heritage, Mr Jaco van der Walt.
Visual	Loss of site landscape character from the removal of vegetation and the construction of the PV structures and associated infrastructure;	Construction	Visual Resource Management

Specialist Discipline	Nature of impact to be assessed.	Project phase	Specialist appointed.
	Wind-blown dust due to the removal of large areas of vegetation	Operation	Africa, Mr Stephen Stead.
	Possible soil erosion from temporary roads crossing drainage lines		
	Windblown litter from the laydown and construction sites		
	Light spillage making a glow effect that would be clearly noticeable to the surrounding dark sky night landscapes to the north of the proposed site;		
	Massing effect on the landscape from a large-scale modification;		
	On-going soil erosion;		
	On-going windblown dust		
	Movement of vehicles and associated dust;		
Windblown dust from the disturbance of cover vegetation / gravel			
<b>Social</b>	Creation of employment and business opportunities, and opportunity for skills development and on-site training.(Positive)	Construction, Operation and Decommissioning	Tony Barbour Consulting, Mr Tony Barbour.
	Impacts associated with the presence of construction workers on local communities.	Construction	
	Impacts related to the potential influx of job-seekers	Construction, Operation and Decommissioning	
	Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site.	Construction and Decommissioning	
	Increased risk of grass fires associated with construction related activities	Construction	
	Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles.	Construction	
	Impact on productive farmland	Operation	

In addition to the detailed impact assessments of the specialists listed above, a traffic and stormwater specialist will be appointed to prepare a Traffic and Transportation Plan and Stormwater Management Plan. These two plans will form part of the EMP.

### 8.3 SITE SENSITIVITY VERIFICATION

As described in the abovementioned sections of the report and in the various studies attached in Appendix E, some of the specialists scoping reports are based on the outcome of a site investigation, namely:

- Visual,
- Avifauna (and additional site visit still to take place),
- Heritage (including Archaeologist and Palaeontologist),

Other specialists have based their scoping studies on Desktop information, namely;

- Terrestrial and Aquatic Ecology (although and initial screening of the site has taken place), and
- Agriculture.

All of the specialists will be finalising their detailed site investigations in the coming months and the outcome of the Site Sensitivity Verification will be presented in the Draft Environmental Impact Report.

### 3.10 SPECIALIST STUDIES REQUIRED IN TERMS OF THE NATIONAL SCREENING TOOL

The table below reflects the specialist studies recommended in the DEA Screening tool and whether they will be included in the Draft EIR.

**Table 17:** Specialist Studies recommended in the DEA Screening Tool.

Study Recommended	Discussion
Agricultural Impact Assessment	To be undertaken
Landscape/Visual Impact Assessment	To be undertaken
Archaeological and Cultural Heritage Impact Assessment	To be undertaken
Palaeontology Impact Assessment	To be undertaken
Terrestrial Biodiversity Impact Assessment	To be undertaken
Aquatic Biodiversity Impact Assessment	To be undertaken
Avian Impact Assessment	To be undertaken
Civil Aviation Assessment	Not to be undertaken - The South Avian Civil Aviation Authority will be approached to provide input in this regard.
Defense Assessment	Not to be undertaken – the South African National Defence Force will be approached to provide input in this regard.
RFI Assessment	Not to be undertaken – The South African Square Kilometre Array (SA SKA) will be approached to provide comment in this regard.
Geotechnical Assessment	Not to be undertaken – The Council for Geoscience will be approached for comment in this regard.
Socio-Economic Assessment	To be undertaken
Plant Species Assessment	To be undertaken
Animal Species Assessment	To be undertaken

## 8.4 ASSESSMENT METHODOLOGY

All possible impacts need to be assessed – the direct, in-direct as well as cumulative impacts. Impact criteria should include the following:

### 8.4.1 Nature of the impact

This is an appraisal of the type of effect the construction, operation and maintenance of a development would have on the affected environment. This description should include what is to be affected and how.

### 8.4.2 Extent of the impact

Describe whether the impact will be: local extending only as far as the development site area; or limited to the site and its immediate surroundings; or will have an impact on the region, or will have an impact on a national scale or across international borders.

### 8.4.3 Duration of the impact

The specialist should indicate whether the lifespan of the impact would be short term (0-5 years), medium term (5-15 years), long terms (16-30 years) or permanent.

#### 8.4.4 Intensity

The specialist should establish whether the impact is destructive or benign and should be qualified as low, medium or high. The specialist study must attempt to quantify the magnitude of the impacts and outline the rationale used.

#### 8.4.5 Probability of occurrence

The specialist should describe the probability of the impact actually occurring and should be described as improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of any prevention measures).

The impacts should also be assessed in terms of the following aspects:

#### 8.4.6 Status of the impact

The specialist should determine whether the impacts are negative, positive or neutral ("cost – benefit" analysis). The impacts are to be assessed in terms of their effect on the project and the environment. For example, an impact that is positive for the proposed development may be negative for the environment. It is important that this distinction is made in the analysis.

#### 8.4.7 Cumulative impact

Consideration must be given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts must be evaluated with an assessment of similar developments planned and already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.

#### 8.4.8 Degree of confidence in predictions

The specialist should state what degree of confidence (low, medium or high) is there in the predictions based on the available information and level of knowledge and expertise.

Based on a synthesis of the information contained in the above-described procedure, the specialists are required to assess the potential impacts in terms of the following significance criteria:

- **No significance:** The impacts do not influence the proposed development and/or environment in any way.
- **Low significance:** The impacts will have a minor influence on the proposed development and/or environment. These impacts require some attention to modification of the project design where possible, or alternative mitigation.
- **Moderate significance:** The impacts will have a moderate influence on the proposed development and/or environment. The impact can be ameliorated by a modification in the project design or implementation of effective mitigation measures.
- **High significance:** The impacts will have a major influence on the proposed development and/or environment.

### 8.5 CONSULTATION WITH COMPETENT AUTHORITY.

The competent authority has been identified as the National Department of Forestry, Fisheries and the Environment. Engagement with the competent authority will be ongoing throughout the environmental process and will include the following as a minimum:

- Provided with a copy of the Draft Scoping Report for Review and comment ;

- Submission of application form and engagement on the contents of the application form;
- Responding to comments received on the draft scoping report;
- Provided with a copy of Final Scoping report for review and decision making;
- Addressing requirements in the Department's acceptance of the Draft Scoping Report;
- Provided with a copy of the Draft Environmental Impact Report for review;
- Addressing the Departments Draft Environmental Impact Report, and
- Undertaking a site inspection with the competent authority if deemed necessary.

## **8.6 PUBLIC PARTICIPATION TO BE CONDUCTED DURING THE EIA**

Please refer to **section 19** of this report where the ongoing public participation process, including aspects that will take place within the EIA phase, is discussed in detail.

## **8.7 TASKS TO BE UNDERTAKEN IN THE EIA PHASE**

In terms of the 2014 EIA regulations, an environmental impact assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include -

(a) details of -

- (i) the EAP who prepared the report; and
- (ii) the expertise of the EAP, including a curriculum vitae;

(b) the location of the activity, including:

- (i) the 21 digit Surveyor General code of each cadastral land parcel;
- (ii) where available, the physical address and farm name; and

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

(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is -

- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken;
- (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;

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

- (i) all listed and specified activities triggered and being applied for; and
- (ii) a description of the associated structures and infrastructure related to the development;

(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;

(f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location;

(g) a motivation for the preferred development footprint within the approved site;



(h) a full description of the process followed to reach the proposed development footprint within the approved site, including:

- (i) details of the development footprint alternatives considered;
- (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;
- (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;
- (iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- (v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts -
  - (aa) can be reversed;
  - (bb) may cause irreplaceable loss of resources; and
  - (cc) can be avoided, managed or mitigated;
- (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;
- (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- (viii) the possible mitigation measures that could be applied and level of residual risk;
- (ix) if no alternative development locations for the activity were investigated, the motivation for not considering such; and
- (x) a concluding statement indicating the preferred alternative development location within the approved site;

(i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including -

- (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and
- (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;

(j) an assessment of each identified potentially significant impact and risk, including -

- (i) cumulative impacts;
- (ii) the nature, significance and consequences of the impact and risk;
- (iii) the extent and duration of the impact and risk;
- (iv) the probability of the impact and risk occurring;
- (v) the degree to which the impact and risk can be reversed;
- (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and
- (vii) the degree to which the impact and risk can be mitigated;

(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;

(l) an environmental impact statement which contains -

(i) a summary of the key findings of the environmental impact assessment:

(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and

(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;

(n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;

(o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation

(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;

(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;

(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;

(s) an undertaking under oath or affirmation by the EAP in relation to:

(i) the correctness of the information provided in the reports;

(ii) the inclusion of comments and inputs from stakeholders and I&APs;

(iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and

(iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;

The Environmental Impact Report for the proposed Verbena PV energy facility will consider and comply with the legislated requirements.

## **8.8 MEASURES TO AVOID, REVERSE, MITIGATE OR MANAGE IDENTIFIED IMPACTS**

As shown in this scoping report, the proposed Verbena PV will follow a risk adverse approach, whereby primary specialist inputs will be utilised to ensure that the project is developed in such a way as to avoid impacts, thus reducing the need for further mitigation and management.

The EAP and participating specialists, as part of the impact assessment phase, will provide mitigation measures to ensure that the potential impacts are further reduced. An environmental management programme will be developed to ensure management and monitoring of additional impacts.

The following additional specialist management plans will form part of the overall Environmental Management Programme:

- Stormwater Management Plan;
- Washwater Management Plan;
- Traffic and Transportation Management Plan;
- Alien Vegetation Management Plan;
- Habitat Restoration Plan;
- Plant Rescue and Protection Plan;
- Open Space Management Plan; and
- Avifaunal Management Plan.

## **8.9 CONTENTS OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

The final impact assessment report should as a minimum include the following sections:

- Executive Summary;
- Introduction And Description Of Study;
- Methodology;
- Results;
- Assessment of Impacts (Direct, In-direct & Cumulative, including mitigation measures to reduce negative impacts and measures to enhance positive impacts and the completion of impact tables);
- Comparative Assessment between project Alternatives;
- Discussion and Recommendation for Preferred Alternative;
- Specialist recommendation for Pre-Construction, Construction and Operational Phases); and
- Conclusion.

## **9. REMAINDER OF THE ENVIRONMENTAL ASSESSMENT PROCESS**

The following process is to be followed for the remainder of the environmental process:

- This Draft Scoping Report is made available for public review and comment for a period of 30 days. Comments received on this document will be responded to and included in the Scoping Report which will again be made available to registered I&AP's and submitted to DFFE for decision making.
- All comments received will be considered and addressed and a Final Scoping Report will be submitted to the competent authority for consideration.
- Once the DFFE accepts the Scoping Report and Plan of Study for Environmental Impact Reporting, the relevant specialists will undertake and complete their respective impact assessments;
- Discussions will be held with the various specialists and project team members in order to determine how best the development concept should be amended / refined to avoid significant impacts;

- The EIR will be made available for public review and comment period of 30-days;
- The Final EIR will be submitted to the DFFE for consideration and decision-making;
- The DFFE's decision (Environmental Authorisation) on the FEIR will be communicated with all registered I&APs.

## 10. CONCLUSION & RECOMMENDATIONS

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

This Draft Scoping report summarises the process to date, reports on the findings of relevant baseline studies and outlines the requirements for the remainder of the environmental process.

*Cape EAPrac* is of the opinion that the information contained in this Draft Scoping Report and the documentation attached hereto is sufficient to allow the general public and key stakeholders (including the competent authority) to apply their minds to the potential negative and/or positive impacts associated with the development, in respect of the activities applied for.

The outcome of this scoping report, has not identified any fatal flaws associated with the development of the proposed Verbena PV Facility. The currently proposed footprint of the development may need to be adapted to avoid any sensitive features identified by the participating specialists during the EIA phase of the Environmental Process.

Subject to the outcome of the public participation process, it is Cape EAPrac's reasoned opinion that the project should proceed to the Environmental Impact Assessment phase of the environmental process.

All stakeholders were requested to review this Scoping Report and the associated appendices, and provide comment, or raise issues of concern, directly to *Cape EAPrac* within the specified 30-day comment period.

## 11. ABBREVIATIONS

AIA	Archaeological Impact Assessment
BGIS LUDS	Biodiversity Geographic Information System Land Use Decision Support
CBA	Critical Biodiversity Area
CDSM	Chief Directorate Surveys and Mapping
CEMPr	Construction Environmental Management Programme
DFFE	Department of Forestry, Fisheries and the Environment
DEA&NC	Department of Environmental Affairs and Nature Conservation
DME	Department of Minerals and Energy
EAP	Environmental Impact Practitioner
EHS	Environmental, Health & Safety
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GPS	Global Positioning System
GWh	Giga Watt hour
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
kV	Kilo Volt
LUDS	Land Use Decision Support
LUPO	Land Use Planning Ordinance
MW	Mega Watt
NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act

NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act
NPAES	National Protected Area Expansion Strategy
NSBA	National Spatial Biodiversity Assessment
NWA	National Water Act
PM	Post Meridiem; "Afternoon"
PSDF	Provincial Spatial Development Framework
S.A.	South Africa
SACAA / CAA	South African Civil Aviation Authority
SAHRA	South African National Heritage Resources Agency
SANBI	South Africa National Biodiversity Institute
SANS	South Africa National Standards
SDF	Spatial Development Framework
TOPS	Threatened and Protected Species

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<sup>16</sup> This list of references does not include the specialist reports attached in annexure E1 – E6.

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