



DRAFT ENVIRONMENTAL IMPACT REPORT

for

THEMEDA PV

on

Portion 7 of Farm Elandsfontein 34.



In terms of the

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

Prepared for Applicant: Themeda PV (Pty) Ltd.

Date: 15 August 2022

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Report Reference: DIT725/08

Department Reference: 14/12/16/3/3/2/2149

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APPROVAL FOR RELEASE

NAME	TITLE	SIGNATURE
Dale Holder	Senior Environmental Practitioner	

DISTRIBUTION

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Themeda PV (Pty) Ltd
Registered Interested and Affected Parties

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PURPOSE OF THIS REPORT:

Stakeholder Engagement

APPLICANT:

Themeda PV (Pty) Ltd.

CAPE EAPRAC REFERENCE NO:

DIT725/08

DEPARTMENT REFERENCE:

14/12/16/3/3/2/2149

SUBMISSION DATE:

15 August 2022

DRAFT ENVIRONMENTAL IMPACT REPORT

in terms of the

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

Themeda PV

Portion 7 of Farm Elandsfontein 34.

Submitted for:

Stakeholder Review & Comment

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REPORT DETAILS

Title:	Draft Environmental Impact Report for Themeda PV.
Purpose of this report:	<p>This Draft Environmental Impact Report is available to all Registered Interested and Affected parties for review and comment.</p> <p>This Draft Environmental Impact Report forms part of a series of reports and information sources that are being provided during the Environmental Impact Assessment (EIA) for the proposed Themeda PV Renewable Energy Facility in the North West Province. This is the third report in the series that that forms part of the environmental process. Registered I&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"> - Draft Scoping Report (complete), - Draft Environmental Impact Assessment Report (this report), and - Draft Environmental Management Programme <p>In accordance with the regulations, the objectives of a Environmental Impact Report is to, through a consultative process:</p> <p>(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;</p> <p>(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;</p> <p>(c) identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;</p> <p>(d) determine the nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and degree to which these impacts can be reversed, may cause irreplaceable loss of resources, can be avoided, managed or mitigated;</p> <p>(e) identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;</p> <p>(f) identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;</p> <p>(g) identify suitable measures to avoid, manage or mitigate identified impacts; and</p> <p>(h) identify residual risks that need to be managed and monitored.</p> <p>The Draft Environmental Impact Report is available for a 30 Day review and comment period from 16 August 2022 – 14 September 2022</p>
Prepared for:	Themeda PV (Pty) Ltd
Published by:	Cape Environmental Assessment Practitioners (Pty) Ltd. (Cape EAPrac)
Authors:	Mr Dale Holder
Cape EAPrac Ref:	DIT725/08
DFFE Case officer & Ref. No:	Ms Juliet Mahlangu – 14/12/16/3/3/2/2149
Date:	15 August 2022
To be cited as:	<i>Cape EAPrac</i> , 2022. Draft Environmental Impact Report for the proposed Themeda PV. Report Reference: DIT725/08. George.

TECHNICAL CHECKLIST

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

Administration		
Applicant Details	Applicant Name:	Themeda PV (Pty) Ltd Themeda PV (Pty) Ltd is a Special Purpose Vehicle (SPV) incorporated for the sole purpose of developing, constructing, and operating a proposed 120 MW solar PV facility and associated infrastructure located on Portion 7 of Farm Elandsfontein 34.
	Company Registration Number:	2022/232289/07
	BBBEE Status:	n/a
	Project Name:	Themeda PV
Site Details		
Size of the property	Description and Size in hectares of the affected property.	PV Site: ELANDSFONTEIN, being Portion 7 of Farm No 34, Title Deed number T59381/2016 situated in the Ditsobotla Municipality, North West Province, in extent 1916.9001; TOIP0000000003400007 Access Road: ELANDSFONTEIN, being Portion 7 of Farm No 34, Title Deed number T59381/2016 situated in the Ditsobotla Municipality, North West Province, in extent 1916.9001; TOIP0000000003400007
Size of the study area	Size in ha of initial study area.	530 ha
Development Footprint	This includes the total footprint of PV panels, auxiliary buildings, onsite substation, BESS, inverter stations and internal roads.	Up to 200 Ha
Technology Details		
Capacity of the facility	Capacity of facility (in MW)	Net generation (contracted) capacity of up to 120 MWac
Solar Technology selection	Type of technology	<ul style="list-style-type: none"> - PV modules and mounting structures (monofacial or bifacial) with fixed, single or double axis tracking mounting structures; - Inverter-station, transformers and internal electrical reticulation (underground cabling where practical); - Battery Energy Storage System (BESS); - Site and internal access roads (up to 10 m wide); - Auxiliary buildings (MV switch room, gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.); - Temporary and permanent laydown area; - Perimeter fencing and security infrastructure; - Rainwater Tanks; and - Grid connection solution, including: <ul style="list-style-type: none"> - Medium-voltage cabling between the project components and the facility substation; and - Up to 132 kV facility substation; <p>The facility substation will be located adjacent to the proposed Elandsfontein Collector Switching Station, adjacent to the PV arrays. It should be noted that Elandsfontein</p>

		Collector Switching Station and the (up to) 132kV overhead line to the Watershed MTS is being assessed in a separate BA.
	Structure height	Solar panels with a maximum height of ± 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: ± 5 ha Permanent Laydown Area: Less than ± 1 ha will remain in place for operations
Storage Technology	BESS	A Battery Energy Storage System (BESS).technical report is appended to this Environmental Impact Report in Appendix E8. Area: up to ± 4 ha Technology: Solid State Battery Technologies
Own-Build Grid Connection		
<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 require inverter-stations, transformers, switchgear and internal electrical reticulation (underground cabling).</p> <p>The facility substation will be located adjacent to the proposed Elandsfontein Collector Switching Station, adjacent to the PV arrays. It should be noted that Elandsfontein Collector Switching Station and the (up to) 132kV overhead line to the Watershed MTS is being assessed in a separate BA.</p>		
Auxiliary Infrastructure		
Other infrastructure	Additional Infrastructure	Auxiliary buildings of approximately 1 ha, including (but not limited to): <ul style="list-style-type: none"> • 33 kV switch room, a gate house, ablutions, workshops, storage and warehousing areas, site offices and a control centre; • Rain water tanks; and • Electrified perimeter fencing not exceeding 5 m in height.
	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.
	Details of internal roads	A network of gravel internal access roads and perimeter roads with a width of up to ± 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 preferred development footprint (Layout Alternative 2).

Location	Latitude	Longitude
PV Facility - North-West Corner	26° 06' 56.78"S	26° 05' 33.52"E
PV Facility - North-East Corner	26° 06' 47.29"S	26° 06' 05.58"E
PV Facility - South-West Corner	26° 07' 58.34"S	26° 05' 45.64"E
PV Facility - South-East Corner	26° 07' 54.12"S	26° 06' 04.99"E
Facility Substation (Centrepoint)	26° 07' 01.71"S	26° 05' 29.81"E
Main Access Road - Start	26° 08' 01.43"S	26° 04' 45.05"E
Main Access Road – Middle	26° 07' 32.84"S	26° 05' 03.27"E
Main Access Road - End	26° 07' 00.76"S	26° 05' 38.09"E

- for the proposed 120 MW **Themeda PV** energy facility and associated infrastructure located Portion 7 of Farm Elandsfontein 34, hereafter referred to as “the property”.

The **Themeda 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 120 MWAC (MegaWatts - Alternating Current) which will include:

- PV modules and mounting structures (monofacial or bifacial) with fixed, single or double axis tracking mounting structures;
- Inverter-station, transformers and internal electrical reticulation (underground cabling where practical);
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 10 m wide);
- Auxiliary buildings (MV switch room, gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Temporary and permanent laydown area;
- Perimeter fencing and security infrastructure;
- Rainwater Tanks; and
- Grid connection solution, including:
 - Medium-voltage cabling between the project components and the facility substation; and
 - Up to 132 kV facility substation¹;

CONTENTS OF AN ENVIRONMENTAL IMPACT REPORT

Appendix 3 of Regulation 982 of the 2014 EIA Regulations contains the required contents of an Environmental Impact Report. The checklist below serves as a summary of how these requirements were incorporated into this Impact Report.

¹ The Themeda PV facility intends to connect to the National Grid via the Watershed Main Transmission Substation (MTS) approximately 5.5 km east of the facility. The grid connection infrastructure associated with this grid solution (i.e. the Elandsfontein collector switching station and an up to 132kV overhead powerline) is being assessed as part of a separate Environmental Application.

Requirement	Details
(1) 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 - The EAP who prepared the report; and The expertise of the EAP, including, a curriculum vitae.	The details of the EAP are included at the beginning of this Final EIR (overleaf from the cover page). The EAP's declaration and CV is also included in Annexure G3.
(b) the location of the activity, including – The 21 digit Surveyor General code of each cadastral land parcel; Where available, the physical address and farm name; 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 Portion 7 of Farm Elandsfontein 34, in the Ditsobotla Local Municipality within the Ngaka Modiri Molema District Municipality in the Northwest Province 21 digit Surveyor General code: - C0410000000000340007
(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale.	Detailed layout plans are attached in Appendix D.
(d) a description of the scope of the proposed activity, including - All listed and specified activities triggered and being applied for; and A description of the associated structures and infrastructure related to the development.	Sections 2 and 3.2 EIR.
(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 content.	Section 3 of this EIR.
(f) A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location.	Section 2.3 of this EIR.
(g) A motivation for the preferred development footprint within the approved site.	Section 2.4 and 2.5 of this EIR.
(h) A full description of the process followed to reach the proposed development footprint within the approved site, including - <ul style="list-style-type: none"> • Details of the development footprint alternatives considered; • Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; • 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; • The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; • The impacts and risks identified, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts - can be reversed; may cause irreplaceable loss of resources; (and can be avoided, managed or mitigated). • The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks; • 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; • The possible mitigation measures that could be applied and level of residual risk; 	Sections 2.4, 2.5, and sections 9 of this EIR. Please also refer to Annexures F2, F4 and F5 for the evidence of the initial public participation that took place during the scoping phase.

Requirement	Details
<ul style="list-style-type: none"> If no alternative development locations for the activity were investigated, the motivation for not considering such: and A concluding statement indicating the preferred alternative development location within the approved site. 	
<p>(i) A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including - A description of all environmental issues and risks that were identified during the environmental impact assessment process; and 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.</p>	Please refer to the Plan of Study For EIA that Formed part of the Final Scoping Report. Also refer to section 7 of this EIR.
<p>(j) An assessment of each identified potentially significant impact and risk, including -</p> <ul style="list-style-type: none"> Cumulative impacts; The nature, significance and consequences of the impact and risk; The extent and duration of the impact and risk; The probability of the impact and risk occurring; The degree to which the impact and risk can be reversed; The degree to which the impact and risk may cause irreplaceable loss of resources; and The degree to which the impact and risk can be mitigated. 	Section 7 of this EIR
<p>(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.</p>	Section 8 of the EIR
<p>(l) An environmental impact statement which contains –</p> <ul style="list-style-type: none"> A summary of the key findings of the environmental impact assessment; 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 A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives. 	<p>Sections 7.10 and 7.11 of this EIR.</p> <p>The Site Layout Plan attached in appendix D, includes the high sensitivity features identified by the participating specialists.</p>
<p>(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.</p>	Appendix H and section 8 of this EIR.
<p>(n) The final proposed alternatives which respond to the impact management measures, avoidance and mitigation measures identified through the assessment.</p>	Section 8 of the EIR read in conjunction with sections 2.4 and 2.5.
<p>(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>	Section 8 includes a table of all mitigation measures and identifies which mitigation is included in the EMPr and which should be included as conditions of authorisation.
<p>(p) A description of assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.</p>	Section 1.3 of this EIR.
<p>(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.</p>	Section 1.1 and 7.11 of this Final EIR.
<p>(r) Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is</p>	Section 5.

Requirement	Details
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: <ul style="list-style-type: none"> The correctness of the information provided in the reports; The inclusion of comments and inputs from stakeholders and I&APs; The inclusion of inputs and recommendations from the specialist reports where relevant; and Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties. 	Annexure G3.
(t) Where applicable, details of any financial provisions for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts;	Not applicable.
(u) An indication of any deviation from the approved scoping report, including the plan of study, including – Any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and A motivation for the deviation.	No deviation from the plan of study for EIA has occurred
(v) Any specific information that may be required by the competent authority.	Refer to table below.
(w) Any other matters required in terms of section 24(4)(a) and (b) of the Act.	None.

DFFE ACCEPTANCE OF FINAL SCOPING REPORT

The Department of Forestry, Fisheries and the Environment accepted the Final Scoping Report on 23 June 2022. The acceptance of this Final Scoping Report was subject to the inclusion of certain information in the Environmental Impact Report. The table below outlines the information that the Department requested be included in the Environmental Impact Report.

Comment	Response
The Department has evaluated the submitted final SR and the Plan of Study for Environmental Impact Assessment dated 13 May 2022 and is satisfied that the documents comply with the minimum requirements of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended. The FSR is hereby accepted by the Department in terms of Regulation 22(1)(a) of the EIA Regulations, 2014, as amended. You may proceed with the environmental impact assessment process in accordance with the tasks contemplated in the Plan of Study for Environmental Impact Assessment as required in terms of the EIA Regulations, 2014, as amended.	This Draft Environmental Impact Report has been prepared in compliance with the approved Plan of Study for Environmental Impact Assessment included in the Final Scoping Report.
(a) Public Participation	
(i) The departments would like to further highlights its comments on the draft SR, more specifically the paragraph pertaining to Regulation 25 (4) which reads as follows “Please be advised that as per Regulation 25(4), “the competent authority may replace an existing valid environmental authorisation with an environmental authorisation contemplated in this regulation, indicating the extent of replacement in the environmental authorisation, if the existing valid environmental authorisation is directly related to the application for environmental authorisation”.	Kindly note that there is no existing environmental authorisation for this activity and as such, Regulation 25 (4) has no applicability to this application.
(ii) Please ensure that comments from all relevant stakeholders are submitted to the Department with the EIAR. This includes but is not limited to the Department of Water and Sanitation, the	Please refer to Annexure F2

Comment	Response
provincial Department of Agriculture, Local Municipality, the District Municipality, the Department of Water and Sanitation (DWS), the South African Heritage Resources Agency (SAHRA), , and the Department of Forestry, Fisheries and the Environment: Directorate Biodiversity and Conservation.	
(iii) Please ensure that all issues raised and comments received during the circulation of the draft SR and draft EIAr from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the final EIAr. Proof of correspondence with the various stakeholders must be included in the final EIAr. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments.	Annexure F2, F4 and F5
(iv) A Comments and Response trail report (C&R) must be submitted with the final EIAr. The C&R report must incorporate all comments for this development. The C&R report must be a separate document from the main report and the format must be in the table format as indicated in Appendix 1 of this comments letter. Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as “noted” is not regarded as an adequate response to I&AP’s comments.	Annexure F2 – This will be updated on completion of the comment period on the Draft Environmental Impact Report.
(v) Comments from I&APs must not be split and arranged into categories. Comments from each submission must be responded to individually.	Each comment is responded to separately and not grouped.
(vi) The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations, 2014, as amended.	Please refer to section 9 where a table is included to show compliance with Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations, 2014, as amended
(vii) The EAP is requested to contact the Department to make the necessary arrangements to conduct a site inspection prior to the submission of the final EIAr.	The EAP will Avail themselves to a site inspection at anytime suitable to the competent authority.
(b) Specialist assessments	
(i) The EAP must ensure that the terms of reference for all the identified specialist studies must include the following:	
A detailed description of the study’s methodology; indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisations.	Section 6.1
Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season and providing that as a limitation will not be allowed.	Section 1.3
Please note that the Department considers a ‘no-go’ area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the ‘no-go’ areas.	The EAP’s and Departments definition of no-go areas are aligned.
Should the specialist definition of ‘no-go’ area differ from the Departments definition; this must be clearly indicated. The specialist must also indicate the ‘no-go’ area’s buffer if applicable.	The EAP’s and Departments definition of no-go areas are aligned.
All specialist studies must be final, and provide detailed/practical mitigation measures for the preferred alternative and recommendations, and must not recommend further studies to be completed post EA.	Please refer to Annexures E1 – E13. None of the participating specialists have identified additional studies that need to be undertaken post EA (other than monitoring)
Should a specialist recommend specific mitigation measures, these must be clearly indicated.	Please refer for section 8.
The list of specialist studies indicated in the background information letter that is attached as Appendix F1 of the Public Participation Process Report will be regarded as the ones that will be undertaken as part of the EIA phase.	There was no background information letter attached as Appendix F1 in the Final Scoping Report. Specialists studies undertaken are those that were listed in the Plan of Study for EIR.
Regarding cumulative impacts:	

Comment	Response
Clearly defined cumulative impacts and where possible the size of the identified impact must be quantified and indicated, i.e. hectares of cumulatively transformed land.	Section 7.12
A detailed process flow to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.	
Identified cumulative impacts associated with the proposed development must be rated with the significance rating methodology used in the process.	
The significance rating must also inform the need and desirability of the proposed development.	
A cumulative impact environmental statement on whether the proposed development must proceed.	
(ii) Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defensible reasons; and where necessary, include further expert advice.	
(c) Environmental Management Programme (EMPr)	
(i) Please ensure that the mitigation measures specified in the EIAr and specialist reports are also incorporated into the EMPr. In addition, ensure that the EMPr complies with the content of the EMPr in terms of Appendix 4 of the EIA Regulations, 2014, as amended.	All the mitigation measures and Environmental Impact Management Outcomes and actions identified by the participating specialists have been incorporated into the EMPr attached in Appendix H.
(ii) Please also include in the EMPr, a recommended frequency for the auditing of compliance with the conditions of the EA and EMPr, and for the submission of such compliance reports to the competent authority.	This is defined in section 7 of the EMPr in Appendix H.
(d) Layout & Sensitivity Maps	
(i) The EIAr must provide the four corner coordinate points for the proposed development site (note that if the site has numerous bend points, at each bend point coordinates must be provided) as well as the start, middle and end point of all linear activities.	The corner point co-ordinates of the development footprint are included in the table on the previous page. The co-ordinates of all bend points are shown on the Site Layout Plan in Appendix D.
(ii) The EIAr must provide the following:	
Clear indication of the envisioned area for the proposed solar energy facility; i.e. placing of solar panels and all associated infrastructure should be mapped at an appropriate scale.	Appendix D.
Clear description of all associated infrastructure. This description must include, but is not limited to the following: <ul style="list-style-type: none"> - Internal roads infrastructure; and; - All supporting onsite infrastructure such as laydown area, guard house and control room etc. - All necessary details regarding all possible locations and sizes of the proposed satellite substation and the main substation. 	Section 2.
(iii) A copy of the final preferred layout map. All available biodiversity information must be used in the finalisation of the layout map. Existing infrastructure must be used as far as possible e.g. roads. The layout map must indicate the following: <ul style="list-style-type: none"> - Permanent laydown area footprint; - Internal roads indicating width (construction period width and operation period width) and with numbered sections between the other site elements which they serve (to make commenting on sections possible); - Wetlands, drainage lines, rivers, stream and water crossing of roads and cables indicating the type of bridging structures that will be used; 	Appendix D.

Comment	Response
<ul style="list-style-type: none"> - The location of sensitive environmental features on site e.g. CBAs, heritage sites, wetlands, drainage lines etc. that will be affected by the facility and its associated infrastructure; - Substation(s) and/or transformer(s) sites including their entire footprint; - Location of access and service roads; - Connection routes (including pylon positions) to the distribution/transmission network; - All existing infrastructure on the site, especially railway lines and roads; - Buffer areas; - Buildings, including accommodation; and - All “no-go” areas. 	
(iv) An environmental sensitivity map indicating environmental sensitive areas and features identified during the assessment process.	Appendix B. Sensitive areas are also included on the Site Layout Plans in Appendix D.
(v) A map combining the final layout map superimposed (overlain) on the environmental sensitivity map.	Appendix D.
(e) General	
(i) The EIAR must provide the technical details for the proposed facility in a table format as well as their description and/or dimensions. A sample for the minimum information required is listed under Annexure 2 below.	This table is included above.
(i) Details of the future plans for the site and infrastructure after decommissioning in 20-30 years and the possibility of upgrading the proposed infrastructure to more advanced technologies must be indicated.	Please refer to section 9 in the EMPR attached in Appendix H.
ii) Should a Water Use License be required, proof of application for a license needs to be submitted.	The Freshwater Biodiversity specialist has confirmed that the development is in the regulated zone of a wetland, but that the risk matrix indicated a low risk and as such the project should be authorised under a General Authorisation.
(iii) The EAP must provide landowner consent for all farm portions affected by the proposed project, whether the project component is linear or not, i.e. all farm portions where the access road, solar panels and associated infrastructure is to be located.	The total project is situated on portion 7 of the Farm Elandsfontein 34 for which landowner consent has been obtained.
(iv) A construction and operational phase EMPr that includes mitigation and monitoring measures must be submitted with the final EIAR.	Appendix H
The applicant is hereby reminded to comply with the requirements of Regulation 45 of GN R982 of 04 December 2014, as amendment, with regard to the time period allowed for complying with the requirements of the Regulations.	The submission of this Draft Environmental Impact Report is within the allowable timeframes.
You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an environmental authorisation being granted by the Department.	Noted – No Response Necessary.

ORDER OF REPORT

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DRAFT ENVIRONMENTAL IMPACT REPORT - OVERVIEW

1 PROJECT OVERVIEW

Cape EAPrac has been appointed by **Themeda 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 '**Themeda PV**' Energy Facility near Lichtenburg in the Northwest Province of South Africa.

Themeda PV (Pty) Ltd have an option to lease the project development area within Portion 7 of Farm Elandsfontein 34 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 road does not traverse any additional properties and as such the consent from the owner of Portion 7 of the Farm Elandsfontein 34 is applicable.

The total generation capacity (contracted capacity) of the solar facility will not exceed 120MW for input into the National Eskom grid. The project will feed into the National Grid via the existing Watershed Major Transmission Substation (MTS)

In accordance with the regulations, the objectives of this Environmental Impact Report is to, through a consultative process:

- determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;
- identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- determine the nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and degree to which these impacts can be reversed, may cause irreplaceable loss of resources, can be avoided, managed or mitigated;
- identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;
- identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;
- identify suitable measures to avoid, manage or mitigate identified impacts; and
- identify residual risks that need to be managed and monitored.

This Draft Environmental Impact Report is available for review and comment for a period of 30 Days extending from: **16 August 2022 – 14 September 2022**.

All comments received will be considered, responded to and the Final Environmental Impact Report updated where necessary.

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)**². 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:

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

Listed activity as described in GN R.983, 984 and 985	Description of project activity that triggers listed activity
Regulation GN R. 983 – Basic Assessment	
GNR 983 Item 11: The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	The proposal includes MV cabling of up to 33 Kilovolts and an on-site (facility) facility substation with a capacity of up to 132 kilovolts.
GNR 983 Item 12: The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —	Portions of the PV facility infrastructure will be constructed within 32 m of a wetland identified by the aquatic specialist.
GNR 983 Item 24: 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 Themeda PV will be up to 8m wide, but with the inclusion of side drains and gavel embankments, will exceed the threshold of this activity.
GNR 983 Item 28: 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 Themeda PV development is considered to be commercial use and the total footprint size will be up to 200ha
GNR 983 Item 56: The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre—	The existing access road from the R503 will be widened and lengthened by more than 1km in order to reach Themeda PV.

² 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.

Listed activity as described in GN R.983, 984 and 985	Description of project activity that triggers listed activity
(ii) where no reserve exists, where the existing road is wider than 8 metres;	
Regulation GN R. 984 - Scoping and Environmental Impact Reporting	
GNR 984 Item 1: .The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more,	The proposed Themeda PV will have a generation capacity of up to 120 megawatts.
GNR 984 Item 15: The clearance of an area of 20 hectares or more of indigenous vegetation.	The proposed Themeda PV will require the clearance of an area in excess of 20ha and as such exceeds the threshold of this activity.
Regulation GN R. 985 – Basic Assessment	
GNR 985 Item 4: The development of a road wider than 4 metres with a reserve less than 13,5 metres. h. North West iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; vi. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve;	The Lichtenberg Game Breeding Centre is situated approximately 5km to the East of the Themeda PV and its associated access and internal roads. A portion of Themeda PV falls within a CBA identified in the North West Province Biodiversity Sector Plan. Some of the internal roads of Themeda PV occur within this CBA.
GNR 985 Item 12: The clearance of an area of 300 square metres or more of indigenous vegetation. h. North West iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;	A portion of Themeda PV falls within a CBA identified in the North West Province Biodiversity Sector Plan. Development of the facility in these areas will include the clearance of more than 300 square metres of indigenous vegetation.
GNR 985 Item 18: 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; v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;	The Lichtenberg Game Breeding Centre which is situated approximately 5km to the East of the Themeda PV and some of the roads of this protected area. A portion of Themeda PV falls within a CBA identified in the North West Province Biodiversity Sector Plan. Some of the internal roads of Themeda PV occur within this CBA.

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.

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, Themeda PV (Pty) Ltd, is proposing the construction of a photovoltaic (PV) solar energy facility (known as the Themeda PV facility) located on a site approximately 5 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 120 MW. Please see the technical layout development report compiled by Themeda PV (Pty) Ltd attached in Annexure E7, for further information.

The development area is situated within the Ditsobotla Local Municipality within the Ngaka Modiri Molema District Municipality and is accessible via the R503, located west of the development area.

An additional 120 MW PV facility (known as Aristida PV) is concurrently being considered on the project site (within Portion 7 of Farm Elandsfontein 34) and is being assessed through a separate Environmental Impact Assessment (EIA) process.

An assessment area of approximately 530 ha was assessed as part of this EIA process and the infrastructure associated with the 120 MW facility includes:

- PV modules and mounting structures (monofacial or bifacial) with fixed, single or double axis tracking mounting structures;
- Inverter-station, transformers and internal electrical reticulation (underground cabling where practical);
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 10 m wide);
- Auxiliary buildings (MV switch room, gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Temporary and permanent laydown area;
- Perimeter fencing and security infrastructure;
- Rainwater Tanks; and
- Grid connection³ solution, including:
 - Medium-voltage cabling between the project components and the facility substation; and
 - Up to 132 kV facility substation;

5 PROFESSIONAL INPUT

The following professionals / specialists have provided input into this Environmental Impact Assessment Phase, as outlined in the Plan of Study for Impact Assessment in section 21 of the final Scoping Report.

- | | | |
|--|---|---|
| • Terrestrial and Aquatic Biodiversity | - | 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 | - | VRMA (Mr Stephen Stead) |
| • Freshwater Ecology | - | The Biodiversity Company (Multiple Authors) |
| • Engineering Layout Design | - | Euphorbia PV (Pty) Ltd |
| • Social | - | Tony Barbour Consulting (Mr Tony Barbour) |
| • Stormwater | - | SiVest |

³ The Themeda PV facility intends to connect to the National Grid via the Watershed Main Transmission Substation (MTS) approximately 5.5 km east of the facility. The grid connection infrastructure associated with this grid solution (i.e. the Elandsfontein collector switching station and an up to 132kV overhead powerline) is being assessed as part of a separate Environmental Application.

- Traffic and Transportation - Sivest
- Planning - Townscape Planning Solutions.

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 IMPACT SUMMARY AND STATEMENT

6.1 IMPACT SUMMARY

The table below summarises the status and significance of all impacts (with and without mitigation) as assessed in the sections above.

Table 2: Impact Summary of the proposed Themeda PV and associated infrastructure⁴.

Nature of Impact	Significance / Status Without Mitigation	Significance / Status With Mitigation ⁵
TERRESTRIAL BIODIVERSITY IMPACTS		
Construction Phase Terrestrial Biodiversity Impacts		
Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community, including protected species	Medium - High Negative	Low Negative
Spread and/or establishment of alien and/or invasive species	Medium Negative	Low Negative
Displacement of faunal community (possibly including SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, light, dust, vibration)	Medium - High Negative	Low Negative
Chemical pollution associated with dust suppressants	Medium Negative	Low Negative
Operational Phase Terrestrial Biodiversity impacts		
Further Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community, including protected species	Medium Negative	Low Negative
Continued Spread and/or establishment of alien and/or invasive species	Medium Negative	Low Negative
Ongoing Displacement of faunal community (possibly including SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, light, dust, vibration)	Medium Negative	Low Negative
Chemical pollution associated with measures to keep PV clean	Medium Negative	Low Negative
Decommissioning Phase Terrestrial Biodiversity Impacts		
Continued fragmentation and degradation of habitats	Medium Negative	Low Negative
Continued spread of Invasive Alien Plants	Medium Negative	Low Negative

⁴ The nature and significance of impacts outlined in this section refer to those associated with the preferred alternative.

⁵ In order to achieve the significance outlined in this column, the EMP in Appendix H and the mitigation measures outlined in section 8 need to be adopted and implemented.

Nature of Impact	Significance / Status Without Mitigation	Significance / Status With Mitigation ⁵
Displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration)	Medium Negative	Low Negative
AVIFAUNAL IMPACTS		
Construction Phase Avifaunal Impacts.		
Losses of natural habitat and displacement of birds through physical transformation, modifications, removals and land clearance. Construction of PV Panels and Associated Infrastructure	High Negative	Medium Negative
Losses of natural habitat and displacement of birds through physical transformation, modifications, removals and land clearance. Access Road (all Alternatives)	Medium Negative	Low Negative
Operational Phase Avifaunal Impacts		
The creation of novel or new avian habitat for commensal bird species or superior competitive species. This is expected to occur during the operation phase of the facility	Low Negative	Low Negative
Avian collision impacts related to the PV facility during the operation phase (collision with the PV panels).	Medium Negative	Low Negative
Decommissioning Phase Avifaunal Impacts		
The Specialist did not identify any avifaunal impacts associated with the closure and decommissioning phase of the development.		
AGRICULTURAL IMPACTS		
Construction Phase Agricultural Impacts		
Change in land use from livestock farming to energy generation	Medium Negative	Medium Negative
Soil erosion	Medium Negative	Low Negative
Soil pollution	Medium Negative	Low Negative
Operational Phase Agricultural Impacts		
Soil erosion	Medium Negative	Low Negative
Soil pollution	Medium Negative	Low Negative
Decommissioning Phase Agricultural Impacts		
Soil erosion	Medium Negative	Low Negative
Soil pollution	Medium Negative	Low Negative
HERITAGE IMPACTS.		
Construction Phase Heritage Impacts		
Impacts during the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects	Low Negative	Low Negative
Operational Phase Heritage Impacts		
Impacts on surface and sub surface heritage resources occur during the construction phase of the development and persist through all phases, i.e. they are not reversible.		
Closure and Decommissioning Phase Heritage Impacts		

Nature of Impact	Significance / Status Without Mitigation	Significance / Status With Mitigation ⁵
All Impacts on surface and sub surface heritage resources occur during the construction phase of the development and persist through all phases, i.e. they are not reversible.		
VISUAL IMPACTS		
Construction Phase Visual Impacts		
Short-term landscape change from the current rural agricultural sense of place to the semi-industrial Renewable Energy landscape.	Medium Negative	Medium to Low Negative
Operational Phase Visual Impacts		
Long-term landscape change from the current rural agricultural sense of place to the semi-industrial Renewable Energy landscape (Loss of site landscape character due to the operation of the PV structures and associated infrastructure).	Medium Negative	Low Negative
Decommissioning Phase Visual Impacts		
Short-term landscape change from the removal of the PV structures, followed by rehabilitation of the impacted areas back to agricultural lands.	Medium Negative	Low Negative
SOCIAL IMPACTS		
Construction Phase Social Impacts		
Creation of employment and business opportunities during the construction phase.	Medium Positive	Medium Positive
Potential impacts on family structures and social networks associated with the presence of construction workers.	Medium Negative	Low Negative
Potential impacts on family structures, social networks and community services associated with the influx of job seekers.	Low Negative	Low Negative
Potential risk to safety of scholars, farmers and farm workers, livestock and damage to farm infrastructure associated with the presence of construction workers on site.	Medium Negative	Low Negative
Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of grass fires.	Medium Negative	Low Negative
Potential noise, dust and safety impacts associated with construction related activities.	Medium Negative	Low Negative
The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the project etc. will damage farmlands and result in a loss of farmlands for grazing.	Medium Negative	Low Negative
Operational Phase Social Impacts		
Development of infrastructure to improve energy security and support renewable sector.	High Positive	High Positive
Creation of employment and business opportunities associated with the operational phase.	Low Positive	Medium Positive
The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to	Low Positive	Medium Positive

Nature of Impact	Significance / Status Without Mitigation	Significance / Status With Mitigation⁵
their livelihoods posed by droughts and fluctuating market prices for sheep and farming inputs, such as feed etc.		
Benefits associated with support for local community's form SED contributions.	Medium Positive	High Positive
Visual impact associated with the proposed facility and associated infrastructure and the potential impact on the areas rural sense of place.	Low Negative	Low Negative
Potential impact of the SEF on property values	Low Negative	Low Negative
Potential impact of the SEF on local tourism	Low Negative	Low Negative
Decommissioning Phase Social Impacts		
The social specialist has confirmed that the decommissioning phase social impacts will be largely similar to those associated with the construction phase of the development		
TRAFFIC IMPACTS		
Construction Phase Traffic Impacts		
Increase in Traffic	Medium Negative	Low Negative
Increase of Incidents with pedestrians and livestock	Medium Negative	Low Negative
Increase in Dust from gravel roads	Low Negative	Low Negative
Increase in Road Maintenance	Low Negative	Low Negative
Additional Abnormal Loads	Low Negative	Low Negative
Internal Access Roads (Increase in Dust from gravel roads)	Low Negative	Low Negative
New Larger Access Points	Low Negative	Low Negative
Operational Phase Traffic Impacts		
Increase in Traffic	Low Negative	Low Negative
Increase of Incidents with pedestrians and livestock	Low Negative	Low Negative
Increase in Dust from gravel roads	Low Negative	Low Negative
Increase in Road Maintenance	Low Negative	Low Negative
Additional Abnormal Loads	Low Negative	Low Negative
New / Larger Access points	Low Negative	Low Negative
Decommissioning Phase Traffic Impacts		
Increase in Traffic	Medium Negative	Low Negative
Increase of Incidents with pedestrians and livestock	Medium Negative	Low Negative
Increase in Dust from gravel roads	Low Negative	Low Negative
Internal Access Roads (Increase in Dust from gravel roads)	Low Negative	Low Negative
Increase in Road Maintenance	Low Negative	Low Negative

Nature of Impact	Significance / Status Without Mitigation	Significance / Status With Mitigation ⁵
Additional Abnormal Loads	Low Negative	Low Negative
New / Larger Access points	Low Negative	Low Negative

6.2 IMPACT STATEMENT

As can be seen in the table above, all impacts associated with the proposed Themeda PV range from **High – positive to Medium – Negative** and All Medium – High and High negative Impacts have been avoided by the avoidance of sensitive features or mitigated to acceptable levels.

None of the participating specialists identified any impacts that remain high or very-high after mitigation. The preferred layout (Layout Alternative 2) avoids the main sensitive features, (most notably Visual Agricultural Buffer around the property boundary, the Dense Grassland, ecologically sensitive ridgeline and wetland and associated buffer).

The Terrestrial Biodiversity specialist concluded that there are no fatal flaws are evident for the proposed project and that the average post-mitigation impact significance for the project is moderately low.

The Avifaunal Specialist concluded that no fatal-flaws were identified during the avifaunal assessment, but strongly recommended that the proposed mitigation measures and monitoring protocols (additional pre - and post construction monitoring) be implemented during the lifecycle of the project.

The Agricultural specialist confirmed that the development area consist mostly of shallow Mispah soils underlain by rock that has severe limitations to rainfed crop production and concluded that the project infrastructure will not interfere with the nearby High Potential Agricultural Areas on neighbouring farm portions.

The heritage specialist confirmed that the overall impact of the project is considered to be low due to the low density of artifacts within the site.

The visual specialist has concluded that the proposed development can commence due to its Alignment with National planning related to energy and job creation; Moderated zone of Visual Influence with no tourism activities or tourist view-corridors and limited receptors that are sensitive to landscape change.

The Social specialist concluded that the proposed PV Facility and associated infrastructure will result in several social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. The project will also contribute to local economic development though socio-economic development (SED) contributions. In addition, the development will improve energy security and reduce the carbon footprint associated with energy generation.

The Traffic specialist concluded that the proposed PV will have a nominal impact on the existing traffic network and is deemed acceptable from a transport perspective, provided the recommendations and mitigation measures in this report are implemented.

As such there are no fatal flaws or high post-mitigation impacts that should prevent the development from proceeding. Based on the layout provided for the assessment, Themeda PV can be supported from a terrestrial biodiversity, aquatic biodiversity, avifaunal, visual, social, heritage, agricultural and traffic point of view.

A map showing the proposed activity in relation to the key sensitive features is in attached in Appendix D. All sensitive features along with their appropriate buffers are shown in this plan. As required by the EMPr, all areas outside of the proposed development footprint are to be demarcated as no go areas.

It is Cape EAPrac's reasoned opinion that the preferred Alternative (Layout Alternative 2) can be approval by the competent Authority subject to the outcome of the public participation process and on condition that all the suggested mitigation measures are implemented, all other legislative approvals be obtained, and that the final EMPr be strictly adhered to.

7 CONCLUSIONS & RECOMMENDATIONS

This environmental process is currently being undertaken to present proposals to the public and potential I&APs and to identify and assess environmental impacts, issues and concerns raised as a result of the proposed development.

Cape EAPrac is of the opinion that the information contained in this Draft Environmental Report and the documentation attached hereto is sufficient to allow the I&APs to apply their minds to the potential negative and/or positive impacts associated with the development, in respect of the activities applied for.

This environmental process has not identified any fatal flaws with the proposal and as such it is our reasoned view that the project should be considered for authorisation, subject to the outcome of the public participation process and on condition that all the mitigation measures outlined in section 7 of the report are adopted and implemented. All specialists concur that the development as proposed (Layout Alternative 2) and Access Road Alternative 1 can be considered for approval subject to the implementation of all mitigation measures. All impacts range from high positive to medium negative and all high, very high and critical negative impacts have been avoided by the risk adverse approach or mitigated to acceptable levels.

All stakeholders are requested to review the Draft EIR and the associated appendices, and provide comment, or raise issues of concern, directly to Cape EAPrac within the specified 30-day comment period. All comments received during this comment period will be considered, responded and included in the Final EIR that will be submitted to DFFE for decision making.

It is Cape EAPrac's reasoned opinion that the preferred Alternative (Layout Alternative 2 and Access Road Alternative 1) can be approval by the competent Authority subject to the outcome of the public participation process and on condition that all the suggested mitigation measures are implemented, all other legislative approvals be obtained, and that the final EMPr be strictly adhered to.

DRAFT ENVIRONMENTAL IMPACT REPORT - MAIN REPORT

1. INTRODUCTION

Cape EAPrac has been appointed by **Themeda 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 'Themeda PV' Energy Facility near Lichtenburg in the Northwest Province of South Africa.

Themeda PV (Pty) Ltd have an option to lease the project development area within Portion 7 of Farm Elandsfontein 34 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 road does not traverse any additional properties and as such the consent from the owner of Portion 7 of the Farm Elandsfontein 34 is applicable.

The total generation capacity (contracted capacity) of the solar facility will not exceed 120MW for input into the National Eskom grid. The project will feed into the National Grid via the existing Watershed Major Transmission Substation (MTS)

In accordance with the regulations, the objectives of this Environmental Impact Report is to, through a consultative process:

- determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;
- identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- determine the nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and degree to which these impacts can be reversed, may cause irreplaceable loss of resources, can be avoided, managed or mitigated;
- identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;
- identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;
- identify suitable measures to avoid, manage or mitigate identified impacts; and
- identify residual risks that need to be managed and monitored.

This Draft Environmental Impact Report is available for review and comment for a period of 30 Days extending from: **16 August 2022 – 14 September 2022.**

All comments received will be considered, responded to and the Final Environmental Impact Report updated where necessary.

1.1 RECOMMENDATION OF THIS EIR

It is Cape EAPrac's reasoned opinion that the preferred Alternative (Layout Alternative 2) can be approved by the competent Authority subject to the outcome of the public participation process and on condition that all the suggested mitigation measures are implemented, all other legislative approvals be obtained, and that the final EMP be strictly adhered to.

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.

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 REIPPPP has been designed not only to procure energy but has also been structured to contribute to the broader national development objectives of job creation, social upliftment and broadening of economic ownership.

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 BW4⁶. 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 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 Themeda 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.

⁶ 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.

- 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 Environmental Impact report to be timeously submitted to the competent authority, the Department of Forestry, Fisheries and the Environment, for consideration.

1.3.1 Assumptions and Limitations of Avifaunal Assessment.

- It is assumed that third party information (obtained from government, academic/research institution, non-governmental organisations) is accurate and true.
- Some of the datasets are out of date and therefore extant distribution ranges may have shifted although these datasets provide insight into historical distribution ranges of relevant species.
- The datasets are mainly small-scale and could not always consider azonal habitat types that may be present on the study area (e.g. artificial livestock watering points). In addition, these datasets encompass surface areas larger than the study area, which could include habitat types and species that are not present on the study site. Therefore the potential to overestimate species richness is highly likely while it is also possible that certain cryptic or specialist species could have been overlooked in the past.
- Some of the datasets (e.g. SABAP2) managed by the Animal Demography Unit of the University of Cape Town were recently initiated and therefore incomplete.
- This company, the consultants and/or specialist investigators do not accept any responsibility for conclusions, suggestions, limitations and recommendations made in good faith, based on the information presented to them, obtained from the surveys or requests made to them at the time of this report.

1.3.2 Assumptions and Limitations of Terrestrial Biodiversity Assessment

- The assessment area was based on the area provided by the client and any alterations to the route and/or missing GIS information pertaining to the assessment area would have affected the area surveyed;
- The area was only surveyed during a single site visit and therefore, this assessment does not consider temporal trends, however sufficient to derive meaningful baseline;
- The GPS used in the assessment has an accuracy of 5 m and consequently, any spatial features may be offset by 5 m.

1.3.3 Assumptions and Limitations of Agricultural Assessment

- It is assumed that the development footprint will be within the project area of up to 207 ha that was assessed in this report;
- It is also assumed that the impacts of the grid connection will be assessed in a separate report as part of a Basic Assessment process;

- It is assumed that the project area will be fenced off and excluded as land available for any future farming activities; and
- It is further assumed that the activities for the construction and operation of the infrastructure are limited to that typical for the construction and operation of a solar PV facility, inclusive of the infrastructure listed.

1.3.4 Assumptions and Limitations of Heritage Assessment

- Literature review is not exhaustive on the literature of the area.
- Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded.
- The study only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys.
- The study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant.
- It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

1.3.5 Assumptions and Limitations of Social Assessment

- It is assumed that the development site represents a technically suitable site for the establishment of the proposed SEF and associated infrastructure.
- The strategic importance of promoting renewable and other forms of energy is supported by the national and provincial energy policies.
- Legislation and policies reflect societal norms and values. The legislative and policy context therefore plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard, a key component of the SIA process is to assess the proposed development in terms of its fit with key planning and policy documents. As such, if the findings of the study indicate that the proposed development in its current format does not conform to the spatial principles and guidelines contained in the relevant legislation and planning documents, and there are no significant or unique opportunities created by the development, the development cannot be supported.
- Some of the provincial documents do not contain data from the 2011 Census and or 2016 Household Community Survey. However, where required the relevant 2011 and 2016 data has been provided.

2. PROPOSED ACTIVITY

The Applicant, Themeda PV (Pty) Ltd, is proposing the construction of a photovoltaic (PV) solar energy facility (known as the Themeda 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 120 MW. Please see the technical layout development report compiled by Themeda 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 R503, located west of the development area.

An additional 120 MW PV facility (Aristida PV) is concurrently being considered on the project site (within Portion 7 of Farm Elandsfontein 34) and are assessed through separate Environmental Impact Assessment (EIA) processes.

An assessment area of approximately 530 ha is being assessed as part of this EIA process and the infrastructure associated with the 120 MW facility includes:

- PV modules and mounting structures (monofacial or bifacial) with fixed, single or double axis tracking mounting structures;
- Inverter-station, transformers and internal electrical reticulation (underground cabling where practical);
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 10 m wide);
- Auxiliary buildings (MV switch room, gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Temporary and permanent laydown area;
- Perimeter fencing and security infrastructure;
- Rainwater Tanks; and
- Grid connection⁷ solution, including:
 - Medium-voltage cabling between the project components and the facility substation; and
 - Up to 132 kV facility substation;

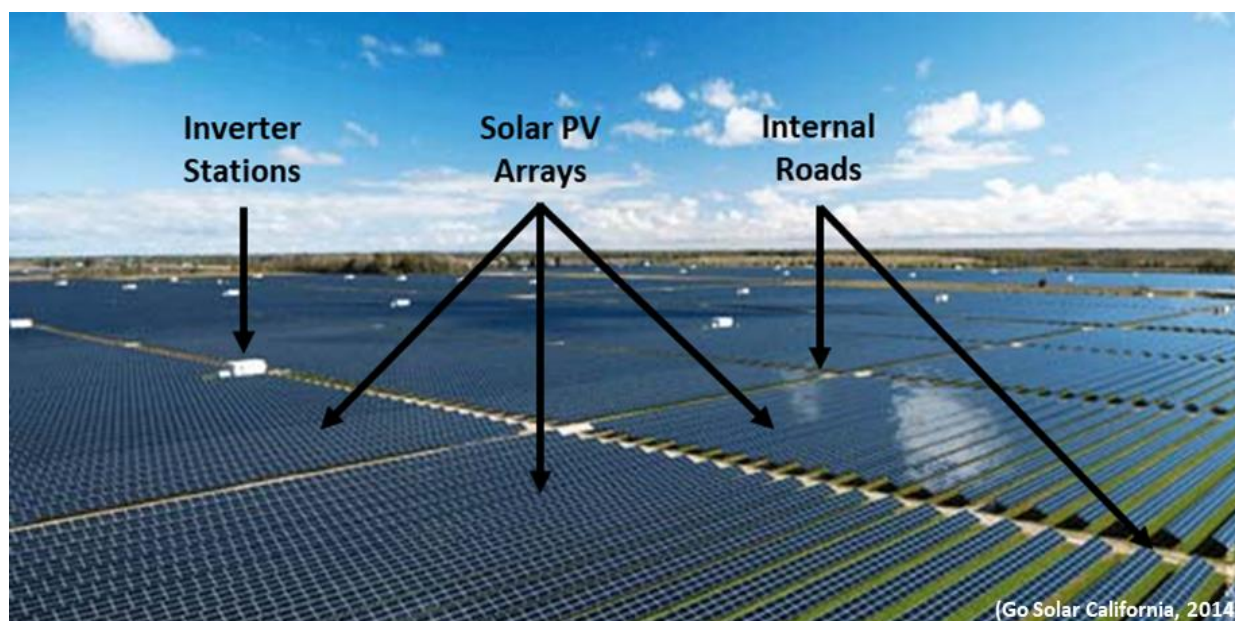


Figure 1: Typical Layout of a Solar PV Energy Facility

⁷ The Themeda PV facility intends to connect to the National Grid via the Watershed Main Transmission Substation (MTS) approximately 5.5 km east of the facility. The grid connection infrastructure associated with this grid solution (i.e. the Elandsfontein collector switching station and an up to 132kV overhead powerline) is being assessed as part of a separate Environmental Application.

Themeda PV will have a net generating capacity of 120 MW with an estimated maximum footprint of \pm 200 ha. The approximate area that each component of Themeda PV will occupy is summarised in Table 2 below.

Table 3: Component Areas and % of Total Project Area

SEF Component	Estimated Area	% of Total Area (\pm 200 ha)	% of Study Area (\pm 530 ha)
PV array	\pm 178 ha	89,00%	33,58%
Permanent and construction laydown areas	Up to 5 ha	2,50%	0,94%
Auxiliary buildings	\pm 1 ha	0,50%	0,19%
Internal roads	\pm 8 ha	4,00%	1,51%
Substation	\pm 1 ha	0,50%	0,19%
Main Road	Approx. 3 ha	1,50%	0,57%
BESS	Up to 4 ha	2,00%	0,75%

2.1 PROJECT COMPONENTS AND INFRASTRUCTURE

The following key components and infrastructure will make up the proposed Themeda 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. Driven/rammed piles and earth screws are the preferred mounting technology.



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



Figure 3: Driven/ Rammed Steel Pile (left) and Ground Screw (right) are the preferred mounting technology (Themeda 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 Themeda 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.

The images below show typical examples of the preferred mounting technology during and after installations (Photos: Cape EAPrac).



Figure 4: Pre-drilling of holes prior to the ramming of steel piles.

Note that the vegetation is not completely removed prior to the drilling and installation of the piles.



Figure 5: pre-drilled holes are backfilled with a wet sand mixture and steel piles placed in position ready for ramming.

The predrilled holes are backfilled on a continuous basis to ensure that no fauna is trapped in the holes



Figure 6: Ramming of steel piles into the pre-drilled / backfilled holes.

Note that the ramming machines follow the same entry and exit routes as the drilling rigs in order to reduce the impacts of trampling and compaction.



Figure 7: Completed racking and assembly showing vegetation remaining intact beneath the modules.



Figure 8: Showing vegetation re-establishing along the driplines of the arrays within weeks after installation.

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 Themeda PV grid connection infrastructure includes:

- Underground medium-voltage cabling between the project components and the facility substation; and
- Up to 132kV on-site facility substation.

The Themeda PV facility substation will be located directly adjacent to the Elandsfontein collector switching station in the north-western corner of the proposed development area.

The Themeda PV facility intends to connect to the National Grid via the Watershed Main Transmission Substation (MTS) approximately 5.5 km east of the facility. The grid connection infrastructure associated with this grid solution (i.e. the Elandsfontein collector switching station and an up to 132kV overhead powerline) is being assessed as part of a separate Environmental Application.

2.1.5 Access routes and internal roads

The site will be accessible via the regional road R503 located to the west of the project site.

A Traffic Specialist was appointed to provide input into this Environmental Process and particularly with regards to the access to the site.

The existing road network surrounding the proposed development is well established and provides a high degree of mobility and access. The mobility roads join the major centres and towns with each other, while access roads provide access roads to serve smaller nodes and individual properties.

The existing road networks in the North West Province are predominantly mobility roads; in most cases, the arterials and collector roads are surfaced. The surfaced roads are generally in a fair condition with many of the roads requiring remedial action in the short and medium term.

The Themeda PV facility will be located on Portion 7 of the Farm Elandsfontein 34, with one (1) possible access point emanating from Road P28-4.

The access point for the proposed development are:

Table 4: Themeda PV - Proposed Access Positions

Access No.	Road No.	Position	Access Status	Location	
Access 1	P28-4	Km 7.15	New Gravel	26°08'01.39" S	26°04'45.00" E

This new road is ± 3.0 km long and obtains access from Road P28-4 (R503). The route continues north within the Aristida PV development, not following any cadastral boundaries towards the northern farm boundary, where the road turns in an easterly direction towards the site access, O&M buildings, laydown areas, BESS and substation.

The regional road P28-4 (R503) is maintained under the auspices of NWD PWR and is classified as a Class R2 in terms of the RCAM Classification – Major Arterial Road with an average road reserve width of 36 m and a road surface of 6.0 m wide and a 2 m wide surfaced shoulder on both sides. The road has a design speed of 80 km/h.

The proposed access points are located along Road P28-4, which is indicated in the images below. The minimum required sight distance applicable to a road at 80 km/h is 250 m. Hence, the current sight distance of >350 m west and >350 m east approaching is achieved at the proposed access location. and therefore the proposed access point is acceptable.

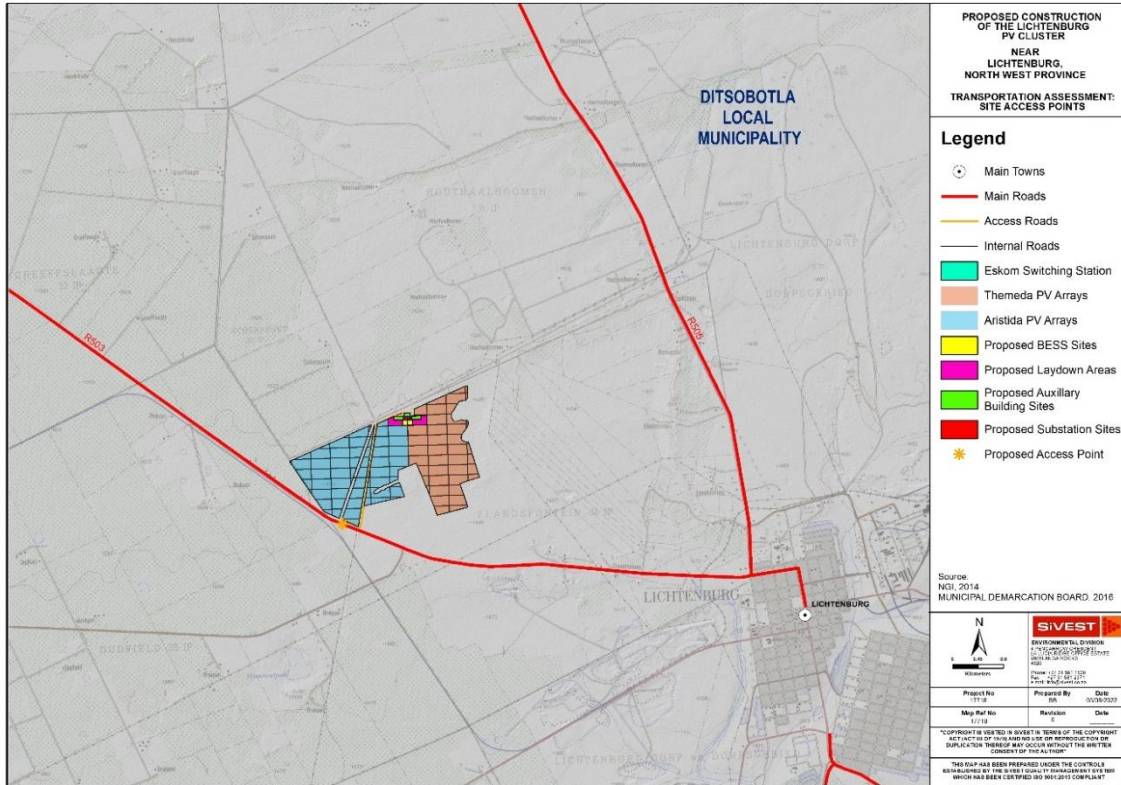


Figure 9: Themeda PV - Internal Layouts showing access point (cyan)(SiVEST, 2022)



Figure 10: Existing Road P28-4 @ Km 7.15 – East Approaching (Access 1) (Sivest 2022)



Figure 11: Existing Road P28-4 @ Km 7.15 – West Approaching (Access 1) (SiVEST, 2022)

The development will require a new access point, and approval will need to be obtained from NWDPWR. The respective internal road to the proposed development will also require upgrades to accommodate the proposed adjusted land use. The access point has sufficient sign distances on both approaches.

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

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.

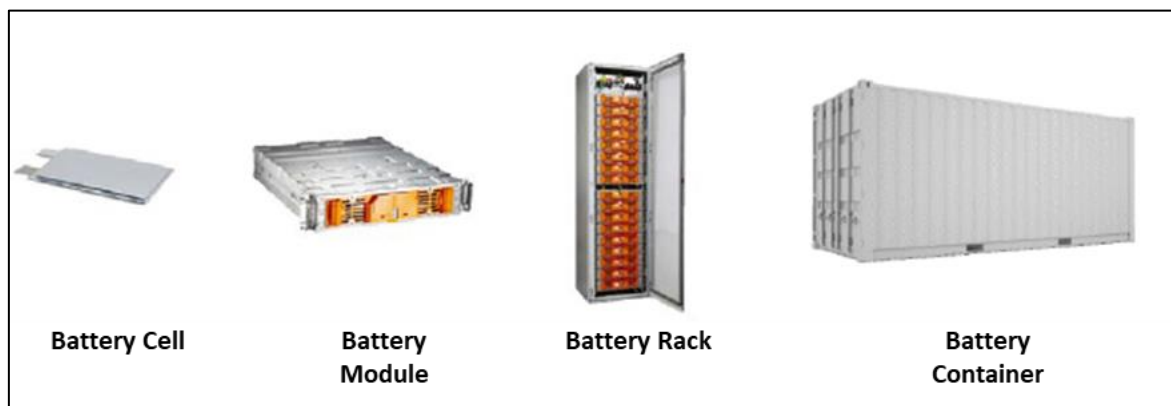


Figure 12: Typical Battery System Components.

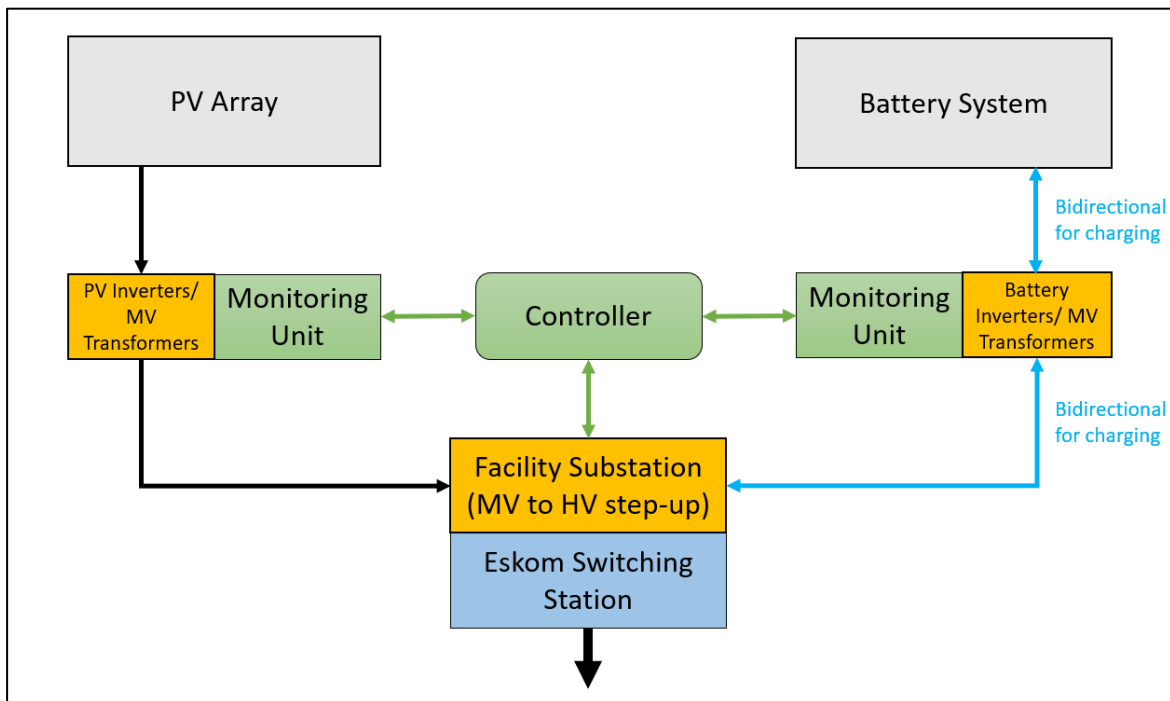


Figure 13: Typical flow diagram of PV plant with battery storage



Figure 14: 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 substation⁸.

2.2 EXTERNAL SERVICES.

The following external services will be required for the construction and operation of Themeda 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):

⁸ The position of this substation and that of the BESS, will be determined and assessed during the impact assessment phase of the environmental process.

- 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 (i.e., stored in covered containers with appropriate bunding). Refuelling areas to be in designated positions, with suitable mitigation to reduce the risk of hydrocarbon spills. In Terms of the EMPr, Spill kits will be available on site to clean up any minor spillages.



Figure 15: In compliance with the EMPr (Appendix H) Hydrocarbon Spill Kits must be in place within the site camp and in the field within 500 m of any drilling or ramming activity.

2.3 PROJECT NEED AND DESIRABILITY

In keeping with the requirements of an integrated Environmental Impact process, the DEA&DP⁹ *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 Themeda 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 120MW_{AC} Themeda 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 via various specialist assessments and 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/m²/annum.

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.

⁹ The Western Cape Provincial guidelines on Need and Desirability were considered in the absence of National and North West Province Guidelines.

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.

Themeda 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, Themeda 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, Themeda 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 Themeda 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/m²/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.

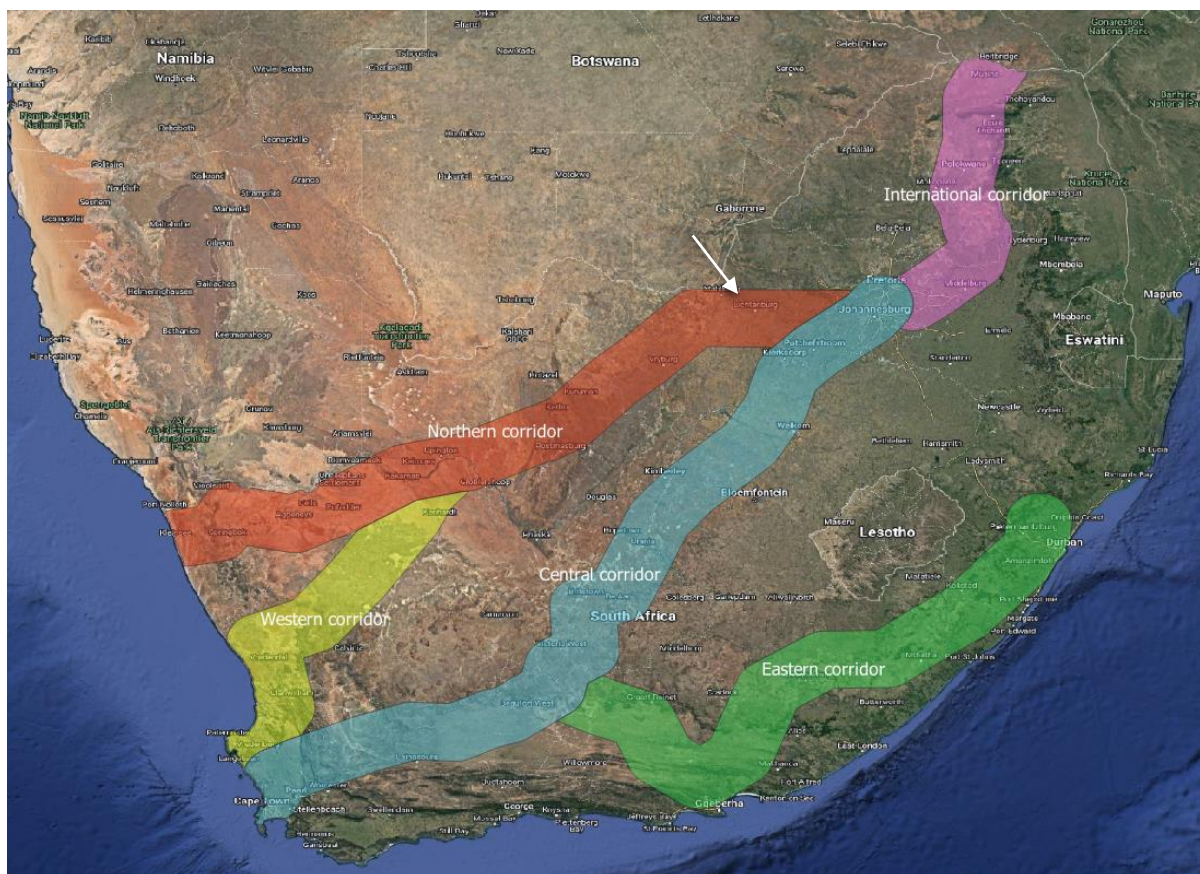


Figure 17: Eskom “Critical Power” Corridors. Themeda PV is located within the North corridor as shown by the yellow pin (Themeda PV, 2022)

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 R503 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 of the selected site) took place following the outcome of the scoping phase of the environmental process, including the specialist assessments and public participation process. A final mitigated alternative was then determined as described in the section below.

2.5 CONSIDERATION OF ALTERNATIVES

Themeda PV will consist of solar PV technology with fixed, single, or double axis tracking mounting structures, with a net generation (contracted) capacity of 120MW_{AC} 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 (directly adjacent to the main facility); and
 - Up to 132kV facility substation

2.5.1 Layout Alternatives

Due to the site selection process outlined above site layout alternatives will not be comparatively assessed, but rather a single layout (within the selected site) has been refined through specialist input and stakeholder engagement.

Based on the site selection criteria, the entire northern section of Portion 7 of the Farm Elandsfontein 34 was considered for the footprint of the facility. A proposed footprint within this portion was then identified, based on desktop information and discussions with the affected landowner as shown in the image below.

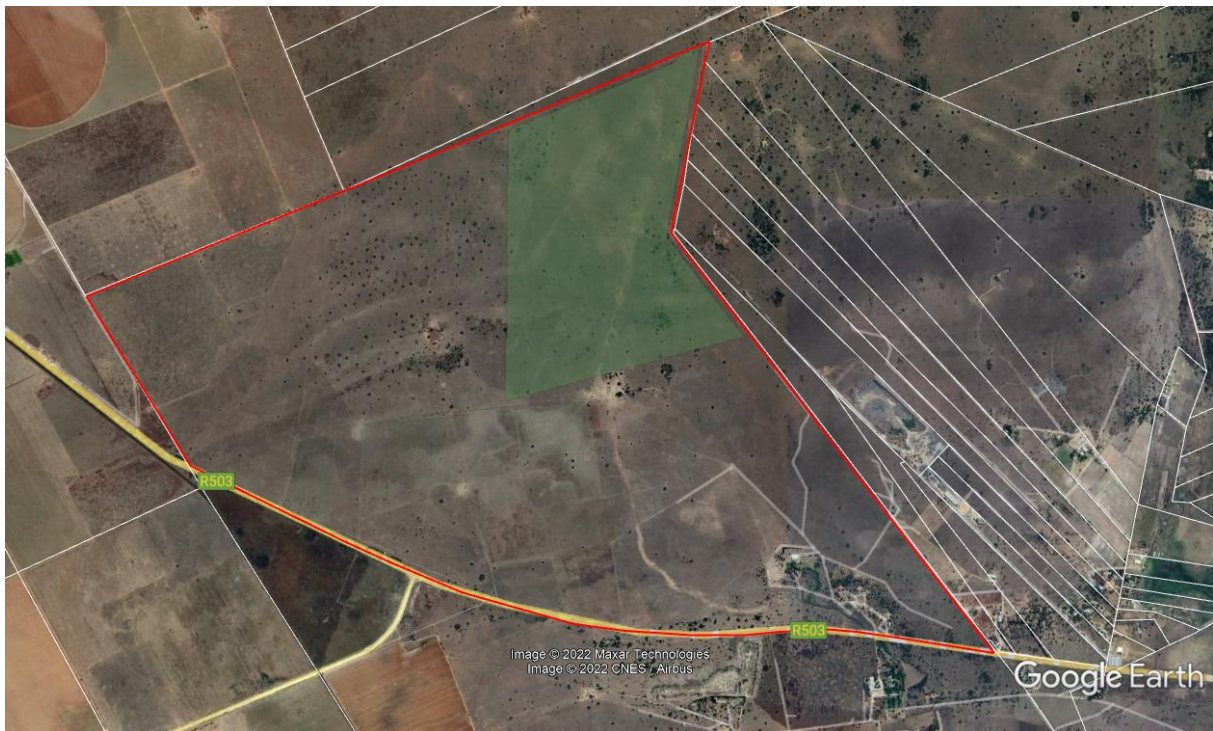


Figure 18: Initial Alternative - Themeda PV.

Following the initial alternative, the relevant participating specialists undertook their initial assessments and layout alternative 1 was developed. This layout formed the basis of the scoping phase of the environmental process.

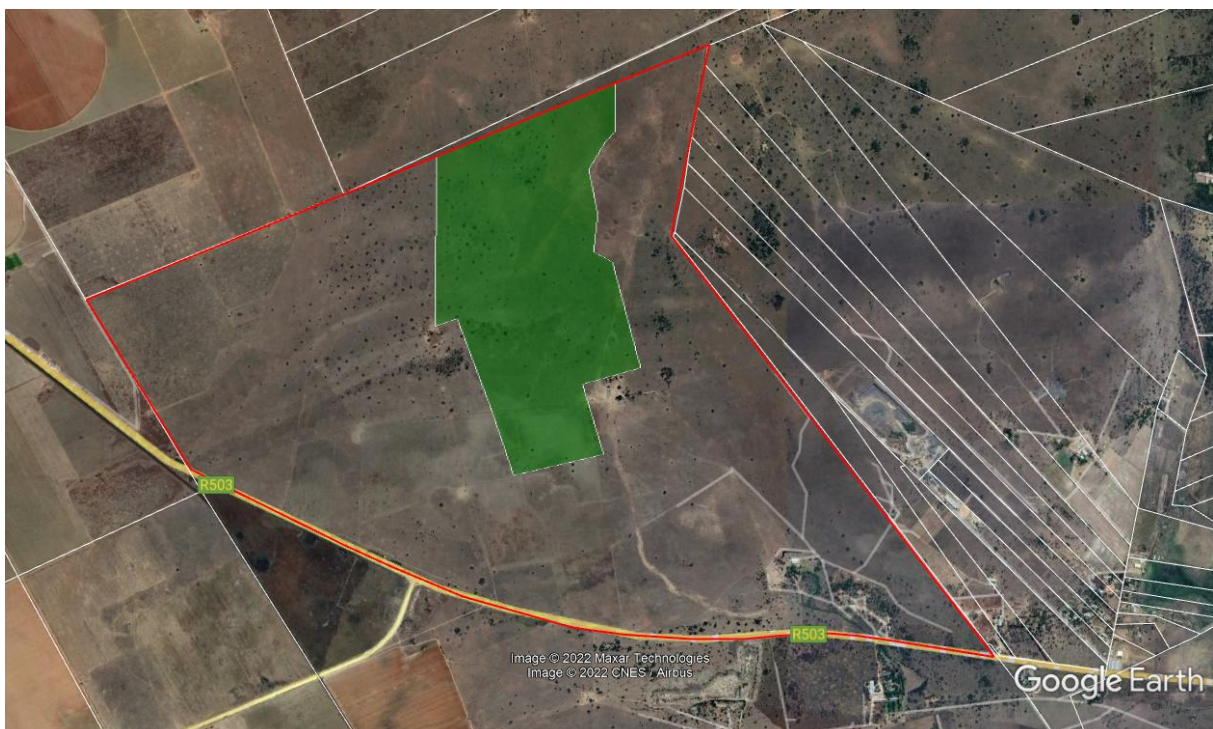


Figure 19: Layout Alternative 1 – Themeda PV

During and after the scoping phase of the environmental assessment, a number of additional sensitive features were identified by participating specialists, namely:

- Dense Grasslands (sensitive from an avifaunal perspective).

- Wetlands and associated buffers (sensitive from a terrestrial and aquatic biodiversity perspective).
- Ecologically sensitive ridge.
- Visual Setback Lines.

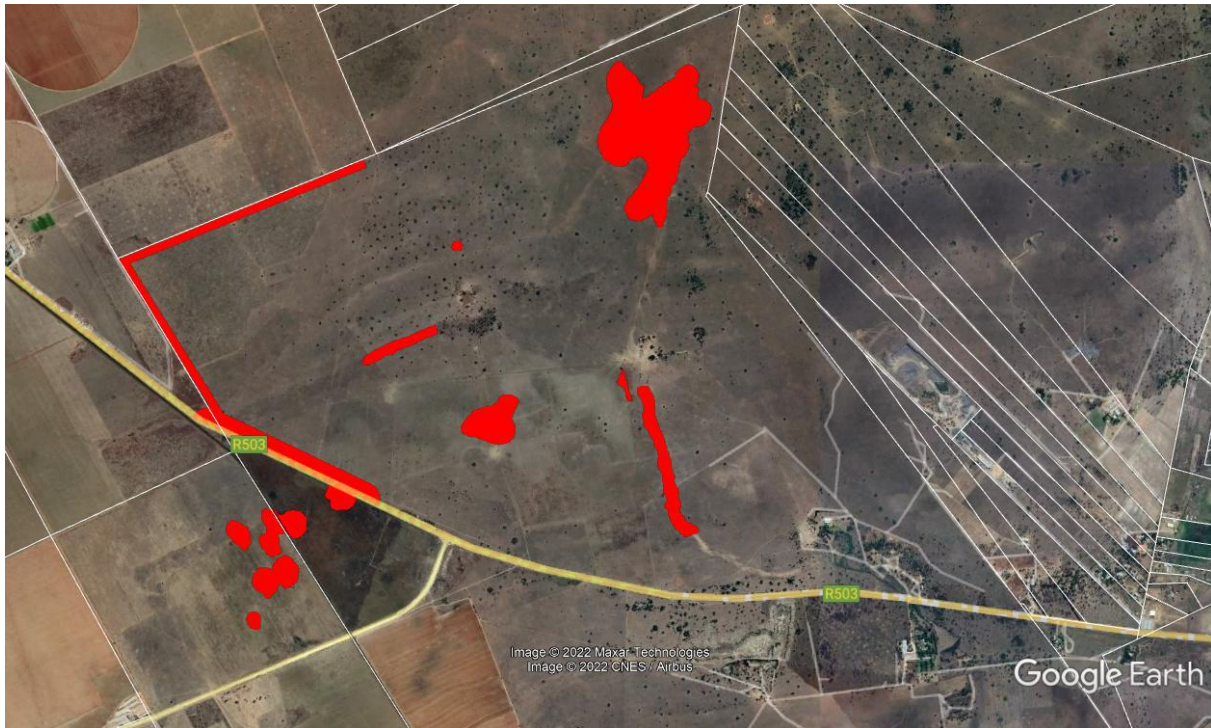


Figure 20: Sensitive features identified by participating specialists during the detailed assessments.

Following the identification the additional sensitive features, a preferred mitigated alternative (Layout Alternative 2) was developed to avoid all of the sensitive features as well as the buffers identified.

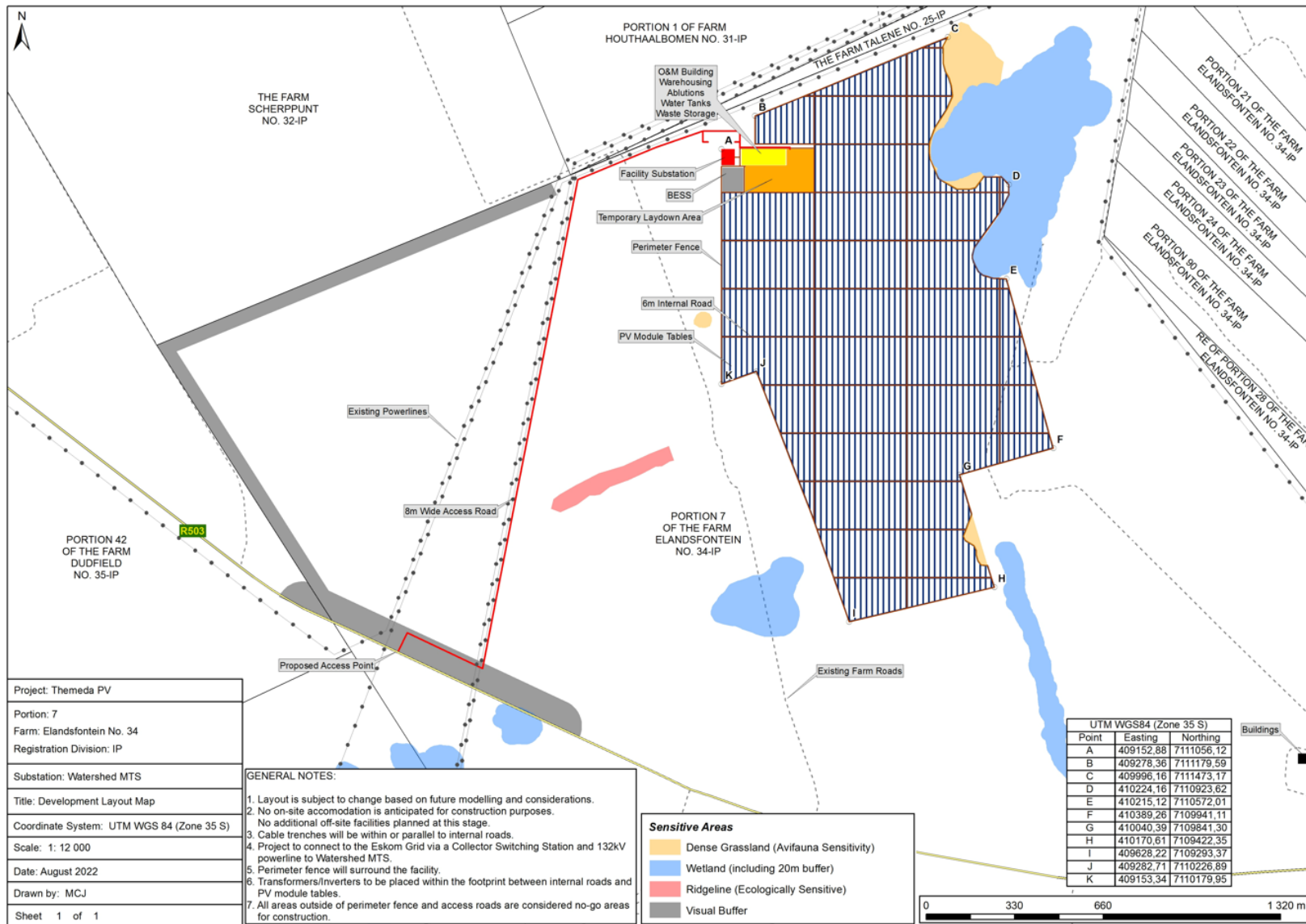


Figure 21: Layout Alternative 2 (Preferred / Mitigated Alternative) - Aristida PV.

2.5.2 Access Route Alternatives

The site will be accessible via the regional road R503 located to the south west of the project site.

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.

As outlined by the Traffic Specialist, only a single feasible access route exists, please refer to Appendix E11.

2.5.3 The no-go alternative

The no-go Alternative (or status quo) proposes that Themeda 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 Themeda 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 Themeda 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 Themeda PV, however it will be used as a baseline from which to determine the level and significance of potential impacts associated with the proposed Themeda 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.

3.1 NATIONAL LEGISLATION

This section deals with nationally promulgated or nationally applicable legislation associated with the proposed Themeda PV¹⁰.

3.1.1 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

¹⁰ This section has been prepared with input from the Social Specialist.

- 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

3.1.2 National Environmental Management Act (NEMA)

The current assessment is being undertaken in terms of the **National Environmental Management Act (NEMA, Act 107 of 1998)**¹¹. 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.

¹¹ 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.

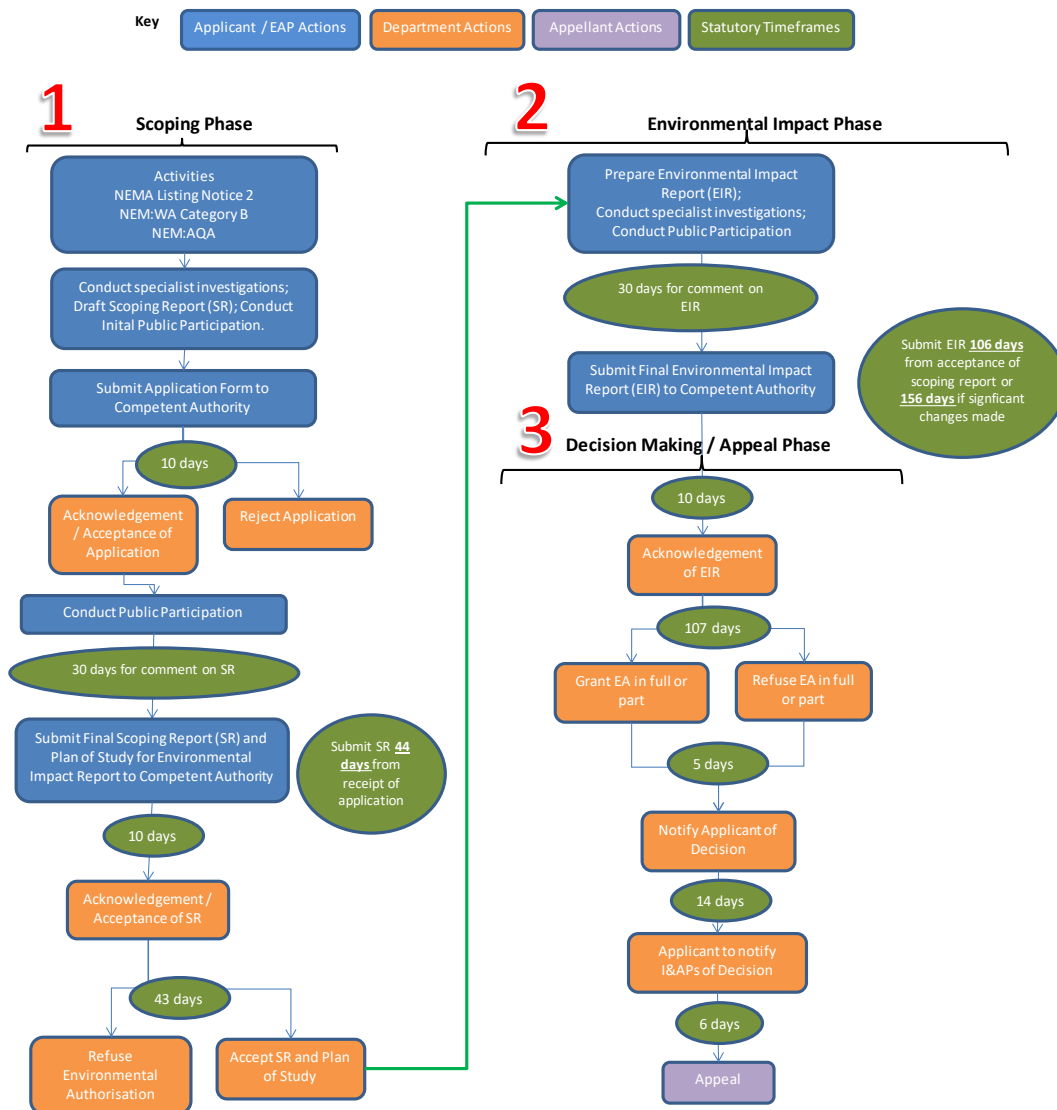


Figure 22: Summary of Scoping & EIR Process in terms of the 2014 Regulations.

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

Table 5: NEMA 2014 (As amended in April 2017) listed activities applicable to Themeda PV.

Listed activity as described in GN R.983, 984 and 985	Description of project activity that triggers listed activity
Regulation GN R. 983 – Basic Assessment	
GNR 983 Item 11: The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	The proposal includes MV cabling of up to 33 Kilovolts and an on-site (facility) facility substation with a capacity of up to 132 kilovolts.
GNR 983 Item 12: The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —	Portions of the PV facility infrastructure will be constructed within 32 m of a wetland.

Listed activity as described in GN R.983, 984 and 985	Description of project activity that triggers listed activity
GNR 983 Item 24: 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 Themeda PV will be up to 8m wide, but with the inclusion of side drains and gavel embankments, will exceed the threshold of this activity.
GNR 983 Item 28: 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 Themeda PV development is considered to be commercial use and the total footprint size will be up to 200ha
GNR 983 Item 56: 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 R503 will be widened and lengthened by more than 1km in order to reach Themeda PV.
Regulation GN R. 984 - Scoping and Environmental Impact Reporting	
GNR 984 Item 1: .The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more,	The proposed Themeda PV will have a generation capacity of up to 120 megawatts.
GNR 984 Item 15: The clearance of an area of 20 hectares or more of indigenous vegetation.	The proposed Themeda PV will require the clearance of an area in excess of 20ha and as such exceeds the threshold of this activity.
Regulation GN R. 985 – Basic Assessment	
GNR 985 Item 4: The development of a road wider than 4 metres with a reserve less than 13,5 metres. h. North West iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; vi. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve;	The Lichtenberg Game Breeding Centre is situated approximately 5km to the East of the Themeda PV and its associated access and internal roads. A portion of Themeda PV falls within a CBA identified in the North West Province Biodiversity Sector Plan. Some of the internal roads of Themeda PV occur within this CBA.
GNR 985 Item 12: The clearance of an area of 300 square metres or more of indigenous vegetation. h. North West iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;	A portion of Themeda PV falls within a CBA identified in the North West Province Biodiversity Sector Plan. Development of the facility in these areas will include the clearance of more than 300 square metres of indigenous vegetation.
GNR 985 Item 18: 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; v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;	The Lichtenberg Game Breeding Centre which is situated approximately 5km to the East of the Themeda PV and some of the roads of this protected area. A portion of Themeda PV falls within a CBA identified in the North West Province Biodiversity Sector Plan. Some of the internal roads of Themeda PV occur within this CBA.

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.

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.

3.1.3 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.

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.

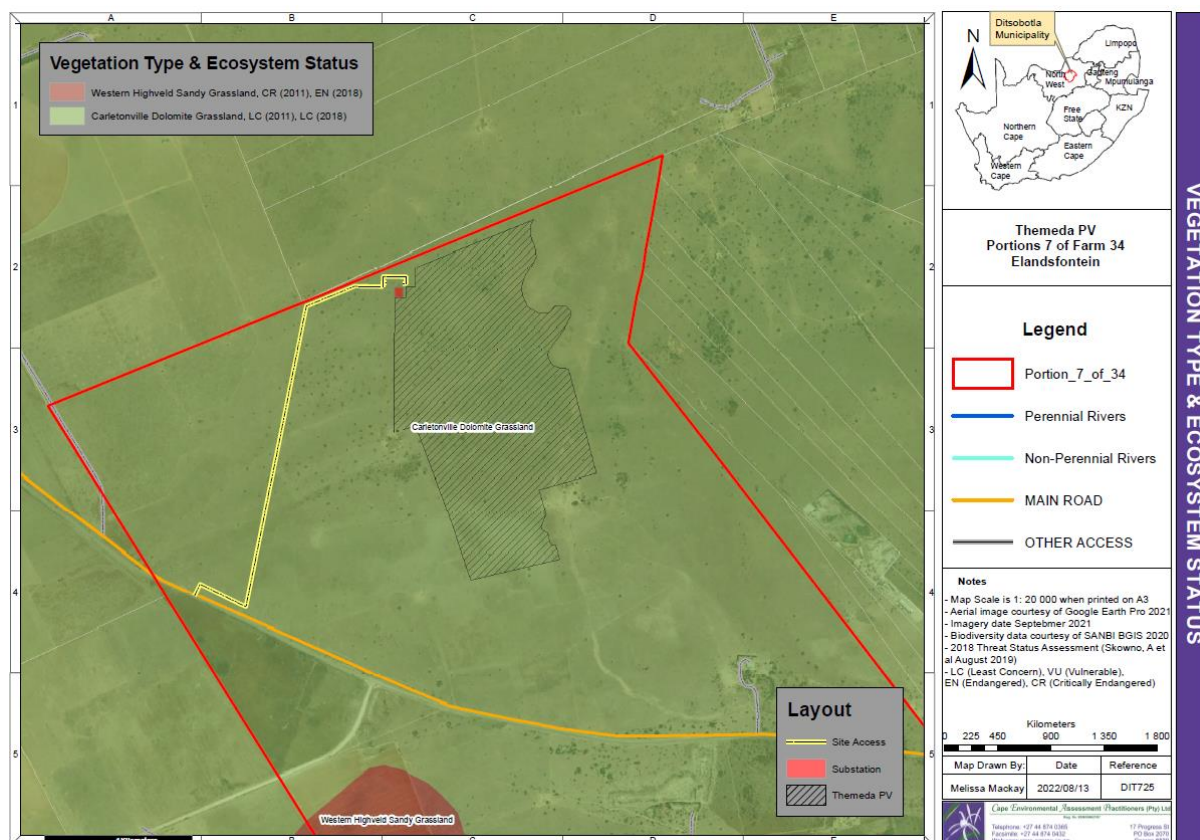


Figure 23: Broad-scale overview of the vegetation on and in proximity to Themeda PV.

Please refer to the Terrestrial Biodiversity Impact Report attached in Annexure E1, where the vegetation type on site and the implications in terms of the NEMBA are discussed in more detail.

3.1.4 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 shows 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 ~5 -7 km to the East of Themeda 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 protected areas directorate at DFFE have been further engaged to provide confirmation in this regard.

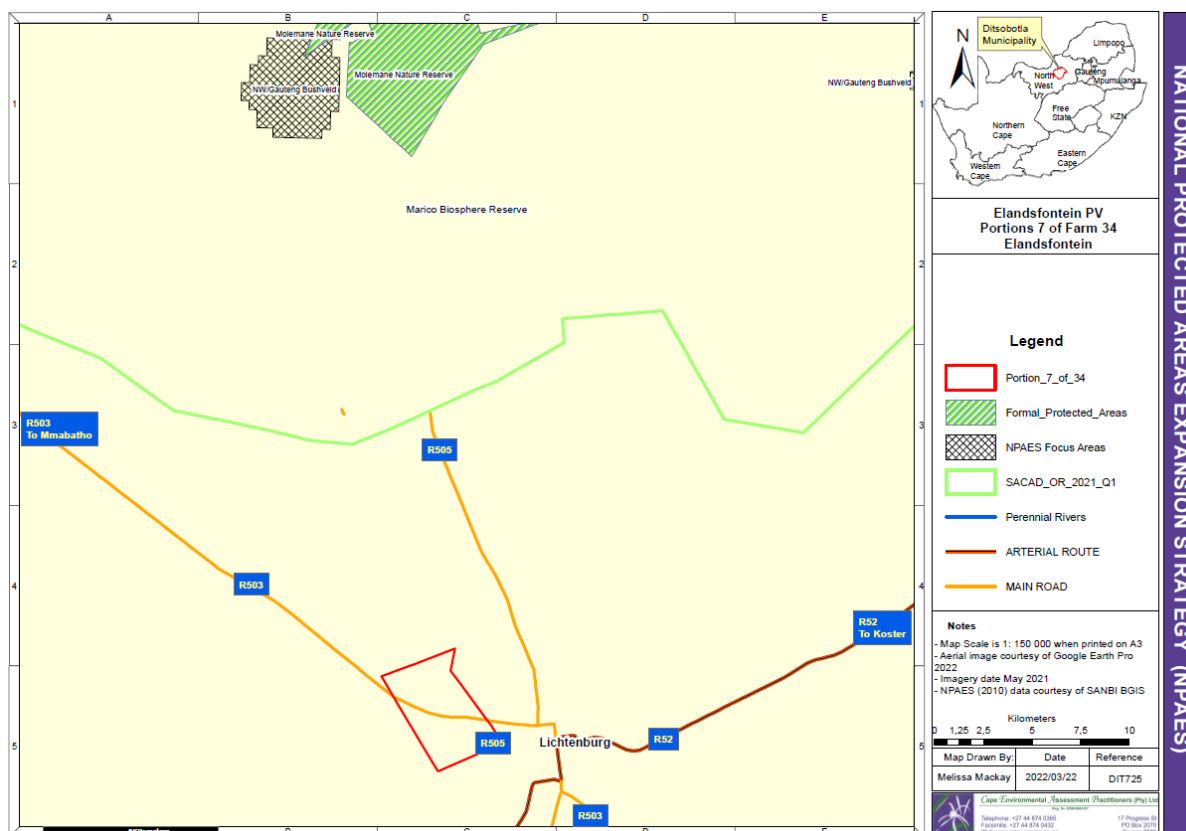


Figure 24: Protected areas and Expansion focus areas in proximity to portion 7 of the farm 34 Elandsfontein, where the proposed Themeda PV is proposed.

3.1.5 National Protected Area Expansion Strategy (NPAES) for S.A. 2008 (2010)

Considering that South Africa’s protected area network currently falls far short of sustaining biodiversity and ecological processes, the NPEAS aims to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to Climate Change. Protected areas, recognised by the National Environmental Management: Protected Areas Act (Act 57 of 2003), are considered formal protected areas in the NPAES. The NPAES sets targets for expansion of these protected areas, provides maps of the most important protected area expansion, and makes recommendations on mechanisms for protected area expansion.

According to the Terrestrial Ecology Specialist (see Annexure E1), the Themeda PV partially overlaps with a priority focus area as per the image below.

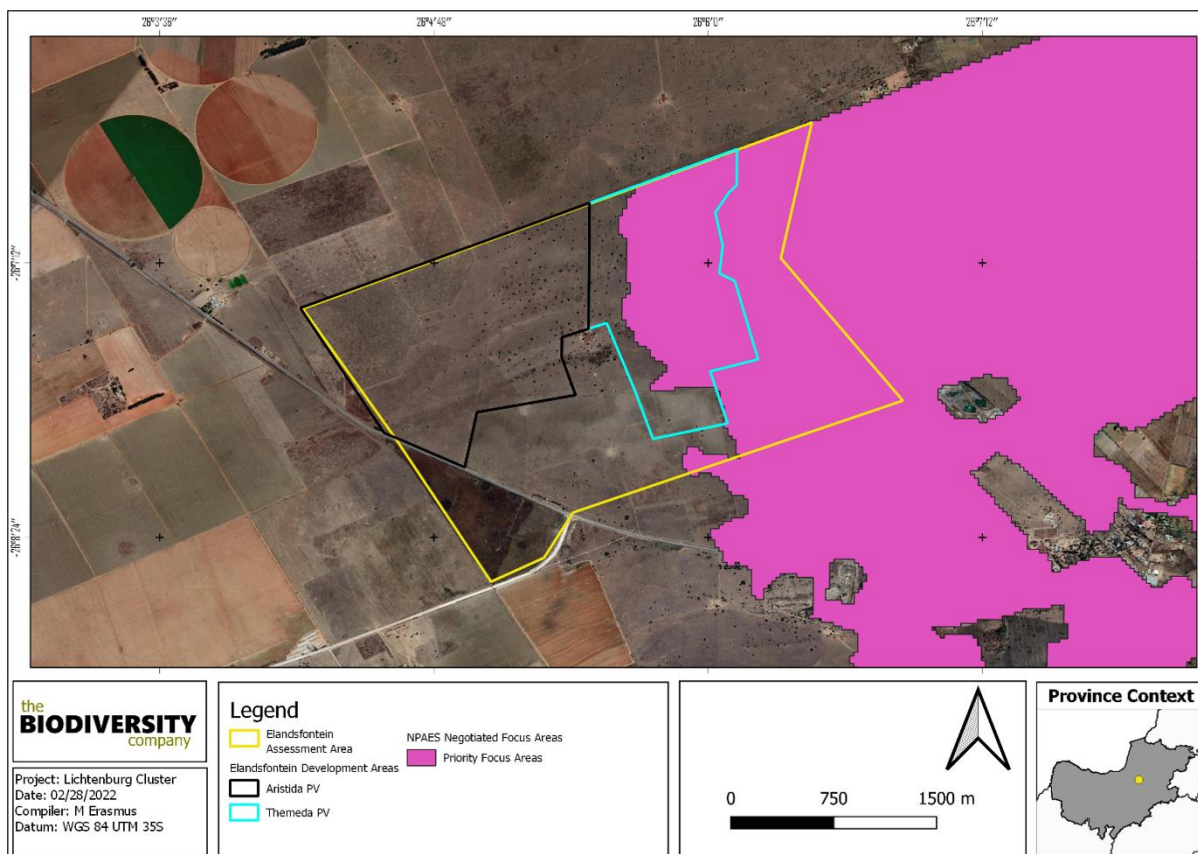


Figure 25: The project area in relation to the National Protected Areas Expansion Strategy areas

These areas depicted by the specialist in the map above are the negotiated areas which are pending declaration. The map in figure 13 in the previous section depicts the focus areas already declared.

The NPAES has declared 42 focus areas for land-based protected area expansion in South Africa. These are large intact and un-fragmented areas suitable for the creation or expansion of large protected areas. The closest focus area is the Northwest/ Gauteng Bushveld Focus Area approximately 40km North of the site. The nearest conservation area (CA) (Marico Biosphere reserve) is situated approximately 5km to the North of the site.

The proposed **Themeda PV** will **not affect** this declared focus area as it is situated considerable distance from the Focus Area. Themeda PV does however overlap with negotiated areas that are not yet declared.

3.1.6 National Forests Act (No. 84 of 1998):

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

The ecological specialist has confirmed that a *Vachellia erioloba* could be present on the site.

Please refer to the **Terrestrial Biodiversity Impact Assessment** in **Annexure E1** for a detailed description of the protected species on the site.

3.1.7 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 Themeda 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”.

Four Hydrogeomorphic units were identified by the specialist (Annexure E1) within the 500 m regulated area. Although these aquatic features occur within the regulated area (i.e. within 500m of the proposed development, the preferred layout alternative (Layout Alternative 2) has been developed to avoid these features).

3.1.8 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 m² in extent;
- the re-zoning of a site exceeding 10 000m² in extent.

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

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

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

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

These baseline assessments were submitted to SAHRA simultaneously with the DSR for input and guidance on further requirements.

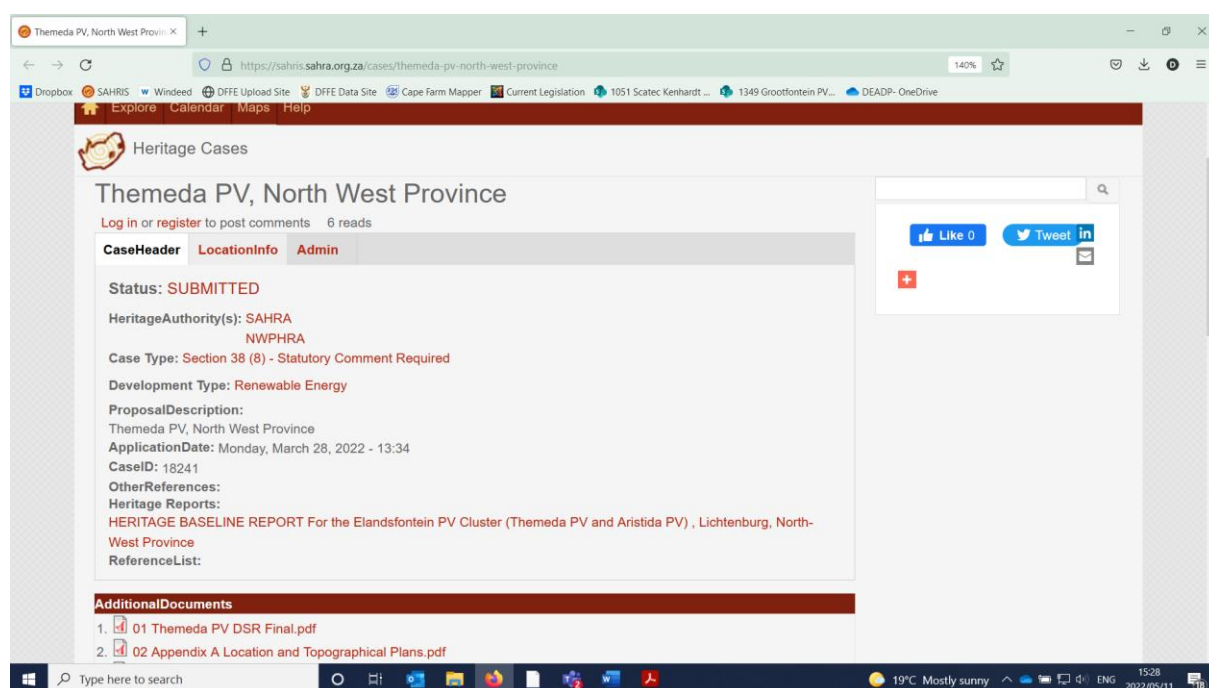


Figure 26: Heritage Baseline Assessment and Scoping Report as submitted to SAHRA via their SAHRIS System.

The Heritage Impact Assessment attached in Annexure E4, along with this Draft Environmental Impact Report will also be submitted to SAHRA for their final decision making in terms of Section 38(8) of the National Heritage Resources Act.

3.1.9 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) confirmed that Four hydrogeomorphic units were identified and assessed.

A risk assessment was conducted in line with Section 21 (c) and (i) of the National Water Act, 1998, (Act 36 of 1998). On condition that delineated wetland areas will be avoided (with a 20 m buffer)¹², the post-mitigation residual risk significance was determined to be low and a General Authorisation is required.

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 Themeda 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.

3.1.10 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.

Th proposed project is not within a declared Astronomic Geographic Advantage area and the closest SKA declared area is approximately 500km South West of the Site (SKA004). Considering the considerable distance form the closest receptor, the project is unlikely to have any impact on the SKA.

¹² The Preferred Layout Alternative (Layout Alternative 2) has been designed to avoid the delineated wetlands as well as the 20m buffer as identified by the specialist.

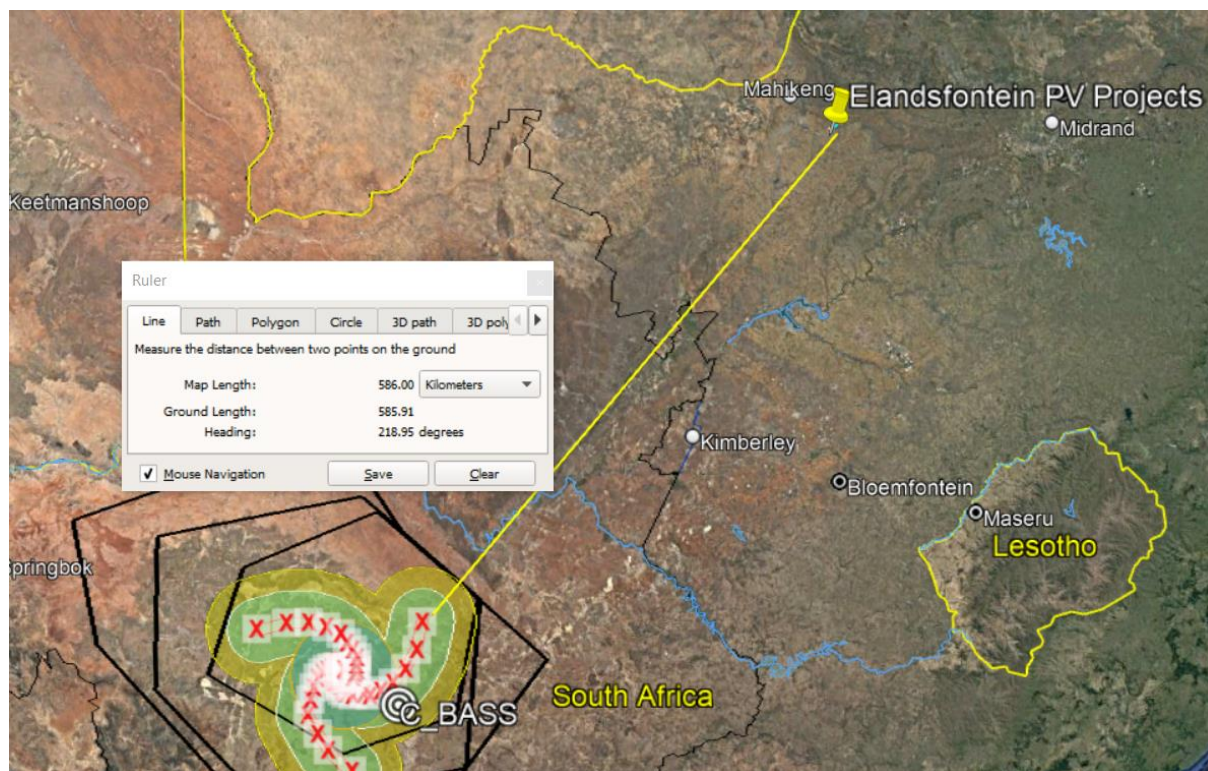


Figure 27: Showing the proximity of the proposed PV project to the closest SKA telescope.

The South African SKA Project Office and **SARAO** have been registered as a key stakeholder on this environmental process and have been requested to provide comment and input in terms of the Astronomy Geographic Advantage Act and potential impact to SKA. Neither SARAO, nor SKA provided comment during the scoping phase, but will be engaged again during this impact assessment phase.

3.1.11 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).

3.1.12 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.

3.1.13 White Paper on the Energy Policy of the Republic of South Africa

Investment in renewable energy initiatives, such as the proposed Themeda 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.

3.1.14 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.

3.1.15 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.

3.1.16 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 120MW 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.

3.1.17 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.

3.1.18 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.

3.1.19 DFFE Screening Tool and Protocols

On 20 March 2020 the Minister of Forestry, Fisheries and the Environmental published the general requirements for undertaking site sensitivity verification for environmental themes for activities requiring environmental authorisation (Government Gazette No. 43110). In terms of these requirements, prior to commencing with a specialist assessment, the current land use and environmental sensitivity of the site under consideration by the screening tool, must be confirmed by undertaking a site sensitivity verification by either an EAP or a specialist.

The Screening Tool report uses national datasets to identify site sensitivities and potential specialist studies that may be required for any particular development. Since the datasets are not ground truthed, there may be instances where the required specialist study are in actual fact not necessary.

Prior to commencing with a specialist assessment, the current use of the land [must be verified] and the environmental sensitivity of the site under consideration identified by the screening tool [must be verified] by the undertaking a site sensitivity verification (SSV) by either an Environmental Assessment Practitioner or specialist to determine the applicability of the outcomes of the Screening Tool.

The SSV must be undertaken by an EAP or a specialist.

- The site sensitivity verification was undertaken by the EAP and the participating specialists listed in Appendix E of this report.

A preliminary on-site inspection must be undertaken.

- A site inspection was conducted by Dale Holder from Cape EAPrac on the 27 January 2022 as well as by specialists during numerous assessments that have taken place.

A desktop analysis must be undertaken, alongside any other applicable/relevant information.

- A full spatial analysis in terms of existing environmental programmes has taken place and appended to this report in Appendix B.

A screening tool report was generated for the proposed Themeda 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 6: Sensitivity of the environmental themes and studies to be undertaken in terms of these sensitivities

Environmental Theme	Sensitivity	Required investigation	Discussion / Compliance
Agriculture Theme	High	Agricultural Impact Assessment	An Agricultural Impact Assessment is Attached in annexure E3.
Animal Species Theme	Low	Animal Species Compliance statement	This forms part of the Terrestrial Biodiversity Impact Assessment in Annexure E1.
Aquatic Biodiversity Theme	Very High	Aquatic Impact Assessment	An Aquatic Impact Assessment is attached in Annexure E1.
Archaeological and Cultural Heritage Theme	Low	Heritage Compliance Statement.	Notwithstanding the low theme sensitivity, a Heritage Impact Assessment was undertaken in terms of section 38(8) of the National Heritage Resources Act and is attached in Annexure E4.
Avian Theme	High	Avifaunal Impact Assessment	An Avifaunal Impact Assessment was undertaken and is attached in Annexure E2.
Civil Aviation (Solar PV) Theme	Medium	Compliance Statement	The applicant has submitted an obstacle application (Part 30-27) to the South African Civil Aviation Authority.
Landscape (Solar) Theme	Very High	Visual and Landscape Impact Assessment	A Visual Impact Assessment was undertaken and is attached in annexure E5
Plant Species Theme	Medium	Compliance Statement	This forms part of the Terrestrial Biodiversity Impact Assessment in Annexure E1.
RFI Theme	Medium	Compliance Statement	The South African Square Kilometre Array SKA-SA and SARAO were requested to provide professional comment in this regard. The proposed project is not within a declared Astronomic Geographic Advantage area and the closest SKA declared area is approximately 500km South West of the Site (SKA004). Considering the considerable distance from the closest receptor, the project is unlikely to have any impact on the SKA.
Terrestrial Biodiversity Theme	Very High	Terrestrial Biodiversity Impact Assessment	A terrestrial Biodiversity Impact Assessment was undertaken and is attached in Annexure E1.

The table below reflects the specialist studies recommended in the DFFE Screening tool and whether they have been included in the Draft EIR.

Table 7: Specialist Studies recommended in the DEA Screening Tool.

Study Recommended	Discussion
Agricultural Impact Assessment	Annexure E3
Landscape/Visual Impact Assessment	Annexure E5

Study Recommended	Discussion
Archaeological and Cultural Heritage Impact Assessment	Annexure E4
Palaeontology Impact Assessment	Annexure E4
Terrestrial Biodiversity Impact Assessment	Annexure E1
Aquatic Biodiversity Impact Assessment	Annexure E1
Avian Impact Assessment	Annexure E2
Civil Aviation Assessment	Not undertaken - The South Avian Civil Aviation Authority have been approached to provide input in this regard. The applicant has submitted an obstacle application (Part 30-27) to the South African Civil Aviation Authority.
Defense Assessment	Not undertaken – the Department of Defence has been approached to provide input in this regard.
RFI Assessment	Not undertaken – The South African Square Kilometre Array (SA SKA) have been approached to provide comment in this regard. As outlined in the table above, the project is unlikely to have any impact on the SKA, due to the considerable distance from the closest receptor.
Geotechnical Assessment	Annexure E10
Socio-Economic Assessment	Annexure E6
Plant Species Assessment	Annexure E1
Animal Species Assessment	Annexure E2

3.2 PROVINCIAL LEGISLATION

This section deals with provincially promulgated or provincially applicable legislation associated with the proposed Themeda PV¹³.

3.2.1 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

¹³ The legislative context outlined in this section was undertaken with input from the Social and Ecological Specialist.

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.
- 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).

3.2.2 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/m². 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, the 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.

3.2.3 Northwest Biodiversity Sector Plan.

The North West Biodiversity Sector Plan (2015) is a forward planning tool designed to assist government and society to better consider and incorporate a wide range of environmental considerations into development planning and execution.

It Integrates the best available knowledge on the environment and biodiversity in the province to identify a province-wide network of Critical Biodiversity Areas and Ecological Support Areas for land and water

It furthermore provides land use management recommendations that define the minimum spatial and management requirements for a sustainable environment in the province

The Themeda PV overlaps with a terrestrial CBA 2 area and aquatic ESA 1 and ESA 2. According to the BSP the terrestrial CBA 2 and aquatic ESA 1 designations for the area refers to a corridor and dolomite recharge areas respectively.

The significance of the project on these features have been assessed in the Terrestrial and Freshwater Biodiversity Assessments. Please refer to Annexure E1.

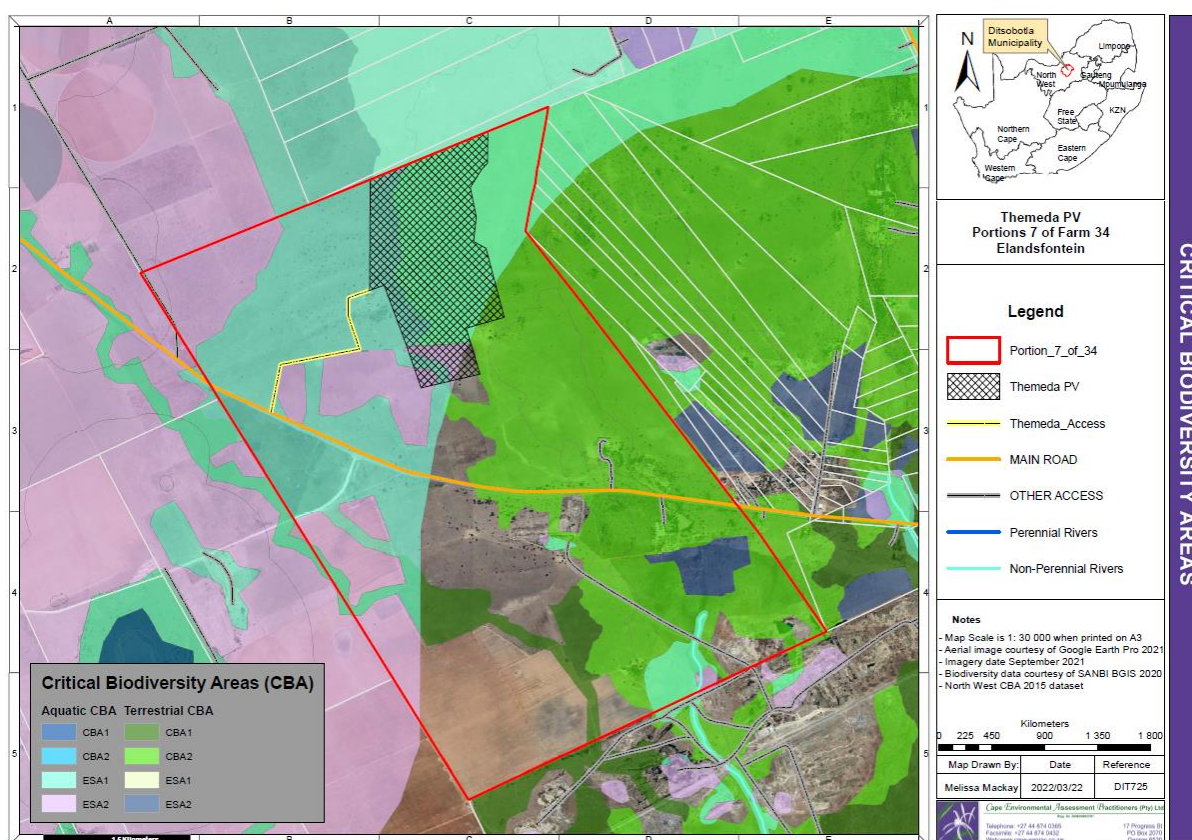


Figure 28: Extract of Northwest Biodiversity Sector Plan.

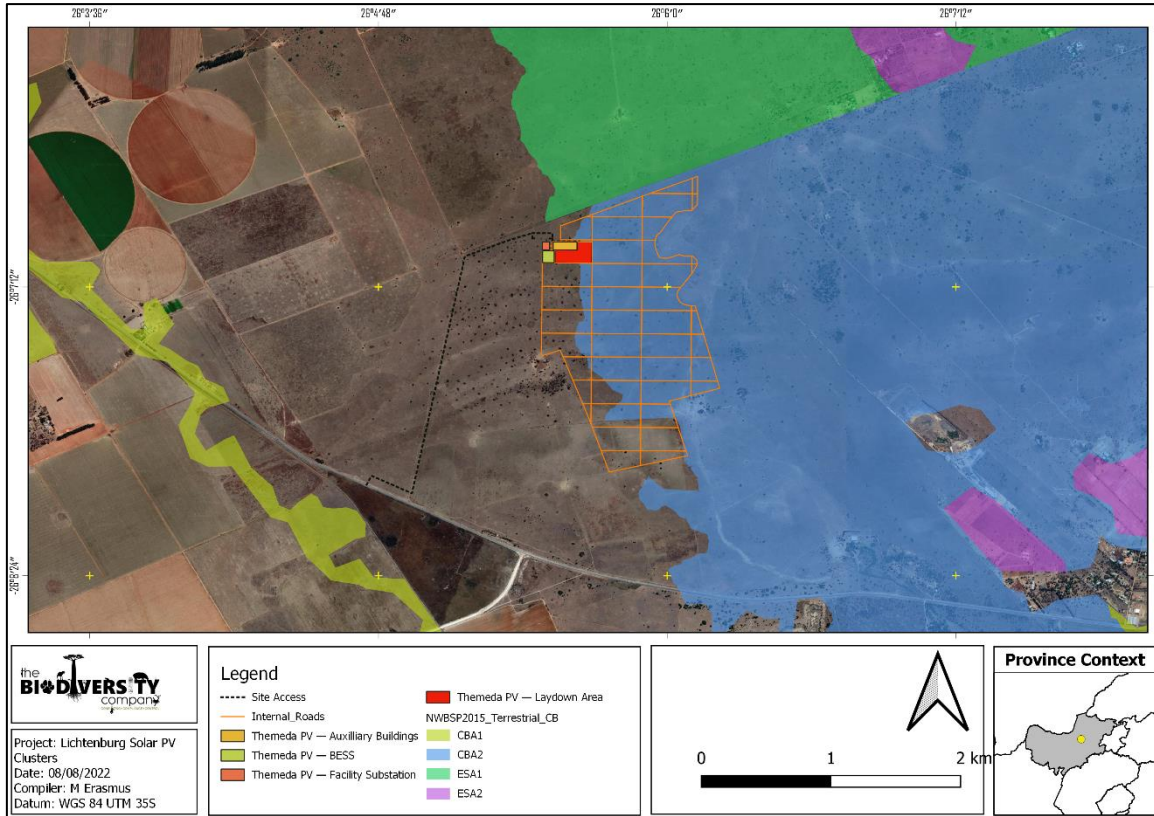


Figure 29: Map illustrating the Terrestrial CBA's in relation to the proposed project (The Biodiversity Company, 2022).

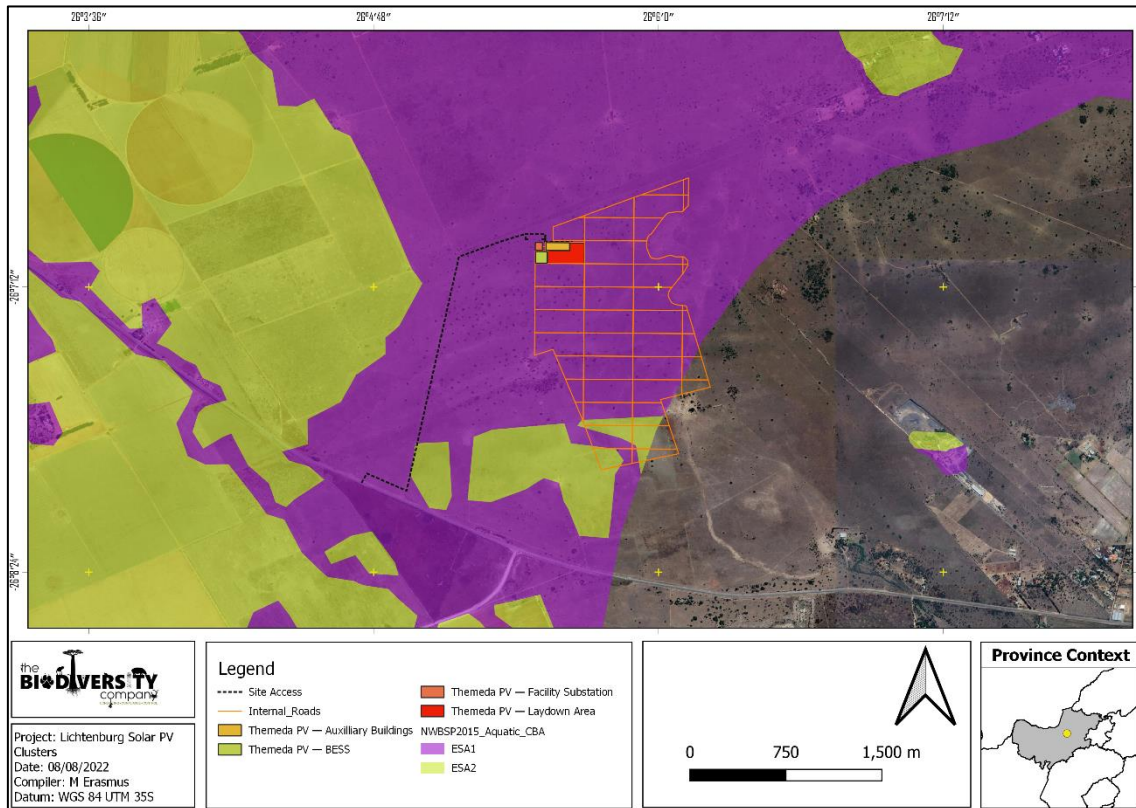


Figure 30: Map illustrating the Aquatic ESA's in relation to the Study Area (The Biodiversity Company 2022).

The Terrestrial Biodiversity Specialist confirmed that the development footprint occurs within a CBA2 which extends ~ 4600 ha. The underlying reasons for the site being a CBA2 is due to it being an ecological corridor (CBA_T8: CRITICAL CORRIDOR linkages). Given that the infrastructure is situated on the edge of the CBA2 and will result in the loss of ~3% of the corridor in the project boundary, the functioning of the corridor will not be significantly impacted by project infrastructure and the processes and conservation of these features may continue.

3.3 GUIDELINES, POLICIES AND AUTHORITATIVE REPORTS

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

3.3.1 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.

3.3.2 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.

3.3.3 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 8: 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
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.

3.3.4 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.*¹⁴

¹⁴ See definition of “sustainable development” in section 1 of NEMA.

It is believed that the proposed 120MW Themeda 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.

3.3.5 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.

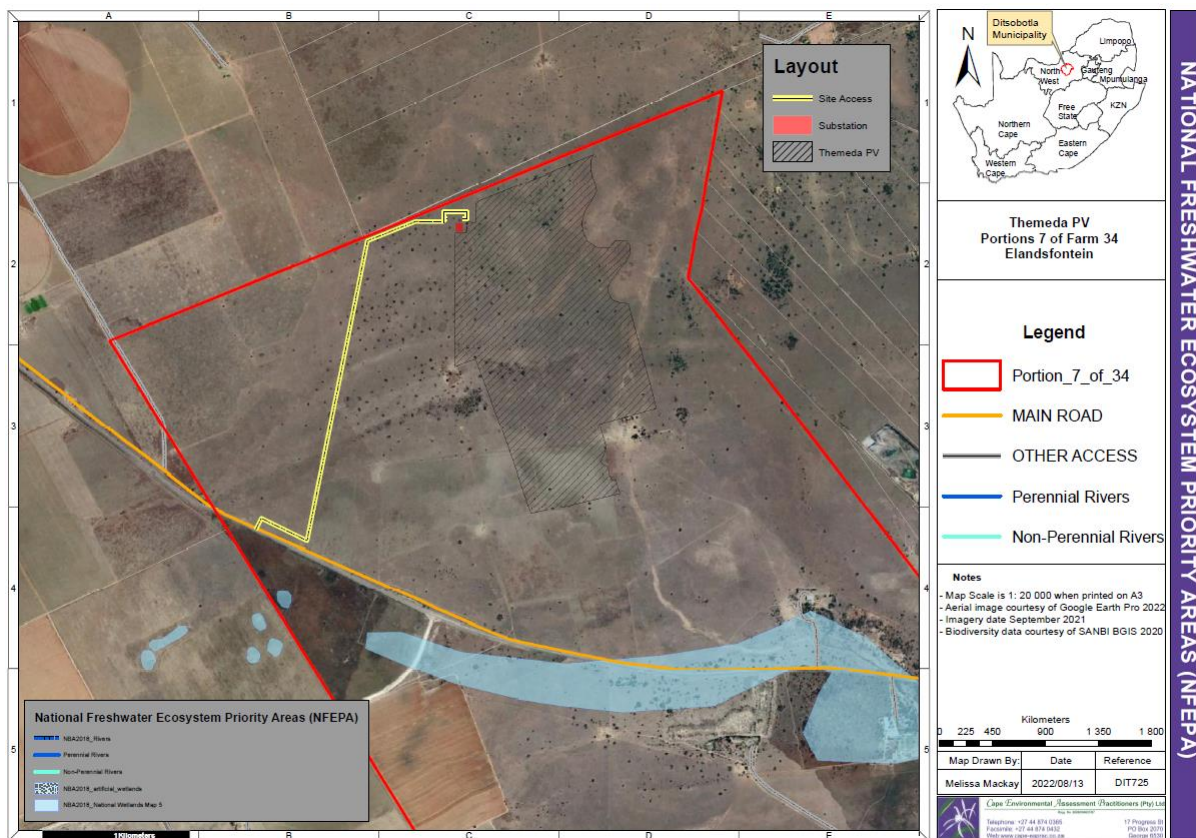


Figure 31: NFEPA Priority Areas in relation to Themeda PV.

4. SITE DESCRIPTION AND ATTRIBUTES

The following sections provide a description of the Natural, Historical Social and Built Environmental context of Portion 7 of Farm Elandsfontein 34, with particular focus on the site location for the proposed Themeda PV. This section of the 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.

4.1 LOCATION & BUILT ENVIRONMENT

The target property (Portion 7 of Farm Elandsfontein 34), is located in the Ngaka Modiri Molema District Municipality of the North West Province, within the jurisdiction area of the Ditsobotla Local Municipality. The property size is 1916.9001 ha.

The proposed Themeda PV is accessed and is situated directly west of the R503 between Lichtenburg and Mahikeng. Please refer to the location and topographical plans attached in Appendix A of this DSR.



Figure 32: Location of Portion 7 of the Farm Elandsfontein 34.

According to the heritage specialist (see Annexure E4) the only formal structures within the study site are the two existing powerlines that traverse the property.



Figure 33: Existing powerlines traversing the study area.(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.

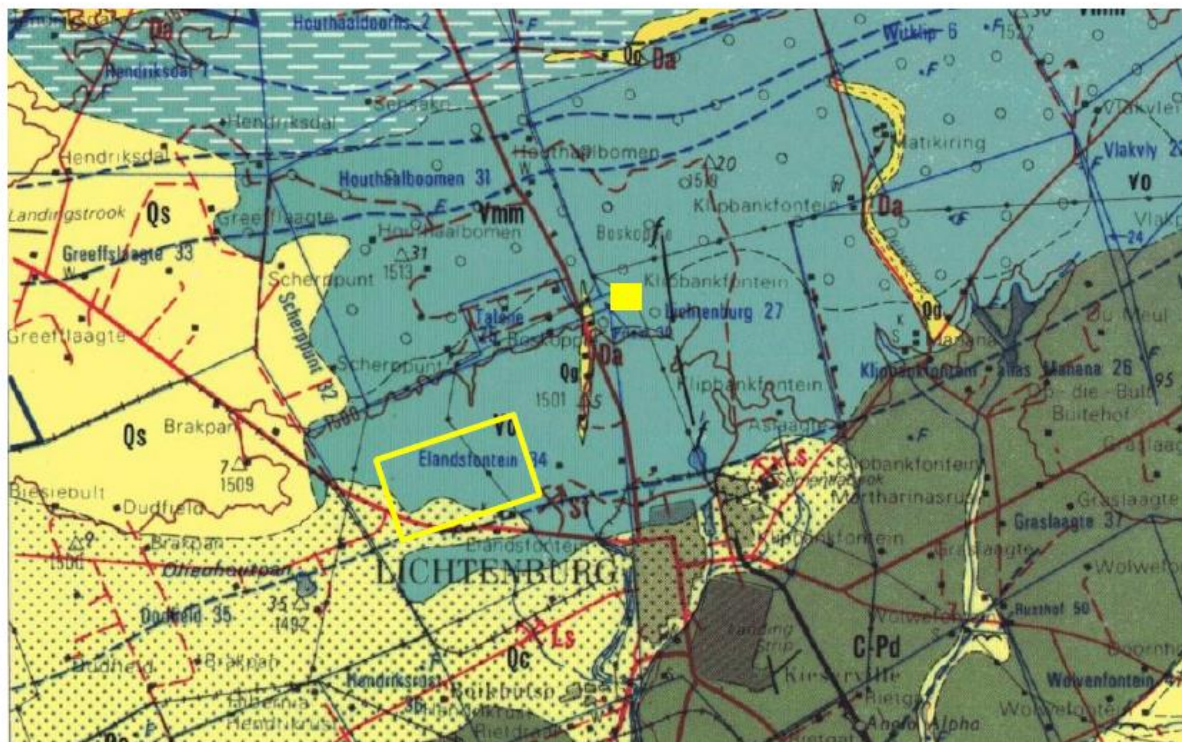


Figure 34: Geological map of the area around Themeda PV and Lichtenburg (Bamford, 2022)

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

According to the 1:250 000 geological map (2626 West Rand), the area is mainly underlain by dark coloured dolomites belonging to the Oaktree Formation, Malmani Subgroup, Chuniespoort Group of the Transvaal Supergroup and a small portion of tertiary calcrete.

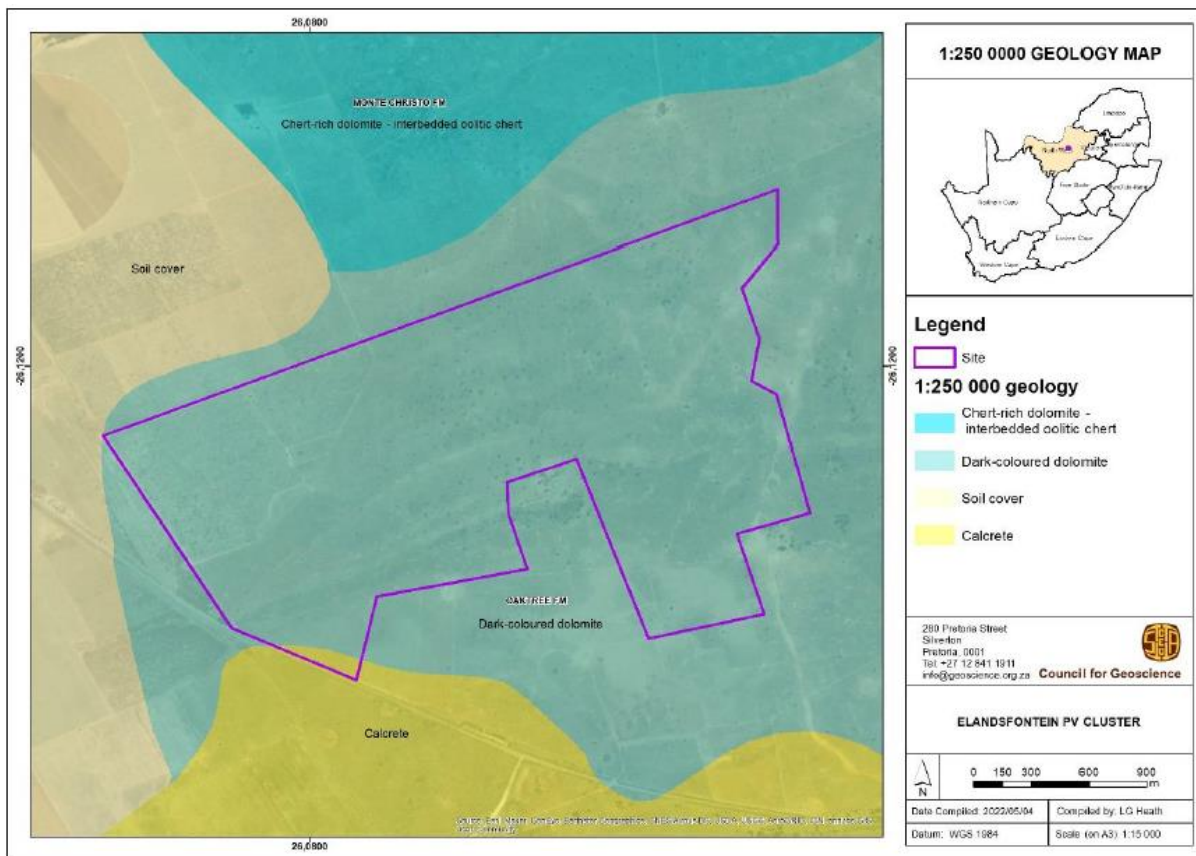


Figure 35: 1:50 000 Geological Map (Council for Geoscience, 2022)

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.

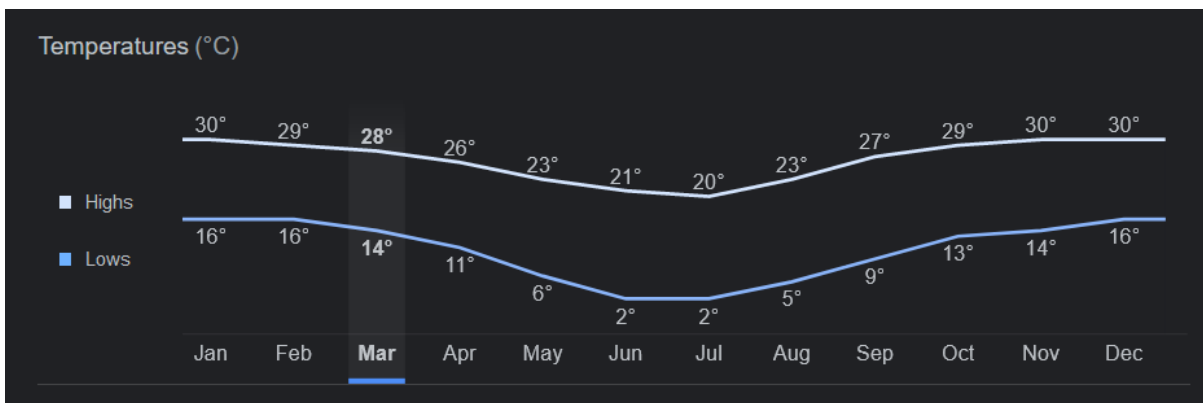


Figure 36: Average monthly temperatures in the Lichtenburg area.

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

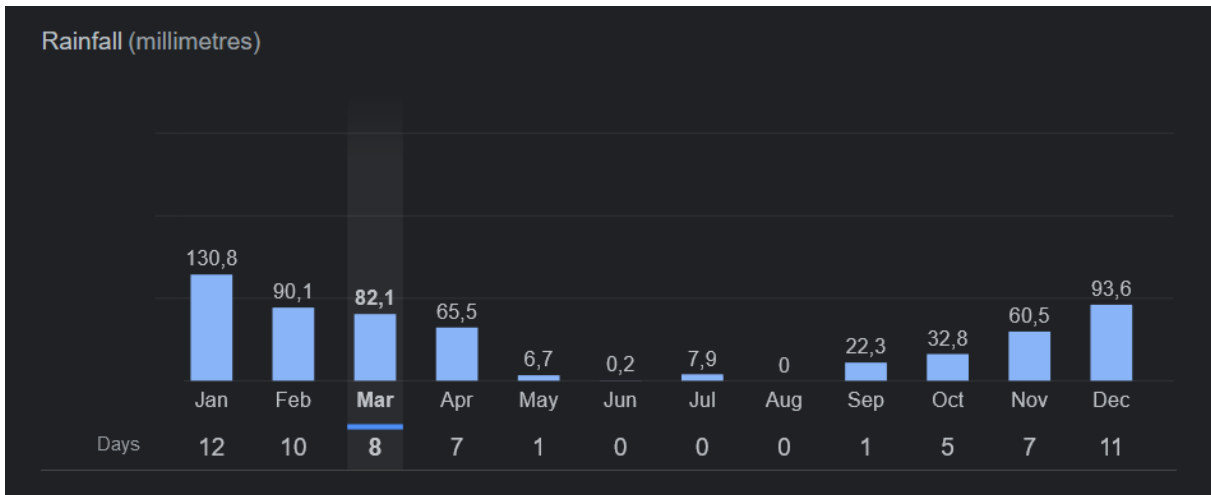


Figure 37: Average Monthly Rainfall in the Lichtenburg area.

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.

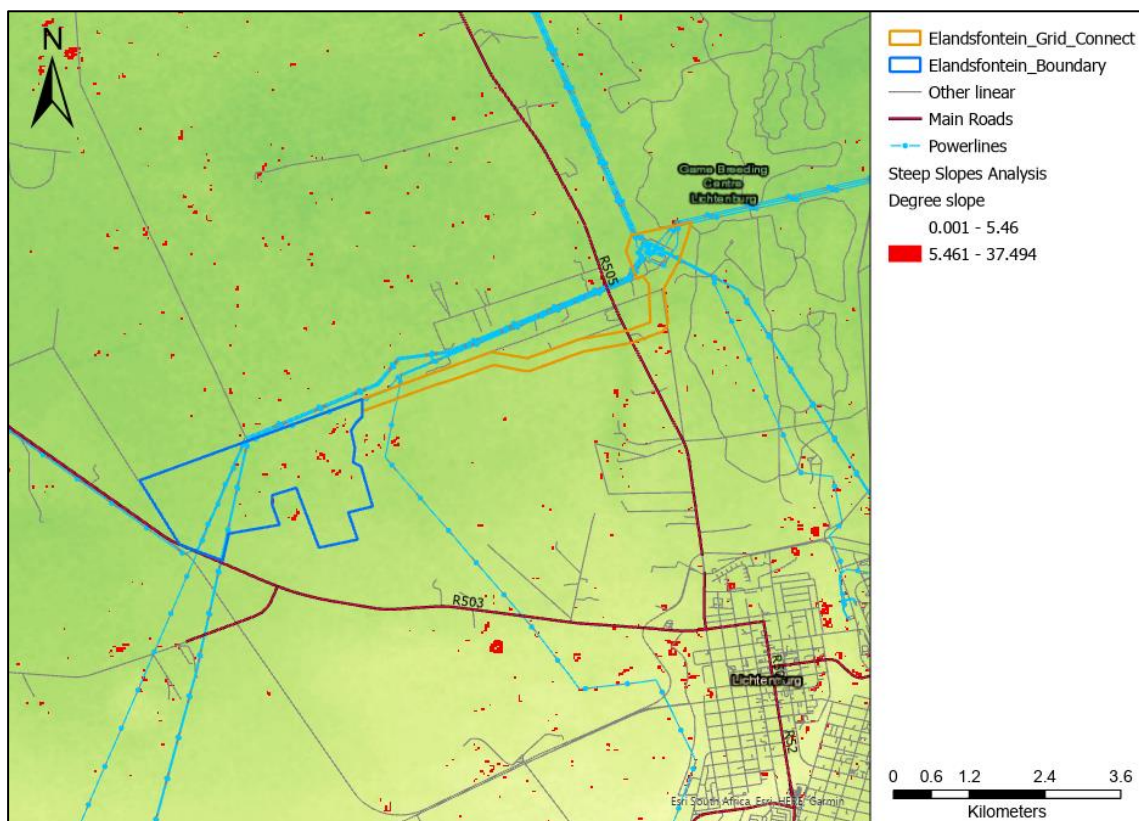


Figure 38. Slope analysis of the Study site and Proposed Grid Connection¹⁵ (Stead, 2022)

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

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

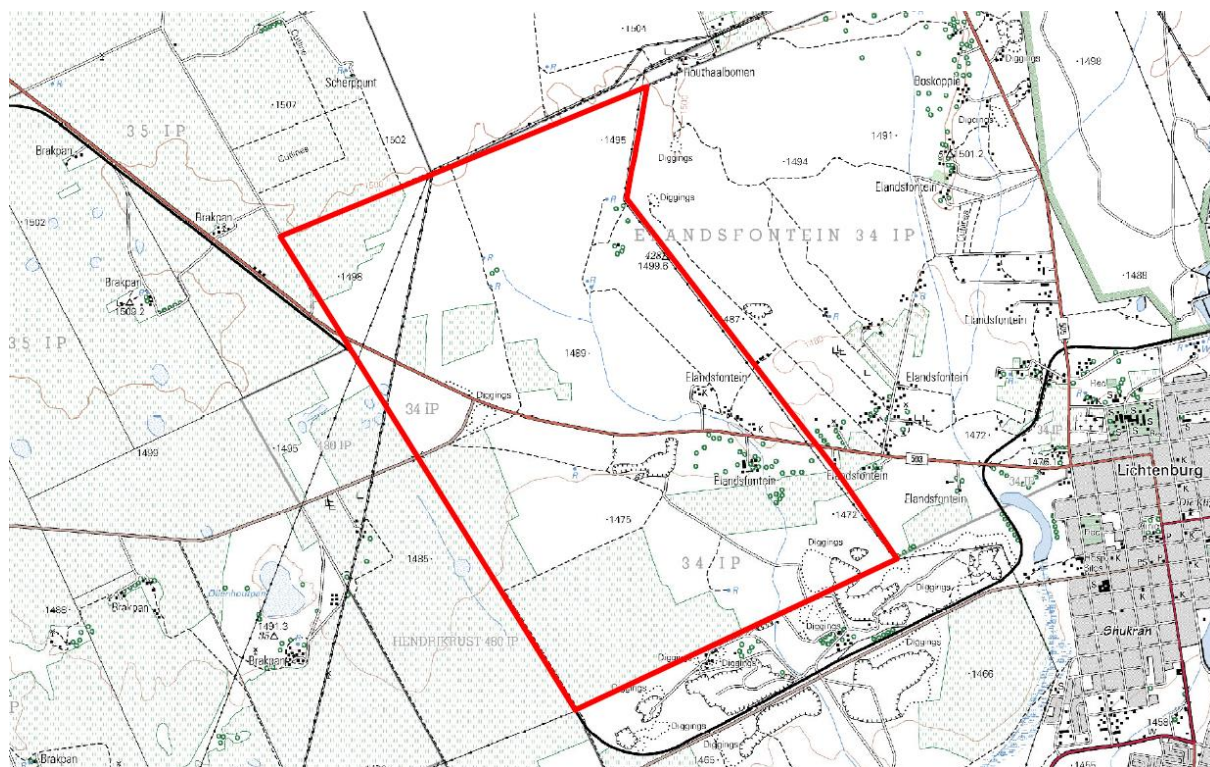


Figure 39: Extract of 1:50 000 Topographical Map of the study site.

4.5 BOTANICAL COMPOSITION OF THE STUDY SITE

The Biodiversity Company (various authors, 2022) undertook an Aquatic and Terrestrial Biodiversity Assessment for the proposed Themeda 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.

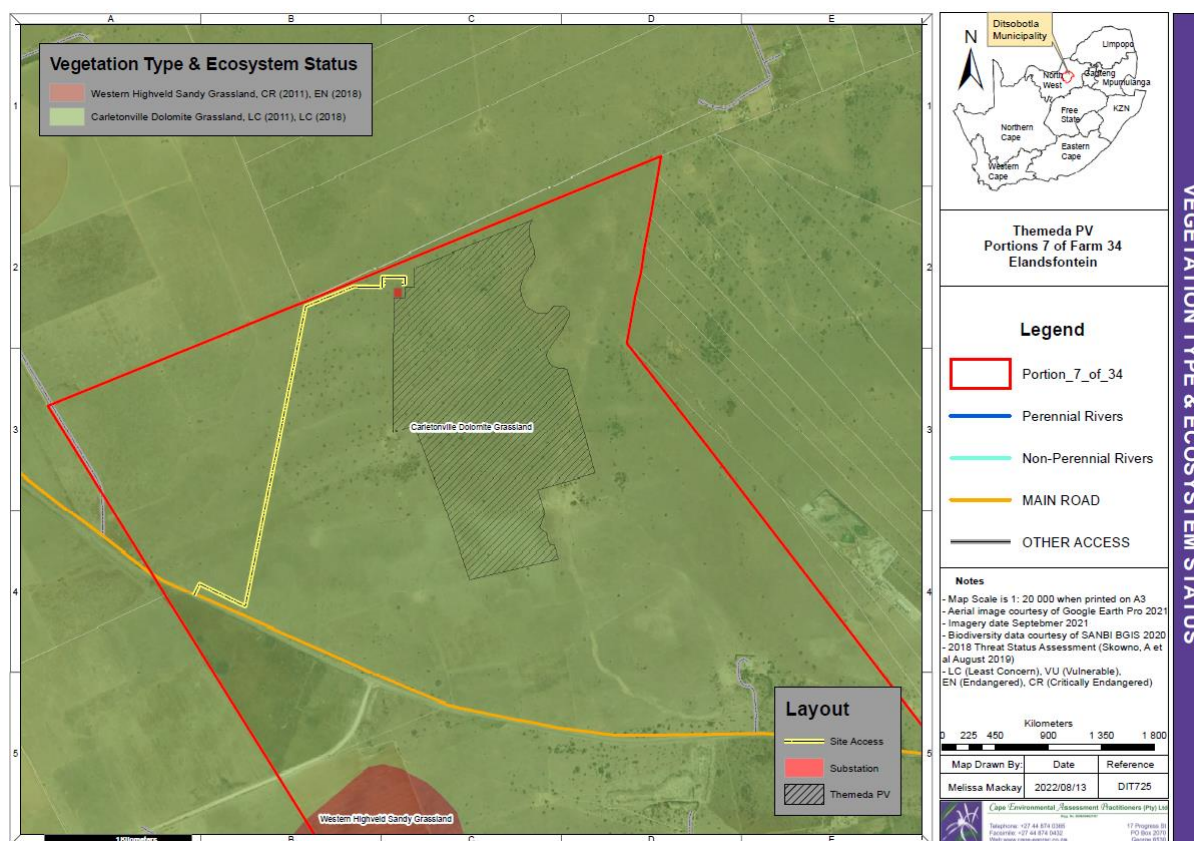


Figure 40: Map illustrating the vegetation type associated with Themeda PV.

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 282 species of indigenous plants are expected to occur within or in close proximity to 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 Biodiversity Impact Assessment for the proposed Themeda 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 9: 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 Biodiversity Impact Assessment for the proposed Themeda 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 Delineated Aquatic Features.

The wetland areas were delineated in accordance with the DWAF (2005) guidelines. Four Hydrogeomorphic units were identified within the 500 m regulated area, which have been classified as depressions, as well as an unchanneled valley bottom wetland. Of these wetland systems, only units 1, 2 and 3 are expected to be at an appreciable level of risk due to the locality of these systems being

within close proximity to the proposed PV area. Unit 6 is located adjacent the proposed PV area close to the access road, where the R503 Road and its associated stormwater infrastructure separates this system.

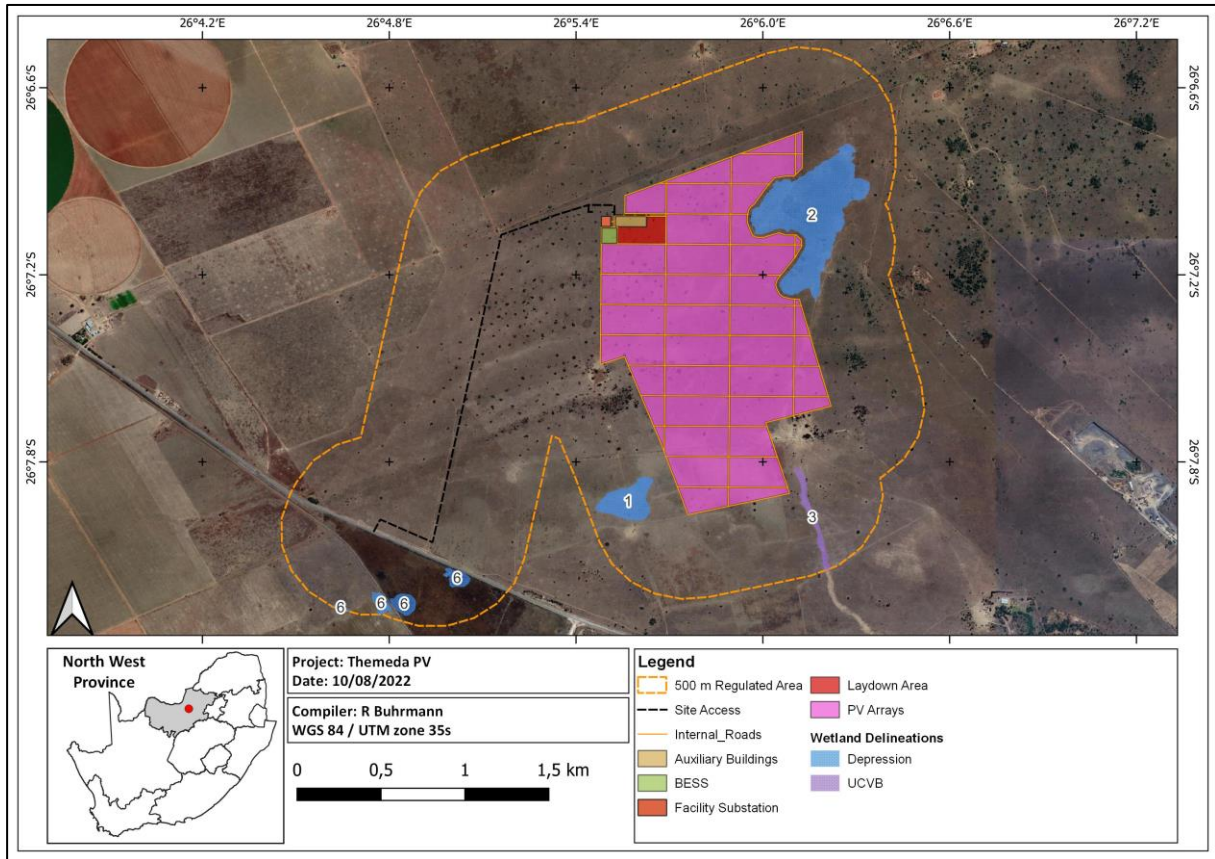


Figure 41: Delineated aquatic features within the 500 m regulated area (The Biodiversity Company, 2022).

The “Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries” (Macfarlane et al., 2014) was used to determine the appropriate buffer zone for the proposed activity. A pre-mitigation buffer zone of 30 m is recommended for the identified wetland, which can likely be decreased to 20 m if suitable avoidance and mitigation measures are implemented.

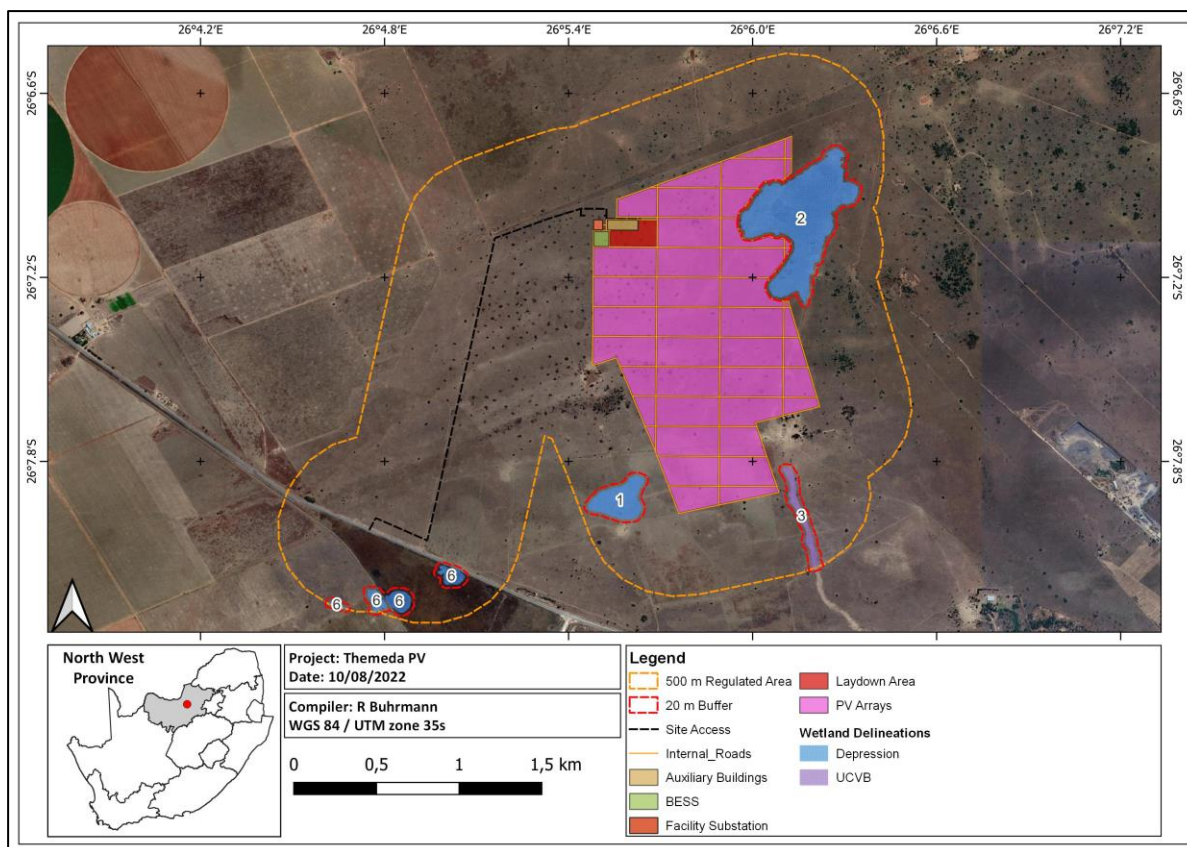


Figure 42: Recommended Aquatic buffers (The Biodiversity Company, 2022)

It must be noted that the aquatic features and buffers recommended by the aquatic specialist have all been avoided by the preferred layout alternative (Layout Alternative 2).

4.7.2 Hydrological Setting

The project area overlaps the C31A quaternary catchment. The C31A-01176 SQR spans 14.97 km of the unnamed tributary of the Harts River, with the nearest watercourse more than 5 km from the project area.

4.7.3 Present Ecological Status

The PES category of the reach is classed as Seriously modified (class E). 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.

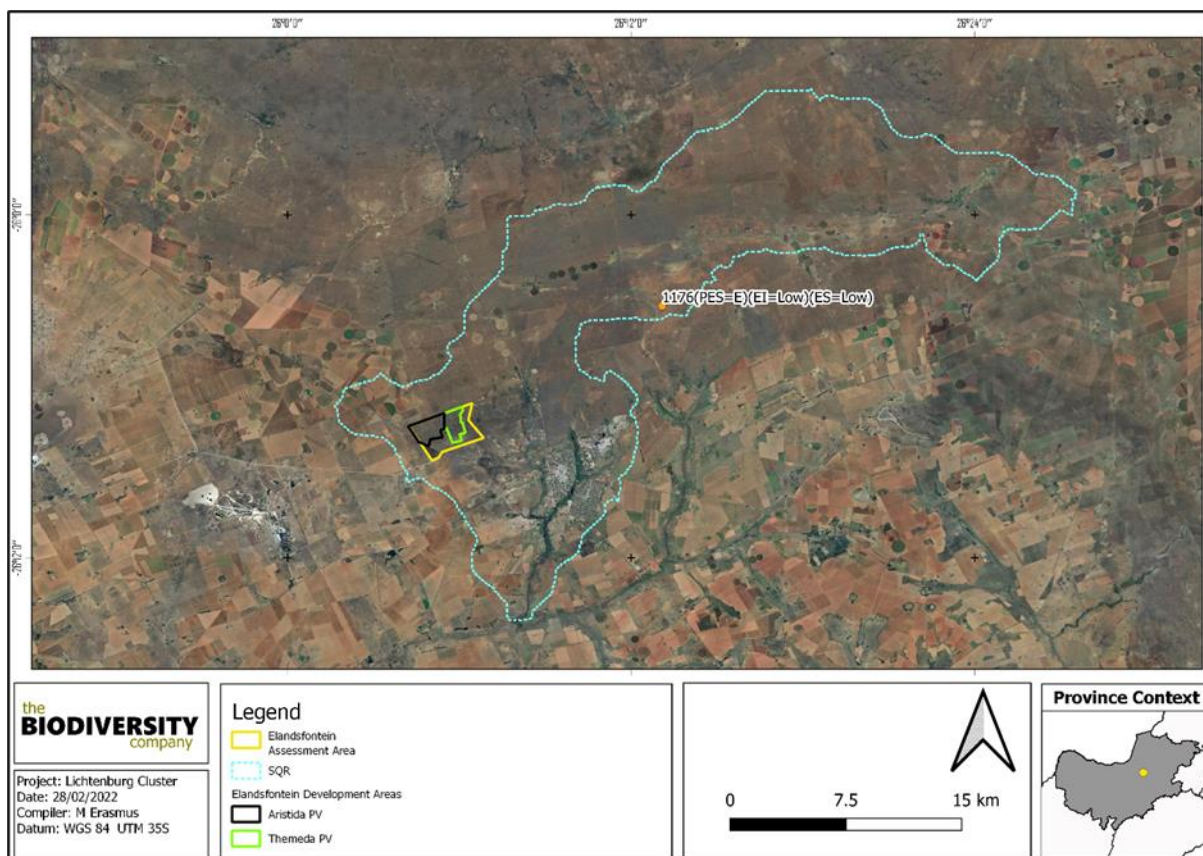


Figure 43: Location of the study site in relation to the Sub-Quaternary Reach (The Biodiversity Company, 2022)

Table 10: Summary of the Present Ecological State of the C31A-01176 Sub-Quaternary Reach (The Biodiversity Company, 2022)

Component/Catchment	C31A-01176
Present Ecological Status	Seriously Modified (class E)
Ecological Importance Class	Low
Ecological Sensitivity	Low
Default Ecological Category	Largely Modified (class D)

4.8 AVIFAUNAL COMPOSITION OF THE STUDY SITE

Pachnoda Consulting (Lucas Niemand, 2022) undertook an Avifaunal Impact Assessment for the proposed Themeda 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.

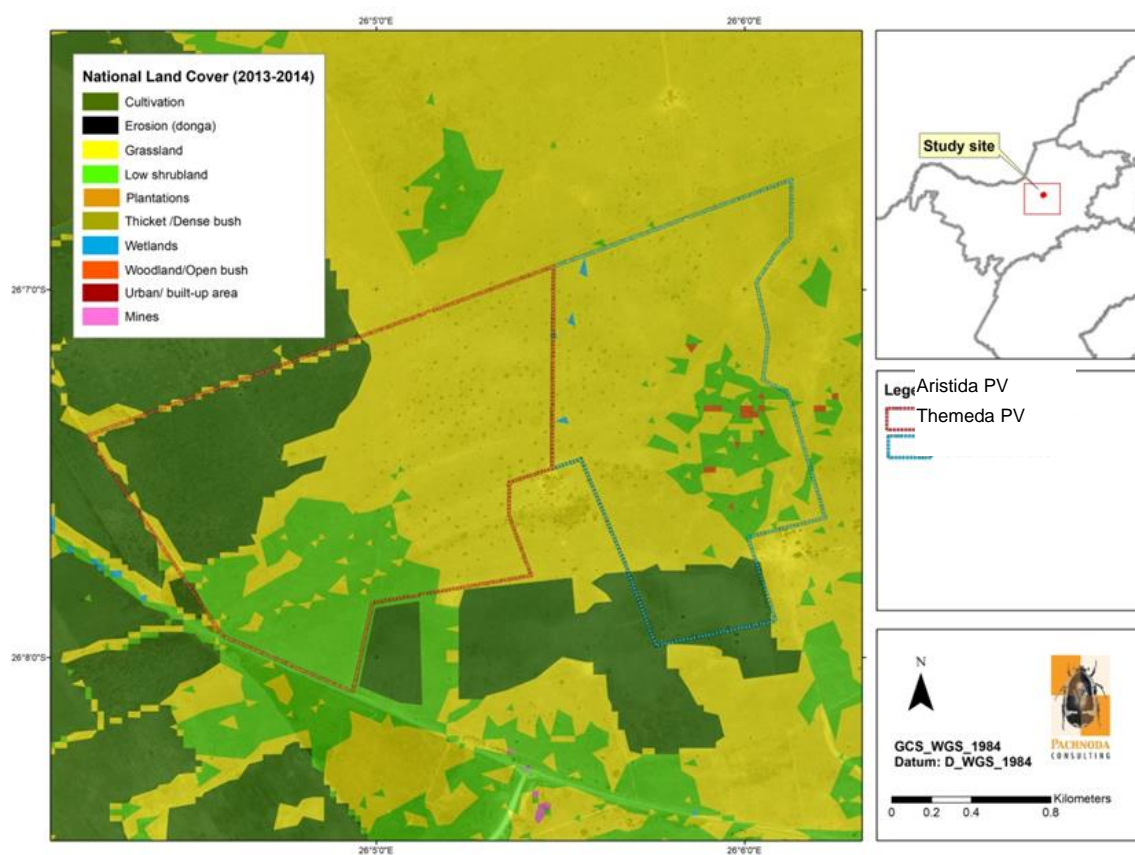


Figure 44: Land cover classes of the study site (Pachnoda,2022).

4.8.2 Conservation Areas, Protected Areas and Important Bird Areas

The study site is located 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.

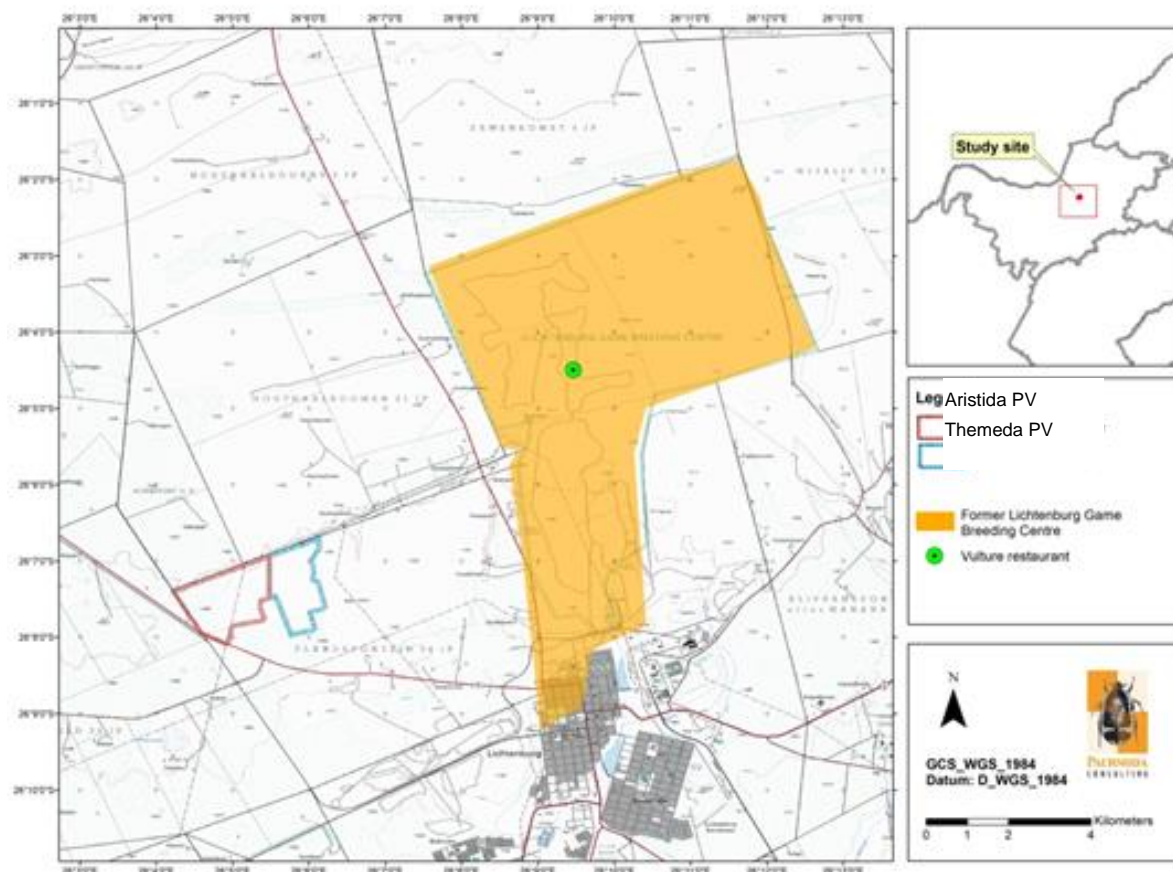


Figure 45: A map illustrating the locality of conservation areas in close proximity to the proposed study site (Pachnoda, 2022).

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 dense grassland,
- Mixed woodland on dolomite outcrops,
- Secondary Grassland and Pastures.

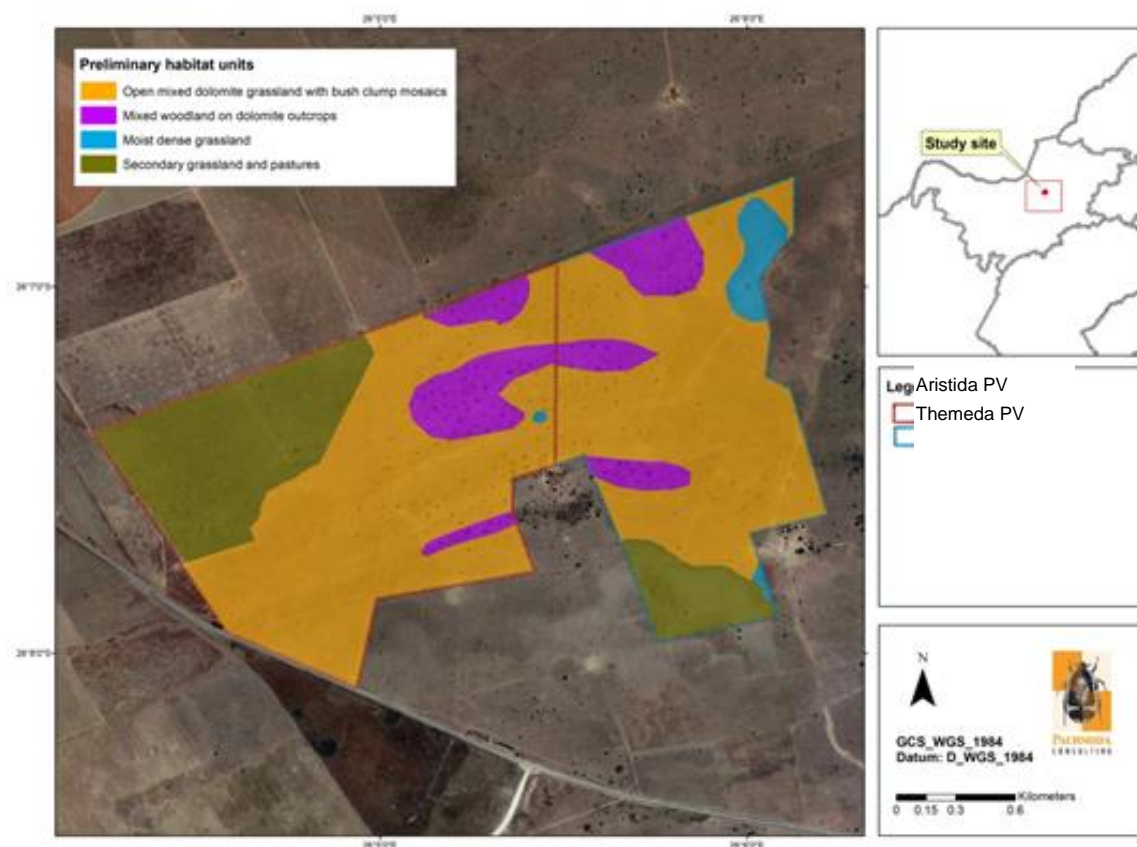


Figure 46: A preliminary habitat map illustrating the avifaunal habitat types on the study site (Pachnoda, 2022).

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 11: 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 12: 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 13: 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> (White-backed Vulture)	Critically Endangered	Critically Endangered	Breed on tall, flat-topped trees. Mainly restricted to large rural or game farming areas.	A regular foraging/scavenging visitor to 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.

Species	Global Conservation Status*	National Conservation Status**	Preferred Habitat	Potential Likelihood of Occurrence
<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 Impact Assessment for the proposed Themeda PV (Annexure E3). The following has been summarised from this report.

4.9.1 Land type classification

Two land types are present within the Themeda PV development area namely:

- Land Type Fa11 and
- Land Type Fb4.

These land types are discussed in further detail below.

Approximately 75% of the area consists of Land Fa11, located in the upper part of the development area while the bottom part consists of Land Type Fb4. The areas west, north and east of the development area consists of Land Type Fa11, while the area south of it, consists of Land Type Fb4.

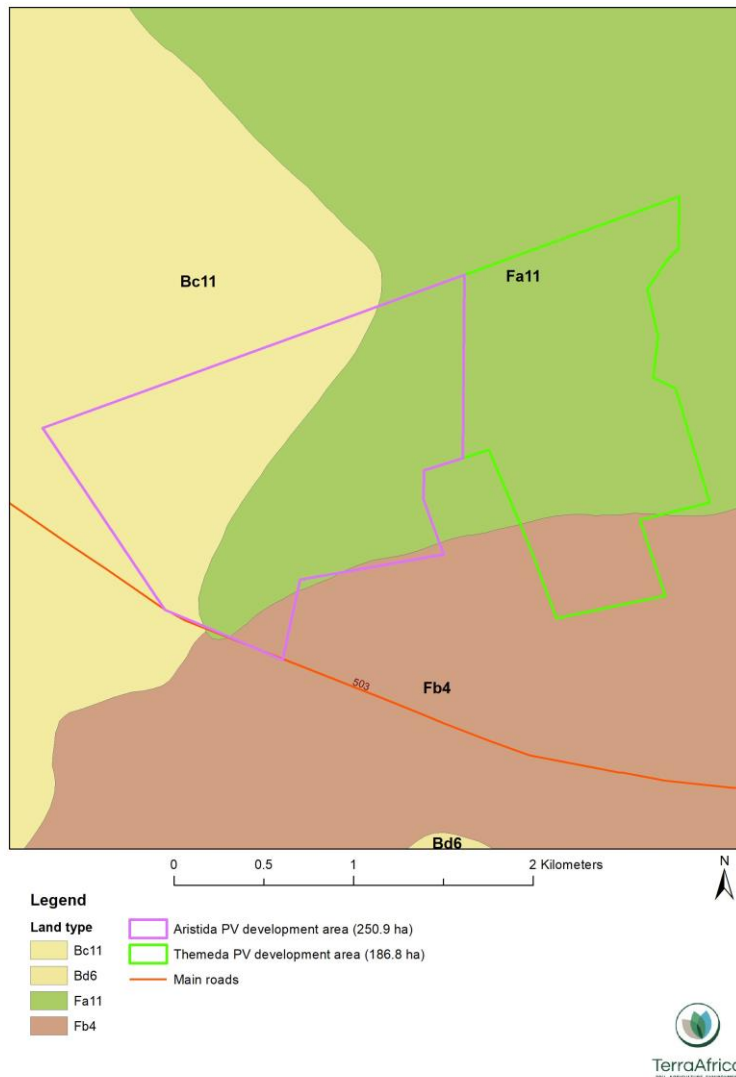


Table 14: Land type map showing the proposed Themeda PV (green polygon) as well as the other PV facility proposed within the study area. (TerraAfrica, 2022)

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%.

4.9.1.2 Land Type FB4

In comparison to Land Type Fa11, Land Type Bc11 consists only of two different terrain. Of the entire land type area, 95% consists of flat toe-slopes (with slope between 0 and 2%) with slope length between 1300 and 1700m. These areas consist predominantly of Westleigh, Hutton, Avalon, Glencoe and Bainsvlei soil forms. The remaining 5% of the land type area consists of valley bottoms (Terrain unit 5). The valley bottoms have about 60% soils of the Sterkspruit form and 40% soils of the Rensburg form. The slope length of the valley bottoms are short (between 50 and 100m) and slope ranges between 0 and 1%.

4.9.2 Land capability

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

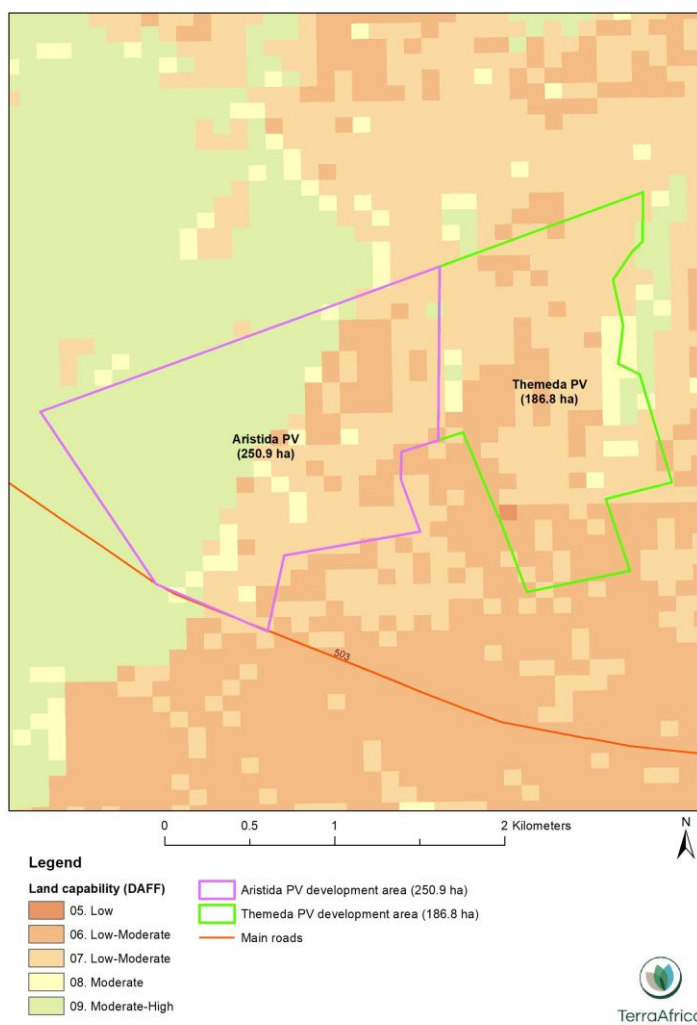


Figure 47: Land capability map of the proposed Elandsfontein Cluster. The Themeda PV facility is depicted by the green polygon (TerraAfrica, 2022)

Almost the entire Themeda PV development area consists of land with Low-Moderate (Classes 06 and 07) land capability. Two narrow sections along the western and eastern boundaries of the development area consist of land with higher land capability i.e. Moderate (Class 08) and Moderate-High (Class 09) land capability. One very small area along the western boundary consists of Low (Class 05) land capability.

4.9.3 Agricultural production

According to the Crop Estimates Consortium (2019), the Themeda PV development area has one area where field crop boundaries are present. This area is located in the most southern corner of the development area and consists of either rainfed annual crops or planted pastures. A small area of crops located directly south of this area, outside the development area's boundaries, consists of similar fields. More crop fields with either rainfed annual crops or planted pastures, are located further south and west of the development area. Centre pivot irrigation areas are located 2.5 km north west and further away to the north west of the development area.

Even though the field crop boundary data indicate the presence of a crop field in the most southern corner of the development area, the analysis of aerial imagery available on Google Earth has shown that while the area has not been cultivated from 2008 and onwards as it was left to revert back to grazing land with the soil left fallow to allow the natural vegetation of the area to re-establish itself. It is likely that cultivation of this area was stopped earlier than 2008 but aerial imagery is not available to confirm it. This information will be verified through discussion with the landowner during the EIA phase. Currently, the land use of the entire Themeda PV development area is extensive livestock farming.

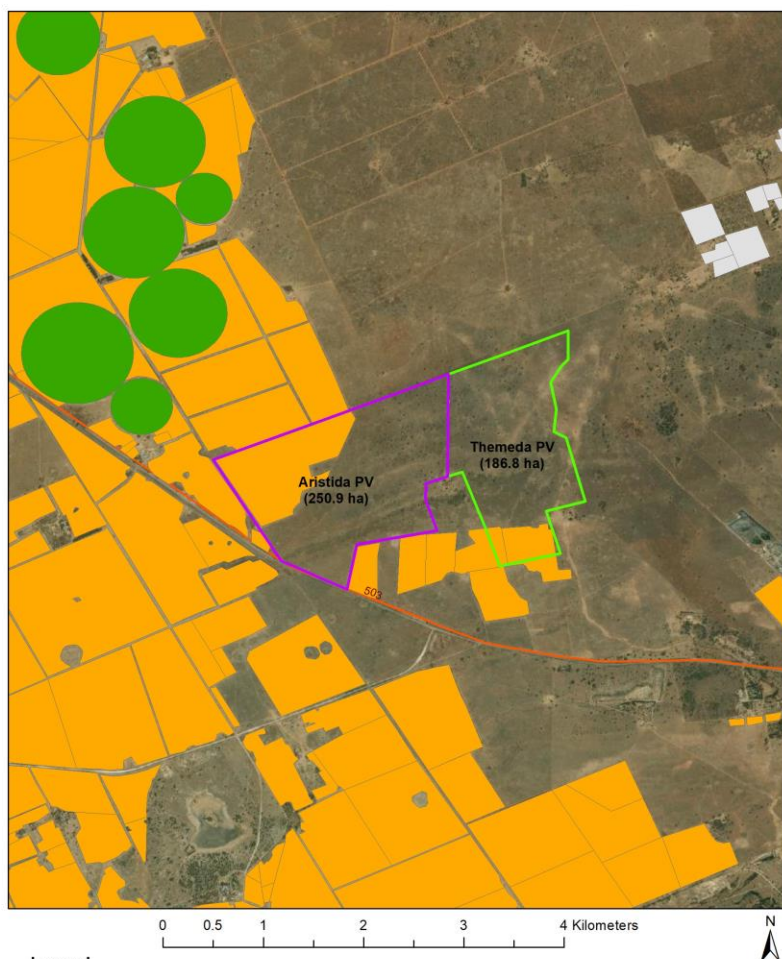


Figure 48: Field crop boundaries of the Study Site (Themeda PV is Depicted by the red polygon) (TerraAfrica, 2022)

Legend

Field crops

Green Pivot Irrigation

Orange Rainfed Annual Crop Cultivation / Planted Pastures

Grey Small Holdings

Purple Aristida PV development area (250.9 ha)

Red Themeda PV development area (186.8 ha)

Orange Main roads



4.9.4 High Potential Agricultural Areas

To determine whether the proposed development of the three PV facilities within the Elandsfontein 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.

The Themeda PV development area doesn't border on any HPAAs. 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 HPAAs, 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 Impact Assessment for the proposed Themeda 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

According to the screening tool the heritage sensitivity of the study area is low. During the survey heritage resources were limited to low-density background scatters of MSA & LSA lithics. Scatters (between 3 - 5 artefacts per m²) were recorded as observation points of low significance. Scatters with densities less than 2 artefacts per m² 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.

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,

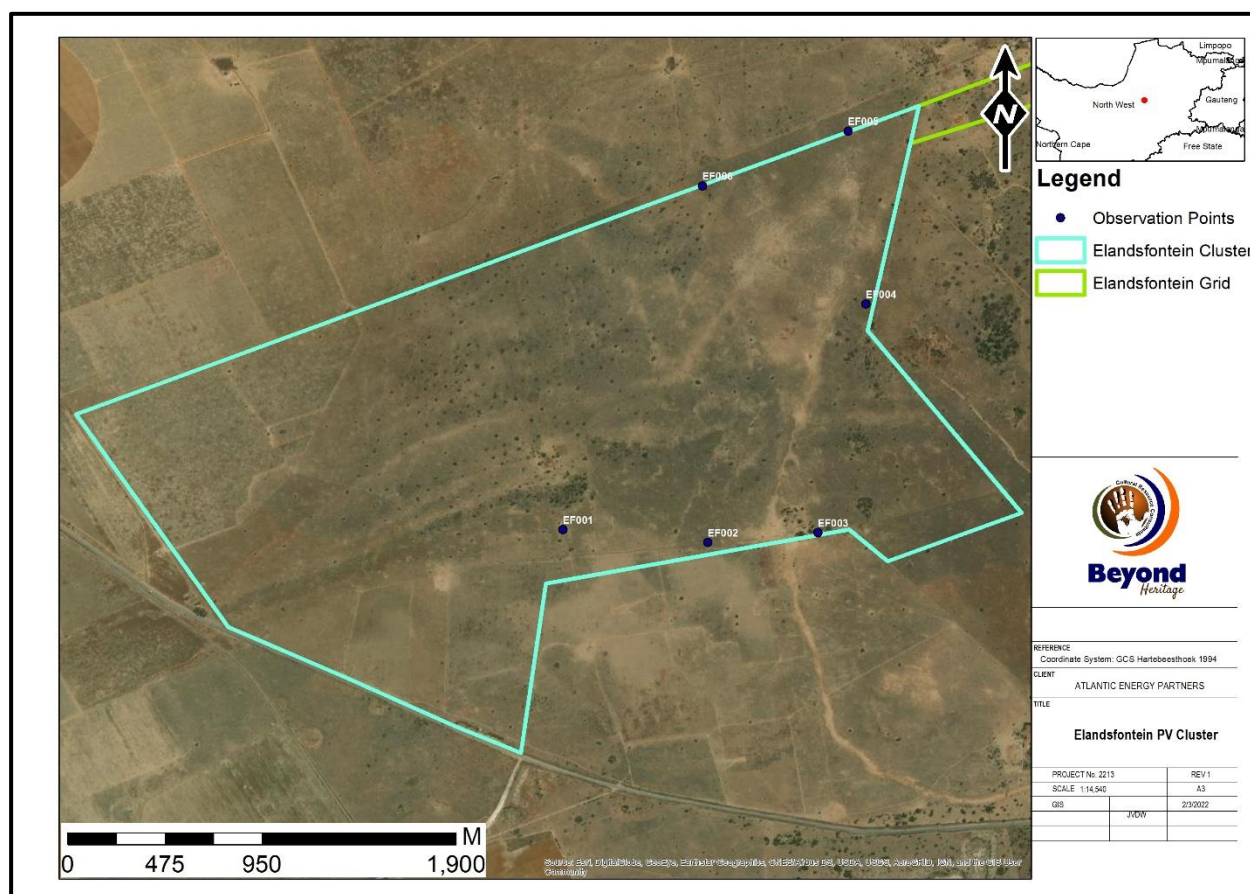


Figure 49: Recorded features within the study site (Van der Walt, 2022)

Table 15. Recorded observations in the study area (Van der Walt, 2022)

Label	Longitude	Latitude	Description	Significance	Elevation
EF001	26° 05' 30.7823" E	26° 07' 42.2581" S	Small scatter of MSA lithics located on a small gravel road running from the entrance of the farm to the cement water reservoir.	Low Significance GP C	1502,568
EF002	26° 05' 53.7611" E	26° 07' 44.2955" S	Small scatter of MSA flakes and chunks in a small gravel road where the top soil has been scraped away.	Low Significance GP C	1504,565
EF003	26° 06' 11.1852" E	26° 07' 42.7080" S	Small scatter of lithic artefacts found in a gravel road on a rocky outcrop.	Low Significance GP C	1494,04
EF004	26° 06' 18.7884" E	26° 07' 06.5280" S	Small scatter of artefacts located on a small gravel road on a rocky outcrop.	Low Significance GP C	1498,397
EF005	26° 06' 15.9839" E	26° 06' 39.1573" S	Small scatter of artefacts located near a gravel road.	Low Significance GP C	1498,78
EF006	26° 05' 52.8972" E	26° 06' 47.8368" S	Isolated MSA blade located near a small gravel road.	Low Significance GP C	1500,441

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 Impact Assessment attached 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 EMP. 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 Visual Impact Assessment for the proposed Themeda PV, which included the visual context of the study site (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. 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 50. 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.

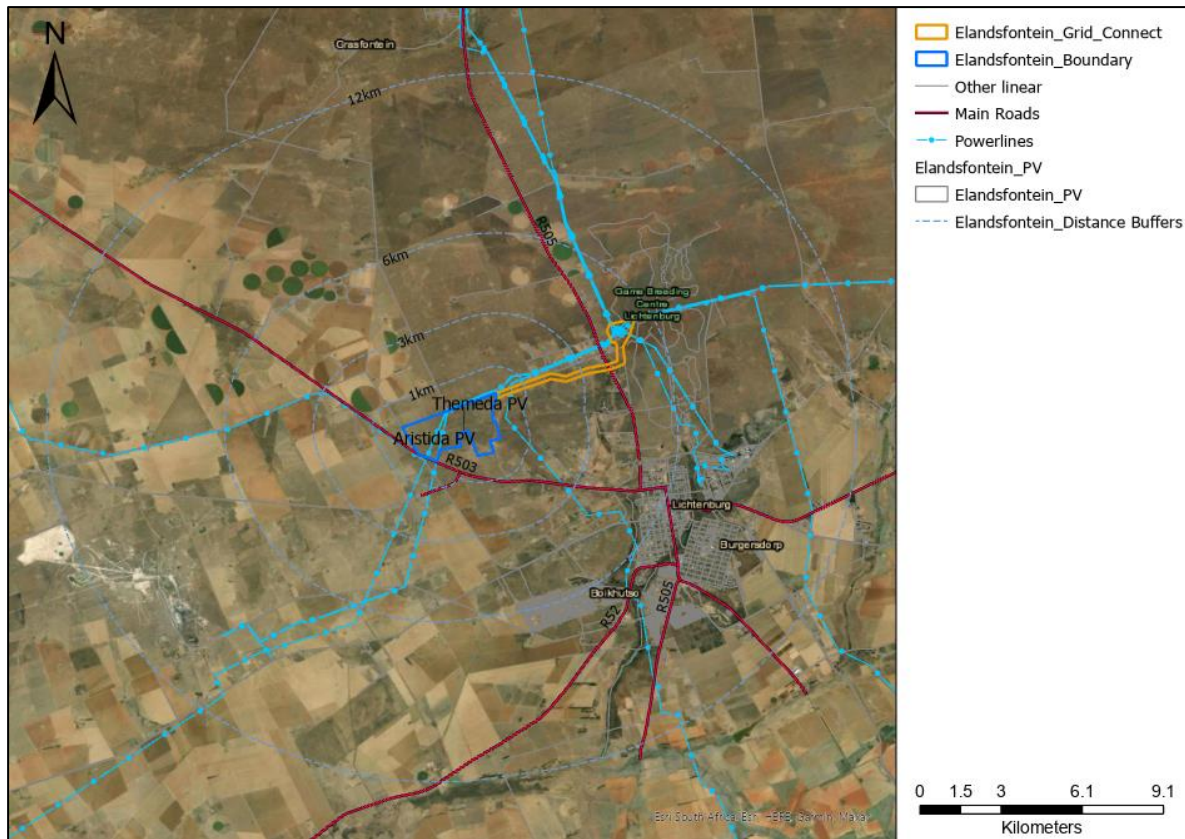


Figure 51: Land use map depicting Open-Street spatial data overlay onto ESRI satellite imagery (Stead, 2022)

4.11.3 Conservation

The only protected conservation area in the region was 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.



Figure 52. Photograph from the study area of the grasslands and scattered small to medium sized trees (Stead, 2022)

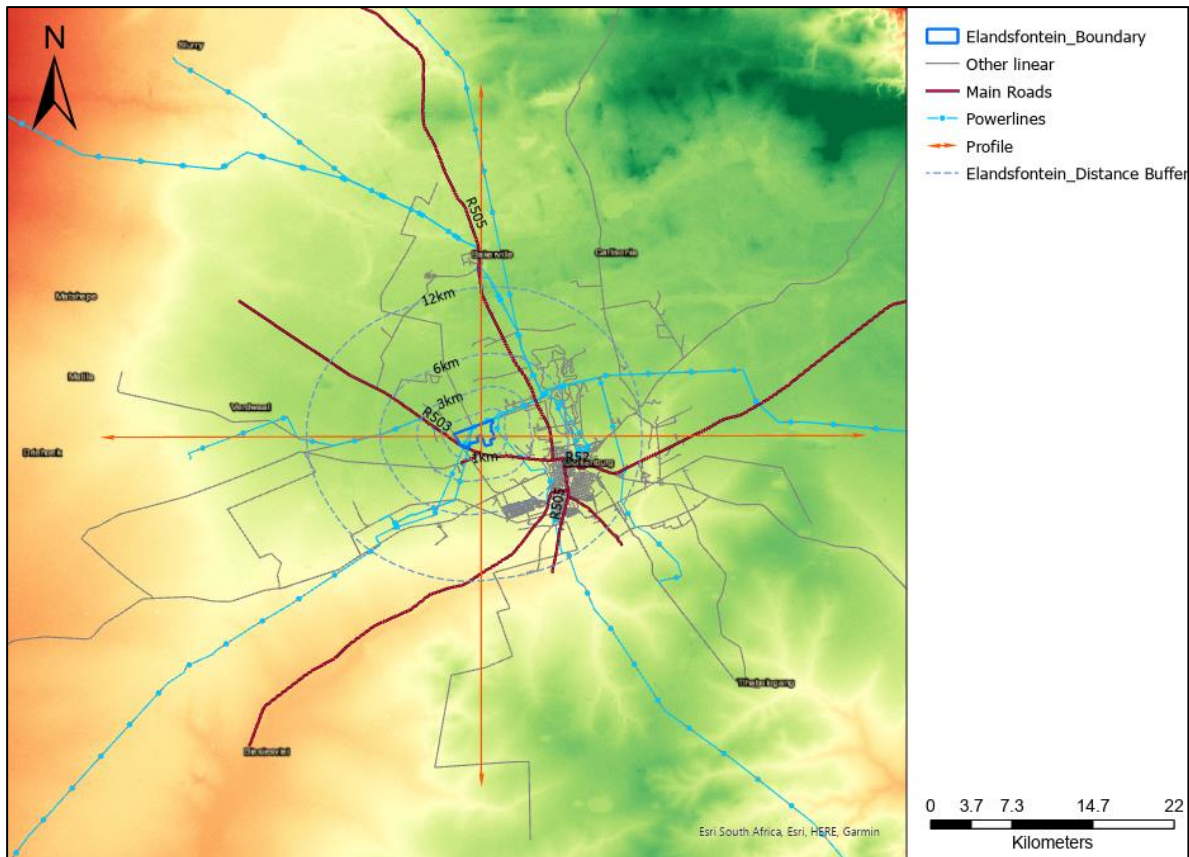
4.11.5 Renewable Energy Projects

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

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 53. 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 Social Impact Assessment for the proposed Themeda PV (Annexure E6). The following social context of the surrounding area 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.

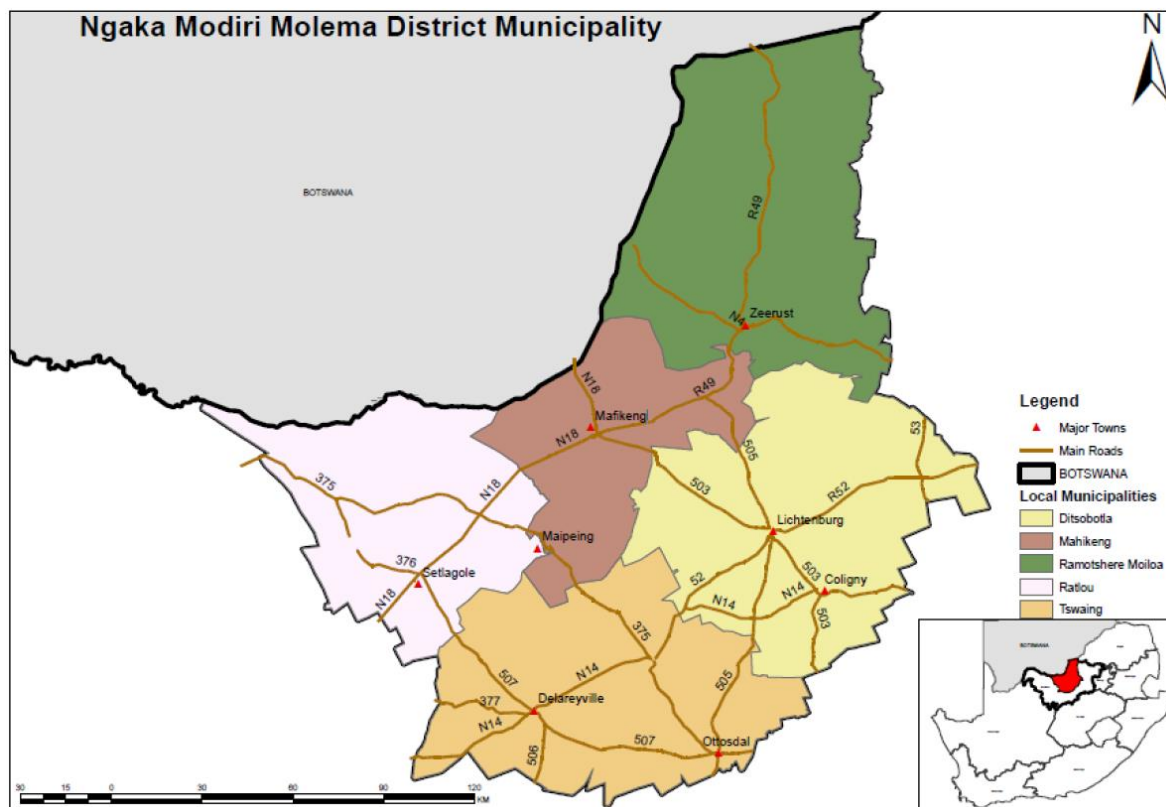


Figure 54: Location of Ngaka Modiri Molema District Municipality and Ditsobotla Local Municipality (Barbour, 2022).

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%). 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%).

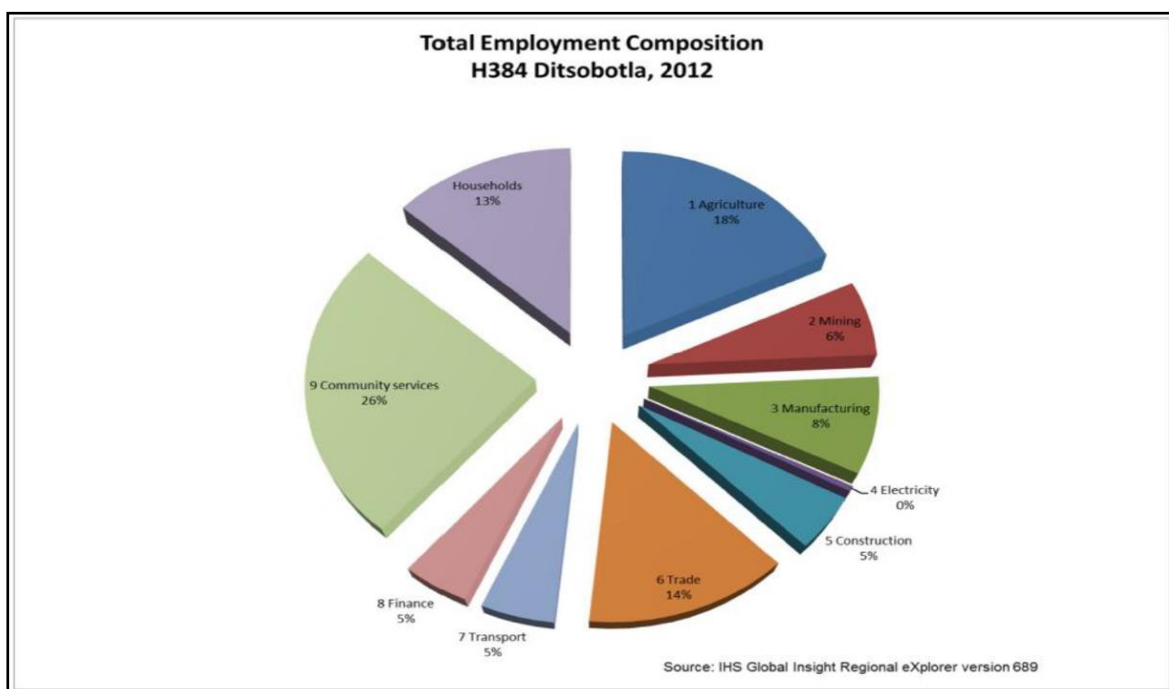


Figure 55: Contribution to employment of economic sectors (Barbour 2022)

4.13 ECONOMIC CONTEXT OF THE PROPOSED PROJECT

The following economic context is provided as part of this Impact Assessment.

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.

4.13.2 Project specific costs

The Themeda PV detailed costing has not been completed on the date of submitting this Impact Assessment 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.

4.13.3 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 Themeda PV is intended to be lodged under the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) 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 16: Preliminary implementation schedule.

	Description	Timeline
1	Expected IPPPP submission date (6th round)	Last Quarter 2022.
2	Preferred bidders selected	First Quarter 2023
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.

NOTE: Themeda PV intends submitting their bid during the 6th bidding window or thereafter if unsuccessful in immediate bidding rounds.

Due to the timeframe uncertainties associated with future bid windows in the DMR's REIPPP Programme, the validity period of any Authorisation should be as follows:

- Commencement of activities within 10 years of the date of the EA.
- Completion of all non operational activities within 5 year's of commencement.

6 PLANNING CONTEXT

A Planning specialist has been appointed to provide Input into this Environmental Assessment Process. 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 ASSESSMENT OF IMPACTS

The Plan of Study for the environmental Impact Assessment (PosEIA) was approved by the DFFE on 23 June 2022. In compliance with the approved PosEIA, the following aspects have been assessed in this Draft EIR.

Table 17: Impacts Assessed in the Environmental Impact Report.

Specialist Discipline	Nature of impact to be assessed.	Project phase
Ecology (Terrestrial) and Aquatic	Loss and fragmentation of vegetation communities in the vicinity of the project area	Construction, Operation and Decommissioning
	Negative fragmentation effects	
	Movement of faunal species	
	Direct and indirect loss and disturbance of faunal species and community	
Avifaunal	Direct and indirect loss and disturbance of species of conservation concern	Construction, Operation and Decommissioning
	The loss of habitat and subsequent displacement of bird species.	
Agriculture	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
	Loss of areas of grazing areas where livestock can be produced	Construction and Operation.
	Soil compaction	Construction
	Soil erosion	Construction and Operation
	Loss of soil fertility through disturbance of in situ horizon organisation	Construction
Heritage	Soil chemical pollution	Construction and Operation
	Direct impact on heritage Resources identified within the study site.	Construction
Visual	Loss of site landscape character from the removal of vegetation and the construction of the PV structures and associated infrastructure;	Construction
	Wind-blown dust due to the removal of large areas of vegetation	
	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;	Operation
	Massing effect on the landscape from a large-scale modification;	
	On-going soil erosion;	
	On-going windblown dust	Decommissioning
	Movement of vehicles and associated dust;	
	Windblown dust from the disturbance of cover vegetation / gravel	
Social	Creation of employment and business opportunities, and opportunity for skills development and on-site training.(Positive)	Construction, Operation and Decommissioning
	Impacts associated with the presence of construction workers on local communities.	Construction

Specialist Discipline	Nature of impact to be assessed.	Project phase
	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

This section of the report was completed with input from the following specialists:

- Terrestrial Biodiversity (The Biodiversity Company, 2022)
- Avifauna (Pachnoda Consulting, 2022)
- Plant Species (The Biodiversity Company, 2022)
- Animal Species (The Biodiversity Company, 2022)
- Aquatic Biodiversity (The Biodiversity Company, 2022)
- Agricultural (TerraAfrica 2022)
- Palaeontology (Marion Bamford, 2022)
- Archaeology and Heritage (Beyond Heritage, 2022)
- Visual (VRMA, 2022)
- Socio Economic (Tony Barbour, 2022)
- Traffic (Sivest, 2022)
- Stormwater (Sivest, 2022)
- Town and Regional Planning (Townscape Planning Solutions, 2022)
- Geotechnical (Council for Geoscience, 2022)

The impacts will firstly be discussed per specialist discipline and then summarised in the impact summary and statement below.

1.1 ASSESSMENT METHODOLOGY

All possible impacts need to be assessed – the **direct, in-direct as well as cumulative impacts**. The following general assessment methodology has been applied:

- **Nature of the impact:** impacts associated with the proposed PV have been described in terms of whether they are negative or positive and to what extent.
- **Duration of impacts:** Impacts were assessed in terms of their anticipated duration:
 - Short term (e.g., during the construction phase – 0 – 2 years)
 - Medium term (e.g., during part or all of the operational phase – 2 - 20 years)
 - Long term (e.g., > 20 years)
 - Permanent (e.g., where the impact is for all intents and purposes irreversible)
 - Discontinuous or intermittent (e.g., where the impact may only occur during specific climatic conditions or during a particular season of the year)
- **Intensity or magnitude:** The size of the impact (if positive) or its severity (if negative):

- Low, where the receiving environment (biophysical, social, economic, cultural etc) is negligibly affected or where the impact is so low that the remedial action is not required;
 - Medium, where the receiving environment (biophysical, social, economic, cultural etc) is altered, but not severely affected, and the impact can be remedied successfully; and
 - High, where the receiving environment (biophysical, social, economic, cultural etc) would be substantially (i.e., to a very large degree) affected. If a negative impact, could lead to irreplaceable loss of a resource and/or unacceptable consequences for human wellbeing.
- **Probability:** Should describe the likelihood of the impact actually occurring indicated as:
 - Improbable, where the possibility of the impact is very low either because of design or historic experience;
 - Probable, where there is a distinct possibility that the impact will occur;
 - Highly probable, where it is most likely that the impact will occur; or
 - Definite, where the impact will occur regardless of any prevention measures.
 - **Significance:** The significance of impacts can be determined through a synthesis of the assessment criteria. Significance can be described as:
 - Low, where it would have negligible effect on the receiving environment (biophysical, social, economic, cultural etc), and on the decision;
 - Medium, where it would have a moderate effect on the receiving environment (biophysical, social, economic, cultural etc), and should influence the decision;
 - High, where it would have, or there would be a high risk of, a large effect on the receiving environment (biophysical, social, economic, cultural etc). These impacts should have a major influence on the decision;
 - Very high, where it would have, or there would be a high risk of, an irreversible negative impact on the receiving environment (biophysical, social, economic, cultural etc) and irreplaceable loss of natural capital/resources or a major positive effect on human well-being. Impacts of very high significance should be a central factor in decision-making.
 - Provision should be made for with and without mitigation scenarios.
 - **Reversibility:**
 - Reversible, the impact can be managed to a low to high degree and is not permanent;
or
 - Irreversible, the impact can only be managed to a limited degree and is permanent.
 - **Confidence:** The level of confidence in predicting the impact can be described as:
 - Low, where there is little confidence in the prediction, due to inherent uncertainty about the likely response of the receiving ecosystem, or inadequate information;
 - Medium, where there is a moderate level of confidence in the prediction, or
 - High, where the impact can be predicted with a high level of confidence
 - **Consequence:** What will happen if the impact occurs
 - Insignificant, where the potential consequence of an identified impact will not cause detrimental impact to the receiving environment;

- Significant, where the potential consequence of an identified impact will cause detrimental impact to the receiving environment.
- Provision must be made for with and without mitigation scenarios.

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

- **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.

- **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.

Care must be taken to ensure that where cumulative impacts can occur that these impacts are considered and categorised as **additive** (incremental or accumulative); **interactive**, **sequential** or **synergistic**.

Based on a synthesis of the information contained in the above-described procedure, the specialists assessed 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.

Where relevant, all specialists have assessed the preferred footprint (Layout Alternative 2) and the No-Go Alternative using the abovementioned general methodology as a basis. Please note that each specialist utilises rating and waiting criteria specific to their discipline in order to determine the significance of specific impacts.

For ease of reference, the significance and status of impacts reflected in all the assessment tables in the following sections are also visually reflected using the following colour scheme¹⁶.

All positive impacts (regardless of their significance)	
Very low or low negative impacts	
Medium negative impacts	
Medium – High negative impacts	
High and Very High negative impacts	

¹⁶ Where specialist ratings fall across 2 of the groups, the worst case is reflected in the quick reference.

7.1 TERRESTRIAL BIODIVERSITY IMPACTS

A Terrestrial Biodiversity Impact Assessment (covering Animal Species, Plant Species and Terrestrial Biodiversity) was undertaken by the Biodiversity Company and is attached in Annexure E1. The following has been summarised from this assessment.

7.1.1 Construction Phase Terrestrial Biodiversity Impacts

The following terrestrial biodiversity impacts were assessed for the construction phase of the proposed PV facility and associated infrastructure.

Table 18: Assessment of Construction Phase Terrestrial Biodiversity Impacts.

Nature: Destruction, fragmentation and degradation of habitats and ecosystems.		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered.	Significant / ecosystem structure and function moderately altered
Probability	Definite	Likely
Significance	High	Medium
Status	Negative	Negative
Reversibility	Partly reversible	Partly Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Disruption/alteration of species activities due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration).		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Great / harmful/ ecosystem structure and function largely altered
Probability	Likely	Possible
Significance	Medium - High	Medium
Status	Negative	Negative
Reversibility	Reversible, with exception of mortalities.	Reversible, with exception of mortalities.
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology highly sensitive /important	Ecology highly sensitive /important

Can impact be mitigated?	Yes
Mitigation:	Mitigation measures outlined in section 7.

Nature: Mortalities and displacements of fauna and flora SCCs		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Permanent	Permanent
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Significant / ecosystem structure and function moderately altered
Probability	Definite	Highly likely
Significance	Medium - High	Medium
Status	Negative	Negative
Reversibility	Mortality not Reversible, Displacement Partially Reversible	Mortality not Reversible, Displacement Partially Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Spilling of hazardous chemicals into the receiving environment and penetrating into sensitive habitats		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m.	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	One year to five years: Medium Term	One day to one month: Temporary
Magnitude / Severity	Significant / ecosystem structure and function moderately altered.	Disastrous / ecosystem structure and function seriously to critically altered
Probability	Definite	Highly unlikely
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Chemical pollution associated with dust suppressants		
	Without Mitigation	With Mitigation

Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	One year to five years: Medium Term	One day to one month: Temporary
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Significant / ecosystem structure and function moderately altered
Probability	Likely	Highly unlikely
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Spread and/or establishment of alien and/or invasive species		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Small / ecosystem structure and function largely unchanged
Probability	Definite	Possible
Significance	Medium - High	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

7.1.2 Operational Phase Terrestrial Biodiversity impacts

The following terrestrial biodiversity impacts were assessed for the operational phase of the proposed PV facility and associated infrastructure.

Table 19: Assessment of Operational Phase Terrestrial Biodiversity Impacts.

Nature: Continued IAP encroachment into disturbed areas arising from construction activity		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m

Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Small / ecosystem structure and function largely unchanged
Probability	Definite	Possible
Significance	Medium to High	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Habitat fragmentation of habitats due to barrier effect of security fencing		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Significant / ecosystem structure and function moderately altered
Probability	Definite	Likely
Significance	Medium - High	Medium
Status	Negative	Negative
Reversibility	Completely reversible by removing of fences.	Completely reversible by removing of fences.
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration)		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Great / harmful/ ecosystem structure and function largely altered
Probability	Likely	Likely

Significance	Medium	Medium
Status	Negative	Negative
Reversibility	Mortalities irreversible, Displacement Reversible.	Mortalities irreversible, Displacement Reversible.
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive / /important	Ecology moderately sensitive / /important
Can impact be mitigated?	Partially	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Chemical pollution associated with measures to keep PV clean		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Permanent	One day to one month: Temporary
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Great / harmful/ ecosystem structure and function largely altered
Probability	Definite	Highly unlikely
Significance	Medium to High	Low
Status	Negative	Negative
Reversibility	Not Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive / /important	Ecology moderately sensitive / /important
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Entrapment in perimeter fences		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Permanent	Permanent
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Small / ecosystem structure and function largely unchanged
Probability	Likely	Highly unlikely
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive / /important	Ecology moderately sensitive / /important
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

7.1.3 Decommissioning Phase Terrestrial Biodiversity Impacts

The following terrestrial biodiversity impacts were assessed for the Decommissioning and closure phase of the proposed PV facility and associated infrastructure.

Table 20: Assessment of Decommissioning Phase Terrestrial Biodiversity Impacts.

Nature: Continued destruction, fragmentation and degradation of habitats and ecosystems.		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Great / harmful/ ecosystem structure and function largely altered
Probability	Definite	Possible
Significance	Medium - High	Low
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Disruption/alteration of species activities due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration).		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Great / harmful/ ecosystem structure and function largely altered
Probability	Likely	Possible
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Disruption reversible, mortalities irreversible.	Disruption reversible, mortalities irreversible.
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated?	Yes	

Mitigation:	Mitigation measures outlined in section 7.
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Nature: Continued spread and/or establishment of alien and/or invasive species		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Great / harmful/ ecosystem structure and function largely altered
Probability	Definite	Possible
Significance	Medium - High	Low
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

7.1.1 Concluding Statement – Terrestrial Biodiversity Impacts

The Terrestrial Biodiversity specialists have confirmed that the construction and operation of the infrastructure are not anticipated to pose significant threats to the receiving environment provided the mitigation measures are effectively applied.

The Terrestrial Biodiversity Specialist furthermore confirmed that no fatal flaws are evident for the proposed project and that the average post-mitigation impact significance for the project is moderately low.

The Specialist concluded that the project may be favourably considered, on condition that all prescribed mitigation measures and supporting recommendations are implemented.

7.2 AVIFAUNAL IMPACTS

An Avifaunal Impact Assessment was undertaken by Mr Lucas Niemand from Pachnoda Consulting and is attached in Annexure E2. The following has been summarised from this assessment.

7.2.1 Construction Phase Avifaunal Impacts.

The following Avifaunal Impacts were assessed for the construction phase of the proposed PV facility and associated infrastructure.

Table 21: Assessment of construction Phase Avifaunal Impacts.

Nature: Losses of natural habitat and displacement of birds through physical transformation, modifications, removals and land clearance..		
	Without Mitigation	With Mitigation

Extent / Spatial Scope	Local	Local
Duration	Permanent	Permanent
Magnitude / Severity	Moderate	Moderate
Probability	Definite	Highly Probable
Significance	High	Medium
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources / Sensitivity of receiving environment.	Yes	Yes
Can impact be mitigated?	Yes, to some extent	
Mitigation:	Mitigation measures outlined in section 7.	

7.2.2 Operational Phase Avifaunal Impacts

The following Avifaunal Impacts were assessed for the Operational phase of the proposed PV facility and associated infrastructure.

Table 22: Assessment of Operational Phase Avifaunal Impacts

Nature: The creation of novel or new avian habitat for commensal bird species or superior competitive species.		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Footprint	Footprint
Duration	Medium-term	Medium-term
Magnitude / Severity	Minor	Minor
Probability	Probable	Improbable
Significance	Low	Low
Status	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources / Sensitivity of receiving environment.	No	No
Can impact be mitigated?	Yes, with experimentation	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Avian collision impacts related to the PV facility during the operation phase (collision with the PV panels).		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Long-term	Long-term
Magnitude / Severity	Low	Minor
Probability	Probable	Improbable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Low	Low

Irreplaceable loss of resources / Sensitivity of receiving environment.	No, although threatened species are present in the wider area, these are likely to become displaced while waterbirds are uncommon due to the absence of prominent water/wetland features in the area.	Low
Can impact be mitigated?	Yes, to some extent	
Mitigation:	Mitigation measures outlined in section 7.	

7.2.3 Decommissioning Phase Avifaunal Impacts

The Specialist did not identify any avifaunal impacts associated with the closure and decommissioning phase of the development, but concluded that during rehabilitation (after removal of the panels) that the vegetation will revert to secondary grassland and shrubland resulting in a decreased bird species richness with low evenness values on a local scale.

7.2.4 Concluding Statement – Avifaunal Impacts

The Avifaunal specialist confirmed that four prominent avifaunal habitat types were identified on the site and consisted of open mixed dolomite grassland with bush clump mosaics, moist dense grassland, mixed woodland on dolomite outcrops and secondary grassland and pastures.

High bird richness and abundance values were recorded at the mixed woodland. The critically endangered White-backed Vulture (*Gyps africanus*) and endangered Cape Vulture (*G. coprotheres*) have a high probability of occurrence, mainly as foraging birds soaring overhead. Eleven southern African endemics and 12 near-endemic species were confirmed on the study site.

An evaluation of potential and likely impacts on the avifauna revealed that the impact significance was moderate to low after mitigation. The study site is not located near any prominent wetland system or impoundment, and therefore the risk of waterbird collisions with the proposed infrastructure was considered to be low. In addition, the occurrence of collision-prone bird species (apart from vultures) such as korhaan taxa and birds of prey was relatively low. However, in the absence of sufficient information on the occurrence and rate of passing waterbirds and collision-prone bird species, it was recommended that supporting evidence be acquired by means of at least another pre-construction survey corresponding to the wet season.

The specialist concluded that No fatal-flaws were identified during the assessment, and strongly recommended that the proposed mitigation measures and monitoring protocols (additional with pre- and post construction monitoring) be implemented during the construction and operational phase of the project¹⁷.

7.3 AGRICULTURAL IMPACTS.

An Avifaunal Impact Assessment was undertaken by Ms Mariné Pienaar from Terra Africa and is attached in Annexure E3. The following has been summarised from this assessment.

¹⁷ This Monitoring protocol suggested by the Avifaunal Specialist has been incorporated into the Environmental Management Programme that is attached in Appendix H.

7.3.1 Construction Phase Agricultural Impacts.

The following Agricultural Impacts were assessed for the construction phase of the proposed PV facility and associated infrastructure

Table 23: Assessment of Construction Phase Agricultural Impacts.

Nature: Change in land use from livestock farming to energy generation		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Medium duration	Medium duration
Magnitude / Severity	Moderate	Low
Probability	Definite	Definite
Significance	Medium	Medium
Status	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources / Sensitivity of receiving environment.	Yes	Yes
Can impact be mitigated?	No	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Soil erosion		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Medium-term	Medium-term
Magnitude / Severity	Moderate	Low
Probability	Probable	Improbable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources / Sensitivity of receiving environment.	Yes	No
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Soil compaction		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Medium-term	Medium-term
Magnitude / Severity	Moderate	Low
Probability	Probable	Improbable
Significance	Medium	Low

Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources / Sensitivity of receiving environment.	Yes	No
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Soil pollution ¹⁸		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Short-term	Short-term
Magnitude / Severity	Moderate	Low
Probability	Low	Improbable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources / Sensitivity of receiving environment.	Yes	No
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

7.3.2 Operational Phase Agricultural Impacts

The following Agricultural Impacts were assessed for the operational phase of the proposed PV facility and associated infrastructure.

Table 24: Assessment of operational phase Agricultural Impacts

Nature: : Soil erosion		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local

¹⁸ Soil pollution during construction can arise from the following sources:

1. Petroleum hydrocarbon spills by machinery and vehicles during earthworks;
2. Spills from vehicles transporting workers, equipment, and construction material;
3. The accidental spills from temporary chemical toilets used by construction workers;
4. The generation of domestic waste by construction workers;
5. Spills from fuel storage tanks during construction;
6. Pollution from concrete mixing;
7. Pollution from road-building materials; and
8. Any construction material remaining within the construction area once construction is completed.

Duration	Medium-term	Medium-term
Magnitude / Severity	Moderate	Low
Probability	Probable	Improbable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources / Sensitivity of receiving environment.	Yes	No
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Soil pollution		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Short-term	Short-term
Magnitude / Severity	Moderate	Low
Probability	Low	Improbable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources / Sensitivity of receiving environment.	Yes	No
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

7.3.3 Decommissioning Phase Agricultural Impacts

The following Agricultural Impacts were assessed for the closure and decommissioning phase of the proposed PV facility and associated infrastructure¹⁹.

Table 25: Assessment of decommissioning phase Agricultural Impacts.

Nature: Change in land use from livestock farming to energy generation		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Medium duration	Medium duration
Magnitude / Severity	Moderate	Low
Probability	Definite	Definite
Significance	Medium	Medium

¹⁹ The Agricultural Specialist confirmed that the Decommissioning Phase Impacts on Agricultural Resources will be the same as the Construction Phase Impacts.

Status	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources / Sensitivity of receiving environment.	Yes	Yes
Can impact be mitigated?	No	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Soil erosion		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Medium-term	Medium-term
Magnitude / Severity	Moderate	Low
Probability	Probable	Improbable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources / Sensitivity of receiving environment.	Yes	No
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Soil compaction		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Medium-term	Medium-term
Magnitude / Severity	Moderate	Low
Probability	Probable	Improbable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources / Sensitivity of receiving environment.	Yes	No
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

Nature: Soil pollution		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Short-term	Short-term

Magnitude / Severity	Moderate	Low
Probability	Low	Improbable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources / Sensitivity of receiving environment.	Yes	No
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 7.	

7.3.4 Concluding statement – Agricultural Impacts

The Agricultural Specialist confirmed that the soil forms present within the development area consist of shallow Mispah soils underlain by rock that has severe limitations to rainfed crop production as well as Carolina, Clovelly and Vaalbos soils with effective depth between 0.4m and 0.8m. Even though the effective depth of the Carolina, Clovelly and Vaalbos soils are deeper than that of the Mispah soils, the areas where these soils are shallower than 0.6m, is still not considered suitable for rainfed crop production.

There is no irrigation infrastructure, such as centre pivots or drip irrigation, present within the project area. The grazing capacity, is 8ha/LSU, indicating that the proposed development area has forage to feed 31 head of cattle.

All agricultural impacts during construction and operation of the proposed PV facility and Associated Infrastructure will range from medium to low. Through the consistent implementation of the recommendation mitigation measures, most of impacts can all be reduced to low.

The agricultural specialist concluded that this application be considered favourably, on condition that the mitigation measures are followed to prevent soil erosion and soil pollution and to minimise impacts on the veld quality of the farm portions that will be affected. The project infrastructure should also remain within the proposed project area that will be fenced off.

7.4 HERITAGE IMPACTS.

A Heritage Impact Assessment was undertaken by Mr Jaco van der Walt from Beyond Heritage and is attached in Annexure E4. The Heritage Impact Assessment includes a Palaeontological assessment compiled by Prof Marion Bamford.

The heritage impacts occur during the construction phase on the heritage features identified within the study site²⁰

7.4.1 Construction Phase Heritage Impacts.

The following Heritage Impacts were assessed for the construction phase of the proposed PV facility and associated infrastructure

²⁰ The recorded Stone Age Scatter at EF 001 is scattered too sparsely to be of significance apart from mentioning it in this report and can be attributed to background scatter generally speaking of low significance. It is also located outside of the impact area but similar occurrences could occur in the study area.

Table 26: Assessment of Construction Phase Heritage Impacts

Nature: Impacts during the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Permanent	Permanent
Magnitude / Severity	Minor	Minor
Probability	Improbable	Improbable
Significance	Low	Low
Status	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Yes	Yes
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

7.4.2 Operational Phase Heritage Impacts

All Impacts on surface and sub surface heritage resources occur during the construction phase of the development and persist through all phases, i.e. they are not reversible.

7.4.3 Closure and Decommissioning Phase Heritage Impacts

All Impacts on surface and sub surface heritage resources occur during the construction phase of the development and persist through all phases, i.e. they are not reversible.

7.4.4 Concluding Statement – Heritage Impacts

The heritage consultant found that the project area is characterised by agricultural activities (mainly grazing) without any major focal points like pans or hills that would have attracted human occupation in antiquity. The project area was surveyed as part of the larger project for the Elandsfontein PV Cluster and heritage finds in the larger area were limited to Stone Age scatters in low densities in an open-air context. Raw material for tool manufacture is almost exclusively on chert that is readily available in the area and artefacts recorded in the area show typological traits associated with the Middle Stone Age and Late Stone Age.

Examination of historical topographic maps and aerial images also showed no structures or stone walled settlements in the study area. According to the SAHRA Paleontological sensitivity map the study area is of very high paleontological significance, and this was addressed in an independent study by Bamford (2022). The study concludes that it is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur below the ground surface in the dolomites of the Oaktree and Monte Christo Formation (Malmani Subgroup, Chuniespoort Group, Pretoria Supergroup) and may be disturbed²¹.

The overall impact of the project is considered to be low and residual impacts can be managed to an acceptable level through implementation of the recommendations made in this report. The socio-

²¹ A Fossil Chance find procedure has been included in the EMP

economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

The Heritage specialist concluded that no adverse impact on heritage resources is expected by the project and has recommended that the project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- Implementation of a chance find procedure for the project (as outlined in Section 10.2).
- The study area should be monitored by the ECO.

7.5 VISUAL IMPACTS

A visual Impact Assessment was undertaken by Mr Stephen Stead from Visual Resource Management Africa and is attached in Annexure E5. The following has been summarised from this assessment.

7.5.1 Construction Phase Visual Impacts

The following Visual Impacts were assessed for the construction phase of the proposed PV facility and associated infrastructure.

Table 27: Assessment of construction phase visual impacts.

Nature: Short-term landscape change from the current rural agricultural sense of place to the semi-industrial Renewable Energy landscape		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Short term	Short term
Magnitude / Severity	Medium to High	Medium to Low
Probability	Likely	Likely
Significance	Medium	Medium to Low
Status	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources / Sensitivity of receiving environment	Reversible after decommissioning	Reversible after decommissioning
Can impact be mitigated?	Medium Mitigation viability	
Mitigation:	Mitigation measures outlined in section 8	

7.5.2 Operational Phase Visual Impacts

The following Visual Impacts were assessed for the operational phase of the proposed PV facility and associated infrastructure.

Table 28: Assessment of operational phase visual impacts.

Nature: Short-term landscape change from the current rural agricultural sense of place to the semi-industrial Renewable Energy landscape (Loss of site landscape character due to the operation of the PV structures and associated infrastructure).		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Long term	Long term
Magnitude / Severity	Medium	Medium to Low

Probability	Likely	Likely
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources / Sensitivity of receiving environment	Reversible after decommissioning	Reversible after decommissioning
Can impact be mitigated?	Medium	
Mitigation:	Mitigation measures outlined in section 8	

7.5.3 Decommissioning Phase Visual Impacts

The following Visual Impacts were assessed for the closure and decommissioning phase of the proposed PV facility and associated infrastructure.

Table 29: Assessment of Decommissioning phase visual impacts.

Nature: Short-term landscape change from the removal of the PV structures, followed by rehabilitation of the impacted areas back to agricultural lands.		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local	Local
Duration	Short term	Short term
Magnitude / Severity	Medium	Medium
Probability	Likely	Likely
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources / Sensitivity of receiving environment	Impact will persist until completion of rehabilitation.	Impact will persist until completion of rehabilitation.
Can impact be mitigated?	Medium	
Mitigation:	Mitigation measures outlined in section 8	

7.5.4 Concluding Statement - Visual

The Visual Specialist concluded that the proposed development should commence with mitigation for the following key reasons:

- Alignment with National planning related to energy and job creation.
- Moderated Zone of Visual Influence with no tourism activities or tourist view-corridors.
- Receptors sensitive to landscape change are limited but do include the adjacent farmers with High levels of Visual Exposure.

The following mitigation is required to ensure that the landscape change remains congruent with the rural agricultural landscape character:

- A 50m buffer on the property boundary is recommended., with 100m buffer from the R503. Medium sized thornveld trees in this area should be retained, and encouraged to grow, and the area should be fenced off to allow for a continuation of the existing low intensity animal farming.

7.6 SOCIAL IMPACTS

A social Impact Assessment was undertaken by Mr Tony Barbour and Mr Schalk van der Merwe from Tony Barbour Environmental Consulting and is attached in Annexure E6. The following has been summarised from this assessment.

7.6.1 Construction Phase Social Impacts

The following Social Impacts were assessed for the construction phase of the proposed PV facility and associated infrastructure.

Table 30: Assessment of Construction Phase Social Impacts

Nature: Creation of employment and business opportunities during the construction phase		
	Without Mitigation	With Enhancement
Extent	Local – Regional	Local – Regional
Duration	Short term	Short term
Magnitude	Moderate	Moderate
Probability	Highly probable	Highly probable
Significance	Medium	Medium
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	N/A
Can impact be enhanced?	Yes	
Enhancement:	Mitigation and enhancement measures outlined in section 8	

Nature: Potential impacts on family structures and social networks associated with the presence of construction workers		
	Without Mitigation	With Mitigation
Extent	Local	Local
Duration	Short term for community as a whole	Short term for community as a whole
Magnitude	Moderate for the community as a whole	Low for community as a whole
Probability	Probable	Probable (3)
Significance	Medium	Low
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Potential impacts on family structures, social networks and community services associated with the influx of job seekers		
	Without Mitigation	With Mitigation
Extent	Local	Local (1)
Duration	Permanent (For job seekers that stay on in the area)	Permanent (For job seekers that stay on in the area)
Magnitude	Minor	Minor
Probability	Probable	Probable
Significance	Low	Low
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation	Mitigation measures outlined in section 8	

Nature: Potential risk to safety of scholars, farmers and farm workers, livestock and damage to farm infrastructure associated with the presence of construction workers on site		
	Without Mitigation	With Mitigation
Extent	Local	Local
Duration	Short term	Short term
Magnitude	Medium	Low
Probability	Probable	Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock losses and damage to farm infrastructure etc.	Yes, compensation paid for stock losses and damage to farm infrastructure etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of grass fires		
	Without Mitigation	With Mitigation
Extent	Local	Local
Duration	Short term	short term

Magnitude	Moderate due to reliance on agriculture for maintaining livelihoods	Low
Probability	Probable	Probable (3)
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock and crop losses etc.	Yes, compensation paid for stock and crop losses etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Potential noise, dust and safety impacts associated with construction related activities		
	Without Mitigation	With Mitigation
Extent	Local	Local
Duration	Short Term	Short Term
Magnitude	Medium	Minor
Probability	Probable	Probable (3)
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the project etc. will damage farmlands and result in a loss of farmlands for grazing.		
	Without Mitigation	With Mitigation
Extent	Local	Local
Duration	Long term-permanent if disturbed areas are not effectively rehabilitated	Short term if damaged areas are rehabilitated
Magnitude	Medium	Minor
Probability	Probable	Highly Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Yes, disturbed areas can be rehabilitated	Yes, disturbed areas can be rehabilitated

Irreplaceable loss of resources?	Yes, loss of farmland. However, disturbed areas can be rehabilitated	Yes, loss of farmland. However, disturbed areas can be rehabilitated
Can impact be mitigated?	Yes, however, loss of farmland cannot be avoided	Yes, however, loss of farmland cannot be avoided
Mitigation:	Mitigation measures outlined in section 8	

7.6.2 Operational Phase Social Impacts

The following Social Impacts were assessed for the operational phase of the proposed PV facility and associated infrastructure.

Table 31: Assessment of social impacts during the operational phase of the development.

Nature: Development of infrastructure to improve energy security and support renewable sector		
	Without Mitigation	With Mitigation
Extent	Local, Regional and National	Local, Regional and National
Duration	Long term	Long term
Magnitude	High	High
Probability	Highly Probable	Definite
Significance	High	High
Status	Positive	Positive
Reversibility	Yes	Yes
Irreplaceable loss of resources?	Yes, impact of climate change on ecosystems	Reduced CO2 emissions and impact on climate change
Can impact be mitigated?	Yes	
Enhancement:	Mitigation and Enhancement measures outlined in section 8	

Nature: Creation of employment and business opportunities associated with the operational phase		
	Without Mitigation	With Enhancement
Extent	Local and Regional	Local and Regional
Duration	Long term	Long term
Magnitude	Minor	Low
Probability	Highly Probable	Highly Probable
Significance	Low	Medium
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	No
Can impact be enhanced?	Yes	
Enhancement: See below	Mitigation and Enhancement measures outlined in section 8	

Nature: The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for sheep and farming inputs, such as feed etc.		
	Without Mitigation	With Enhancement

Extent	Local	Local
Duration	Long term	Long term
Intensity	Low	Moderate
Likelihood	Probable	Definite
Significance	Low	Medium
Status	Positive	Positive
Reversibility	Yes	Yes
Can impact be enhanced?	Yes	
Enhancement:	Mitigation and Enhancement measures outlined in section 8	

Nature: Benefits associated with support for local community's form Socio Economic Development contributions		
	Without Mitigation	With Enhancement²²
Extent	Local and Regional	Local and Regional
Duration	Long term	Long term
Intensity	Low	Moderate
Likelihood	Probable	Definite
Significance	Medium	High
Status	Positive	Positive
Reversibility	Yes	Yes
Can impact be enhanced?	Yes	
Enhancement:	Mitigation and Enhancement measures outlined in section 8	

Nature: Visual impact associated with the proposed facility and associated infrastructure and the potential impact on the areas rural sense of place.		
	Without Mitigation	With Mitigation
Extent	Local	Local
Duration	Long term	Long term
Magnitude	Minor	Minor
Probability	Probable	Probable
Significance	Low	Low
Status	Negative	Negative
Reversibility	Yes, SEF components and other infrastructure can be removed.	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation	Mitigation measures outlined in section 8	

²² Enhancement assumes effective management of the community trust

Nature: Potential impact of the PV facility on property values		
	Without Mitigation	With Enhancement / Mitigation
Extent	Local	Local
Duration	Long term	Long term
Magnitude	Minor	Minor
Probability	Probable	Probable
Significance	Low	Low
Status	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impact be enhanced?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Potential impact of the PV facility on local tourism		
	Without Mitigation	With Enhancement / Mitigation
Extent	Local	Local
Duration	Long term	Long term
Magnitude	Minor	Minor
Probability	Probable	Probable
Significance	Low	Low
Status	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impact be enhanced?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

7.6.3 Decommissioning Phase Social Impacts

The social specialist has confirmed that the decommissioning phase social impacts will be largely similar to those associated with the construction phase of the development.

7.6.4 Concluding Statement – Social

The findings of the social impact assessment indicate that the proposed PV Facility and associated infrastructure will result in several social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. The project will also contribute to local economic development through socio-economic development (SED) contributions. In addition, the development will improve energy security and reduce the carbon footprint associated with energy generation. The findings of the SIA also indicate that the potential negative impacts associated with both the construction and operational phase are likely to be Low Negative with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented.

The social specialist concluded that establishment of the proposed PV facility and associated infrastructure is supported by the findings of the Social Impact Assessment.

7.7 TRAFFIC IMPACTS

A social Impact Assessment was undertaken by Merchandt Le Maitre from SiVEST and is attached in Annexure E10. The following has been summarised from this assessment.

7.7.1 Construction Phase Traffic Impacts

The following Traffic Impacts were assessed for the construction phase of the proposed PV Facility and Associated infrastructure.

Table 32: Assessment of Traffic impacts during the construction phase.

Nature: Increase in Traffic		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local / District	Local / District
Duration	Short Term	Short Term
Magnitude / Severity	High	Medium
Probability	Definite	Definite
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of resources	Marginal Loss of resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Increase of Incidents with pedestrians and livestock		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local / District	Local / District
Duration	Short Term	Short Term
Magnitude / Severity	Medium	Low
Probability	Probable	Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Partly Reversible	Partly Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Complete loss of resources	Complete loss of resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Increase in Dust from gravel roads		
	Without Mitigation	With Mitigation

Extent / Spatial Scope	Local / District	Local / District
Duration	Short Term	Short Term
Magnitude / Severity	Medium	Medium
Probability	Probable	Probable
Significance	Low	Low
Status	Negative	Negative
Reversibility	Partly Reversible	Partly Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of Resources	Marginal Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Increase in Road Maintenance		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local / District	Local / District
Duration	Medium Term	Short Term
Magnitude / Severity	Medium	Medium
Probability	Probable	Probable
Significance	Low	Low
Status	Negative	Negative
Reversibility	Partly Reversible	Partly Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of Resources	Marginal Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Additional Abnormal Loads		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Province / Region	Province / Region
Duration	Short Term	Short Term
Magnitude / Severity	Low	Low
Probability	Probable	Possible
Significance	Low	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of Resources	Marginal Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Internal Access Roads (Increase in Dust from gravel roads)		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Site	Site
Duration	Short Term	Short Term
Magnitude / Severity	Medium	Medium
Probability	Definite	Probable
Significance	Low	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	No loss of resources	No loss of resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: New Larger Access Points		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Site	Site
Duration	Short Term	Short Term
Magnitude / Severity	Low	Low
Probability	Definite	Definite
Significance	Low	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of Resources	Marginal Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

7.7.2 Operational Phase Traffic Impacts

The following Traffic Impacts were assessed for the Operational phase of the proposed PV Facility and Associated infrastructure.

Table 33: Assessment of Operational Phase Traffic Impacts

Nature: Increase in Traffic		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local / District	Local / District
Duration	Long Term	Long Term
Magnitude / Severity	Low	Low
Probability	Unlikely	Unlikely
Significance	Low	Low

Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of Resources	Marginal Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Increase of Incidents with pedestrians and livestock		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local / District	Local / District
Duration	Long Term	Long Term
Magnitude / Severity	Low	Low
Probability	Unlikely	Unlikely
Significance	Low	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of Resources	Marginal Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Increase in Dust from gravel roads		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local / District	Local / District
Duration	Long Term	Long Term
Magnitude / Severity	Low	Low
Probability	Unlikely	Unlikely
Significance	Low	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of Resources	Marginal Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Increase in Road Maintenance		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local / District	Local / District
Duration	Long Term	Long Term

Magnitude / Severity	Low	Low
Probability	Unlikely	Unlikely
Significance	Low	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of Resources	Marginal Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Additional Abnormal Loads		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Province / Region	Province / Region
Duration	Long Term	Long Term
Magnitude / Severity	Low	Low
Probability	Unlikely	Unlikely
Significance	Low	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of Resources	Marginal Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: New / Larger Access points		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Site	Site
Duration	Long Term	Long Term
Magnitude / Severity	Low	Low
Probability	Unlikely	Unlikely
Significance	Low	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of Resources	Marginal Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

7.7.3 Decommissioning Phase Traffic Impacts

The following Traffic Impacts were assessed for the Decommissioning and Closure phase of the proposed PV Facility and Associated infrastructure.

Table 34: Assessment of Decommissioning Phase Traffic Impacts

Nature: Increase in Traffic		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local / District	Local / District
Duration	Short Term	Short Term
Magnitude / Severity	High	Medium
Probability	Definite	Definite
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss of Resources	Marginal Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Increase of Incidents with pedestrians and livestock		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local / District	Local / District
Duration	Short Term	Short Term
Magnitude / Severity	Medium	Low
Probability	Probable	Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Partly Reversible	Partly Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Complete Loss of Resources	Complete Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Increase in Dust from gravel roads		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local / District	Local / District
Duration	Short Term	Short Term
Magnitude / Severity	Medium	Medium
Probability	Probable	Probable
Significance	Low	Low

Status	Negative	Negative
Reversibility	Partly Reversible	Partly Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Complete Loss of Resources	Complete Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Low	

Nature: Internal Access Roads (Increase in Dust from gravel roads)		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Site	Site
Duration	Short Term	Short Term
Magnitude / Severity	Medium	Low
Probability	Definite	Probable
Significance	Low	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	No Loss of Resources	No Loss of Resources
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Increase in Road Maintenance		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local / District	Local / District
Duration	Medium Term	Short Term
Magnitude / Severity	Medium	Medium
Probability	Probable	Probable
Significance	Low	Low
Status	Negative	Negative
Reversibility	Partly Reversible	Partly Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss	Marginal Loss
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: Additional Abnormal Loads		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Province / Region	Province / Region
Duration	Short Term	Short Term

Magnitude / Severity	Low	Low
Probability	Possible	Possible
Significance	Low	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss	Marginal Loss
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

Nature: New / Larger Access points		
	Without Mitigation	With Mitigation
Extent / Spatial Scope	Site	Site
Duration	Short Term	Short Term
Magnitude / Severity	Low	Low
Probability	Definite	Definite
Significance	Low	Low
Status	Negative	Negative
Reversibility	Completely Reversible	Completely Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Marginal Loss	Marginal Loss
Can impact be mitigated?	Yes	
Mitigation:	Mitigation measures outlined in section 8	

7.7.4 Concluding Statement - Traffic

The Traffic specialist determined that the construction phase for this development will typically generate the highest number of additional vehicles. Of these additional vehicles, ± 23 trips / hour will occur in the morning and afternoon outside of the peak period, while ± 2 trips / hour will occur during the midday peak for construction material and abnormal loads. The impact will, however, be temporary and is considered to be nominal if adequately mitigated. During the operation phase, the facility will be expected to accommodate ± 50 employees and generate an additional ± 20 trips / day in the morning and afternoon peak period. This impact is considered to be nominal.

The traffic specialist concluded that:

- The proposed access point from Road P28-4 has a sufficient sight distance of > 350 m, is not located within and / or near any drainage lines,
- Access upgrades on Road P28-4 will be required at the access point.
- Access road upgrades between the access position on Road P28-4 and the development will be required.
- The access position upgrades on Road P28-4 require approval and a wayleave application from the North West Department of Public Works & Roads (NWDPWR) before work commences.

The Traffic Specialist concluded that the proposed PV facility and associated infrastructure will have a nominal impact on the existing traffic network. The project is therefore deemed acceptable from a

transport perspective, provided the recommendations and mitigation measures in the report are implemented.

7.8 CUMULATIVE IMPACTS

This section is summarised from the cumulative impact assessments that took place by each of the participating specialists. For further details in this regard, the reader is referred to the specialist assessments contained in **Appendix E**.

Where appropriate, certain specialists did include a cumulative assessment of a much wider area than the accepted 30km radius.

The 2014 EIA Regulations (as amended) (GNR 326) define a cumulative impact as follows:

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

There are a number of other renewable energy facilities in the vicinity of the proposed Themeda PV PV as detailed in the table below.

According the DFFE Database of renewable energy facilities as well as additional projects know to Cape EAPrac, there are 14 renewable energy facilities in the vicinity of Themeda PV. Of these, 7 are authorised and a further 7 are in process.

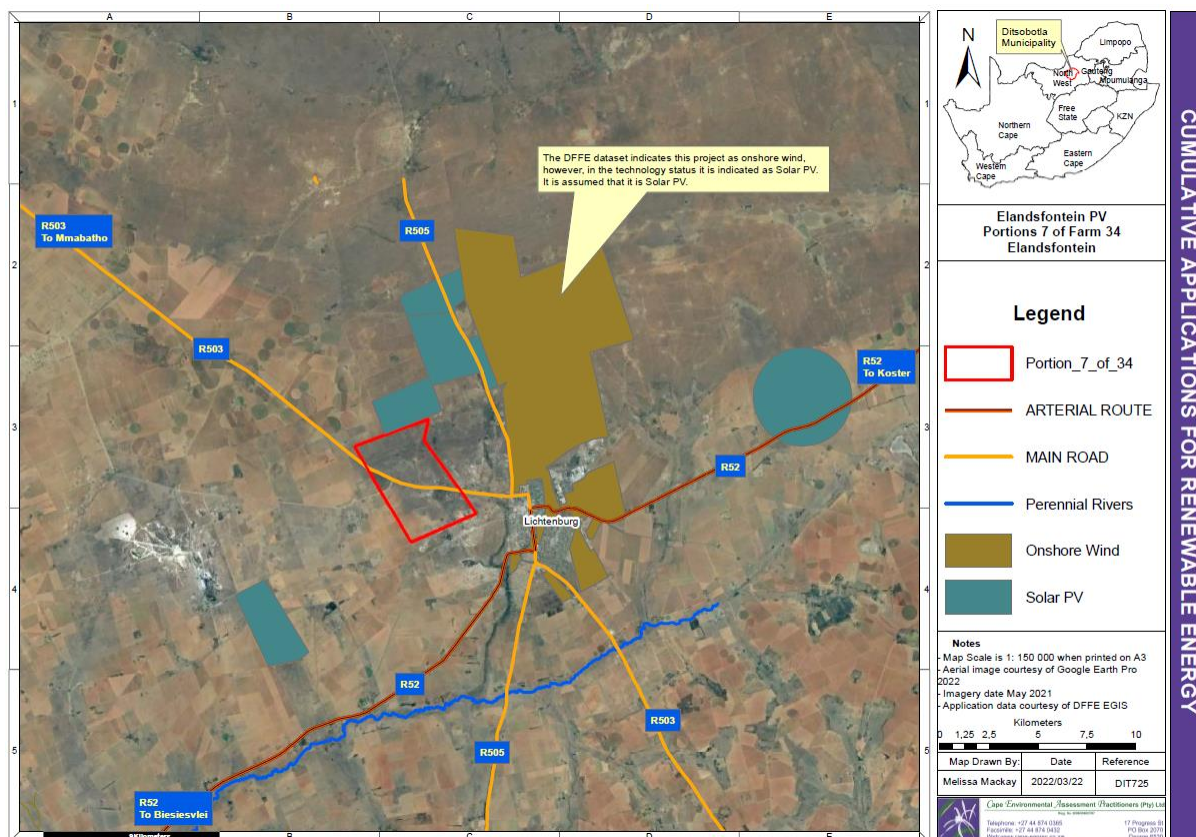


Figure 56: Renewable Energy Facilities within proximity of the proposed Themeda PV

In terms of possible cumulative impacts, one needs to look at the presence of similar facilities on the farm portions as well as the greater landscape, namely:

- Cumulative impacts due to the cumulative effects of Themeda PV added to all other renewable energy facilities in the Lichtenberg area have been assessed. These impacts however need to be managed through strategic spatial planning documents such as an SEA and SDF and not through individual EIA processes.
- Cumulative impacts due to the cumulative effects of the 2 PV Facilities proposed to be co-located on one site.

The table below reflects the other renewable energy facilities in close proximity to the proposed Themeda PV.

Table 35: Renewable Energy Facilities in proximity to Themeda PV and their status

Applicant	Project	Technology	Capacity	Status of Application / Development
Verbena PV (Pty) Ltd	Verbena PV	PV	120MW	In progress
Hillardia PV (Pty) Ltd	Hillardia PV	PV	120MW	In progress
Aristida PV (Pty) Ltd	Aristida PV	PV	120MW	In progress
Euphorbia PV (Pty) Ltd	Euphorbia PV	PV	120MW	In progress
Abo Wind Lichtenburg 2 PV (Pty) Ltd	Lichtenburg 2 Solar Energy Facility	PV	100MW	Authorised
Biotherm Energy (Pty) Ltd	The 75MW Tlisitseng PV1 SEF	PV	75MW	Authorised
Barleria PV (Pty) LTD	Barleria PV	PV	75MW	Authorised
Dicoma PV (Pty) LTD	Dicoma PV	PV	75MW	Authorised
Setaria PV (Pty) LTD	Setaria PV	PV	75MW	Authorised
Abo Wind Lichtenburg 1 PV (Pty) Ltd	Lichtenburg 1 Solar PV	PV ²³	100MW	Authorised
Acsa PV	Bloemfontein Airport	PV	Unknown	Authorised
Hibernia Solar (Pty) Ltd	Hibernia Solar Energy Facility	PV	Unknown	Authorised
Megawatt One Photovoltaic (Pty) Ltd	Hibernia Solar Energy Facility	PV	Unknown	Authorised
Batloung Baga Shole Power Company	Unknown	PV	64MW	Authorised

Cape EAPrac does not have details on the exact configuration of these facilities, however, based on the conservative assumption that approximately 2ha is required per megawatt of energy generated, one can assume the following transformation of the two vegetation types associated with the greater area²⁴.

Table 36: Potential habitat transformation proximity to Themeda PV.

Status	Transformation Area in Hectares
In operation	0
Under construction	0
Authorised	928
EIA in Progress	1330

²³ The DFFE dataset indicates this project as onshore wind, however, in the technology status it is indicated as Solar PV. It is assumed that it is Solar PV.

²⁴ Where generation capacity is not known, it has been assumed as 75 Megawatts.

It is impossible to foresee how many of these projects will reach preferred bidder status in terms of the REIPPPP and will eventually be constructed. As a worst-case scenario one can assume a total transformation of 2258ha of Carletonville Dolomite Grassland (in various states from natural to irreversibly transformed)

Potential cumulative impacts identified for the project include various negative impacts such as loss of habitat, visual massing, loss of agricultural land an influx jobseekers and change in the area's sense of place, but also include positive cumulative impacts on the economy, business development, and employment.

The table below provides a summary of the significance and status of cumulative impacts associated with Themeda PV in conjunction with all other proposed facilities within 30km.

Table 37: Cumulative Impact Assessment Themeda PV.

Nature of Cumulative Impact	Significance Cumulative	Status
Terrestrial Biodiversity		
Loss of Habitat	Medium	Negative
Avifauna		
Regional losses of natural habitat and subsequent displacement of birds.	High	Negative
Avian collision impacts related to the PV facility during the operation phase (collision with the PV panels).	Medium	Negative
Agriculture		
Decrease in areas with suitable land capability for cattle farming.	Medium	Negative
Increase in areas susceptible to soil erosion	Medium	Negative
Increase in areas susceptible to soil erosion	Low	Negative
Increase in areas susceptible to soil pollution	Medium	Negative
Heritage		
Cumulative impact on widespread low-density Stone Age lithics	Medium	Negative
Visual		
Short-term landscape change from the current rural agricultural sense of place to the semi-industrial Renewable Energy Landscape.	Medium to Low	Negative
Long Term landscape change from the current rural agricultural sense of place to the semi-industrial Renewable Energy Landscape	Medium	Negative
Short-term landscape change from the removal of the PV structures, followed by rehabilitation of the impacted areas back to agricultural lands.	Low	Neutral
Social		
Visual impacts associated with the establishment of more than one REF and the potential impact on the area's rural sense of place and character of the landscape.	Medium	Negative
The establishment of a number of renewable energy facilities and associated projects, such as the proposed SEF, in the DLM has the potential to place pressure on local services, specifically medical, education and accommodation.	Medium	Negative
The establishment of renewable energy facilities and associated projects, such as the SEF, in the DLM will create employment, skills development and training opportunities, creation of downstream business opportunities.	Medium	Positive

As can be seen in the table above, the majority of cumulative impacts are of medium significance, which is considered to be acceptable on a regional scale. A single high cumulative impact relating to regional losses of natural habitat and subsequent displacement of birds was identified. This impact is however based on the highly unlikely scenario that all the proposed and authorised facilities in proximity to the watershed MTS will be developed. Due to the limited capacity at the Watershed MTS and the highly competitive bid process, it is a reasonable assumption that not all the projects in the area will be developed.

7.9 ASSESSMENT OF THE NO-GO ALTERNATIVE

As required in the 2014 EIA regulations (as amended), this EIR includes an assessment of the assessment of the no go alternative (i.e. the option of not proceeding with the proposed development). This provides details on the impact of the status quo (i.e. the impact and risks associated with the current land use)

The Terrestrial Biodiversity specialist has confirmed that the current land use is predominantly grazing, and the associated impacts caused by this to the terrestrial ecology is considered to be low. However, if this grazing land use is left unmanaged for the foreseeable future, it is probable that the ecological integrity and functioning of the grassland area will deteriorate. Under the current circumstances, the 'no-go' alternative is considered to represent a low long-term negative impact on the environment.

From an Avifaunal perspective, the existing powerlines on site have an impact on the bird species susceptible to collision. The specialist has recommended that all existing powerlines on the property be equipped with Bird Flight Diverters to reduce this existing impact. The no-go alternative would result in this collision risk remaining.

The primary goal of the project is to assist in providing additional capacity to Eskom to assist in addressing the current energy supply constraints. The project also aims to reduce the carbon footprint associated with energy generation. As indicated in the social impact assessment (Annexure E6) energy supply constraints and the associated load shedding have had a significant impact on the economic development of the South African economy. South Africa also relies on coal-powered energy to meet more than 90% of its energy needs. South Africa is therefore one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions. The no-development option would result in the lost opportunity for South Africa to improve energy security and assist to support with the development of clean, renewable energy. The No-Development option would represent a lost opportunity for South Africa to improve energy security and supplement its current energy needs with clean, renewable energy. Given South Africa's current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a significant negative social cost.

7.10 IMPACT SUMMARY

The table below summarises the status and significance of all impacts (with and without mitigation) as assessed in the sections above.

Table 38: Impact Summary of the proposed Themeda PV and associated infrastructure²⁵.

Nature of Impact	Significance / Status Without Mitigation	Significance / Status With Mitigation ²⁶
TERRESTRIAL BIODIVERSITY IMPACTS		
Construction Phase Terrestrial Biodiversity Impacts		
Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community, including protected species	Medium - High Negative	Low Negative
Spread and/or establishment of alien and/or invasive species	Medium Negative	Low Negative

²⁵ The nature and significance of impacts outlined in this section refer to those associated with the preferred alternative.

²⁶ In order to achieve the significance outlined in this column, the EMPr in Appendix H and the mitigation measures outlined in section 8 need to be adopted and implemented.

Nature of Impact	Significance / Status Without Mitigation	Significance / Status With Mitigation²⁶
Displacement of faunal community (possibly including SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, light, dust, vibration)	Medium - High Negative	Low Negative
Chemical pollution associated with dust suppressants	Medium Negative	Low Negative
Operational Phase Terrestrial Biodiversity impacts		
Further Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community, including protected species	Medium Negative	Low Negative
Continued Spread and/or establishment of alien and/or invasive species	Medium Negative	Low Negative
Ongoing Displacement of faunal community (possibly including SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, light, dust, vibration)	Medium Negative	Low Negative
Chemical pollution associated with measures to keep PV clean	Medium Negative	Low Negative
Decommissioning Phase Terrestrial Biodiversity Impacts		
Continued fragmentation and degradation of habitats	Medium Negative	Low Negative
Continued spread of Invasive Alien Plants	Medium Negative	Low Negative
Displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration)	Medium Negative	Low Negative
AVIFAUNAL IMPACTS		
Construction Phase Avifaunal Impacts.		
Losses of natural habitat and displacement of birds through physical transformation, modifications, removals and land clearance. Construction of PV Panels and Associated Infrastructure	High Negative	Medium Negative
Losses of natural habitat and displacement of birds through physical transformation, modifications, removals and land clearance. Access Road (all Alternatives)	Medium Negative	Low Negative
Operational Phase Avifaunal Impacts		
The creation of novel or new avian habitat for commensal bird species or superior competitive species. This is expected to occur during the operation phase of the facility	Low Negative	Low Negative
Avian collision impacts related to the PV facility during the operation phase (collision with the PV panels).	Medium Negative	Low Negative
Decommissioning Phase Avifaunal Impacts		
The Specialist did not identify any avifaunal impacts associated with the closure and decommissioning phase of the development.		
AGRICULTURAL IMPACTS		
Construction Phase Agricultural Impacts		
Change in land use from livestock farming to energy generation	Medium Negative	Medium Negative
Soil erosion	Medium Negative	Low Negative
Soil pollution	Medium Negative	Low Negative

Nature of Impact	Significance / Status Without Mitigation	Significance / Status With Mitigation ²⁶
Operational Phase Agricultural Impacts		
Soil erosion	Medium Negative	Low Negative
Soil pollution	Medium Negative	Low Negative
Decommissioning Phase Agricultural Impacts		
Soil erosion	Medium Negative	Low Negative
Soil pollution	Medium Negative	Low Negative
HERITAGE IMPACTS.		
Construction Phase Heritage Impacts		
Impacts during the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects	Low Negative	Low Negative
Operational Phase Heritage Impacts		
Impacts on surface and sub surface heritage resources occur during the construction phase of the development and persist through all phases, i.e. they are not reversible.		
Closure and Decommissioning Phase Heritage Impacts		
All Impacts on surface and sub surface heritage resources occur during the construction phase of the development and persist through all phases, i.e. they are not reversible.		
VISUAL IMPACTS		
Construction Phase Visual Impacts		
Short-term landscape change from the current rural agricultural sense of place to the semi-industrial Renewable Energy landscape.	Medium Negative	Medium to Low Negative
Operational Phase Visual Impacts		
Long-term landscape change from the current rural agricultural sense of place to the semi-industrial Renewable Energy landscape (Loss of site landscape character due to the operation of the PV structures and associated infrastructure).	Medium Negative	Low Negative
Decommissioning Phase Visual Impacts		
Short-term landscape change from the removal of the PV structures, followed by rehabilitation of the impacted areas back to agricultural lands.	Medium Negative	Low Negative
SOCIAL IMPACTS		
Construction Phase Social Impacts		
Creation of employment and business opportunities during the construction phase.	Medium Positive	Medium Positive
Potential impacts on family structures and social networks associated with the presence of construction workers.	Medium Negative	Low Negative
Potential impacts on family structures, social networks and community services associated with the influx of job seekers.	Low Negative	Low Negative
Potential risk to safety of scholars, farmers and farm workers, livestock and damage to farm infrastructure associated with the presence of construction workers on site.	Medium Negative	Low Negative

Nature of Impact	Significance / Status Without Mitigation	Significance / Status With Mitigation²⁶
Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of grass fires.	Medium Negative	Low Negative
Potential noise, dust and safety impacts associated with construction related activities.	Medium Negative	Low Negative
The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the project etc. will damage farmlands and result in a loss of farmlands for grazing.	Medium Negative	Low Negative
Operational Phase Social Impacts		
Development of infrastructure to improve energy security and support renewable sector.	High Positive	High Positive
Creation of employment and business opportunities associated with the operational phase.	Low Positive	Medium Positive
The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for sheep and farming inputs, such as feed etc.	Low Positive	Medium Positive
Benefits associated with support for local community's form SED contributions.	Medium Positive	High Positive
Visual impact associated with the proposed facility and associated infrastructure and the potential impact on the areas rural sense of place.	Low Negative	Low Negative
Potential impact of the SEF on property values	Low Negative	Low Negative
Potential impact of the SEF on local tourism	Low Negative	Low Negative
Decommissioning Phase Social Impacts		
The social specialist has confirmed that the decommissioning phase social impacts will be largely similar to those associated with the construction phase of the development		
TRAFFIC IMPACTS		
Construction Phase Traffic Impacts		
Increase in Traffic	Medium Negative	Low Negative
Increase of Incidents with pedestrians and livestock	Medium Negative	Low Negative
Increase in Dust from gravel roads	Low Negative	Low Negative
Increase in Road Maintenance	Low Negative	Low Negative
Additional Abnormal Loads	Low Negative	Low Negative
Internal Access Roads (Increase in Dust from gravel roads)	Low Negative	Low Negative
New Larger Access Points	Low Negative	Low Negative

Nature of Impact	Significance / Status Without Mitigation	Significance / Status With Mitigation ²⁶
Operational Phase Traffic Impacts		
Increase in Traffic	Low Negative	Low Negative
Increase of Incidents with pedestrians and livestock	Low Negative	Low Negative
Increase in Dust from gravel roads	Low Negative	Low Negative
Increase in Road Maintenance	Low Negative	Low Negative
Additional Abnormal Loads	Low Negative	Low Negative
New / Larger Access points	Low Negative	Low Negative
Decommissioning Phase Traffic Impacts		
Increase in Traffic	Medium Negative	Low Negative
Increase of Incidents with pedestrians and livestock	Medium Negative	Low Negative
Increase in Dust from gravel roads	Low Negative	Low Negative
Internal Access Roads (Increase in Dust from gravel roads)	Low Negative	Low Negative
Increase in Road Maintenance	Low Negative	Low Negative
Additional Abnormal Loads	Low Negative	Low Negative
New / Larger Access points	Low Negative	Low Negative

7.11 IMPACT STATEMENT

As can be seen in the table above, all impacts associated with the proposed Themeda PV range from **High – positive** to **Medium – Negative** and All Medium – High and High negative Impacts have been avoided by the avoidance of sensitive features or mitigated to acceptable levels.

None of the participating specialists identified any impacts that remain high or very-high after mitigation. The preferred layout (Layout Alternative 2) avoids the main sensitive features, (most notably Visual Agricultural Buffer around the property boundary, the Dense Grassland, ecologically sensitive ridgeline and wetland and associated buffer).

The Terrestrial Biodiversity specialist concluded that there are no fatal flaws are evident for the proposed project and that the average post-mitigation impact significance for the project is moderately low.

The Avifaunal Specialist concluded that no fatal-flaws were identified during the avifaunal assessment, but strongly recommended that the proposed mitigation measures and monitoring protocols (additional pre - and post construction monitoring) be implemented during the lifecycle of the project.

The Agricultural specialist confirmed that the development area consist mostly of shallow Mispah soils underlain by rock that has severe limitations to rainfed crop production and concluded that the project infrastructure will not interfere with the nearby High Potential Agricultural Areas on neighbouring farm portions.

The heritage specialist confirmed that the overall impact of the project is considered to be low due to the low density of artifacts within the site.

The visual specialist has concluded that the proposed development can commence due to its Alignment with National planning related to energy and job creation; Moderated zone of Visual Influence with no tourism activities or tourist view-corridors and limited receptors that are sensitive to landscape change.

The Social specialist concluded that the proposed PV Facility and associated infrastructure will result in several social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. The project will also contribute to local economic development through socio-economic development (SED) contributions. In addition, the development will improve energy security and reduce the carbon footprint associated with energy generation.

The Traffic specialist concluded that the proposed PV will have a nominal impact on the existing traffic network and is deemed acceptable from a transport perspective, provided the recommendations and mitigation measures in this report are implemented.

As such there are no fatal flaws or high post-mitigation impacts that should prevent the development from proceeding. Based on the layout provided for the assessment, Themeda PV can be supported from a terrestrial biodiversity, aquatic biodiversity, avifaunal, visual, social, heritage, agricultural and traffic point of view.

A map showing the proposed activity in relation to the key sensitive features is in attached in Appendix D. All sensitive features along with their appropriate buffers are shown in this plan. As required by the EMPr, all areas outside of the proposed development footprint are to be demarcated as no go areas.

It is Cape EAPrac's reasoned opinion that the preferred Alternative (Layout Alternative 2) can be approval by the competent Authority subject to the outcome of the public participation process and on condition that all the suggested mitigation measures are implemented, all other legislative approvals be obtained, and that the final EMPr be strictly adhered to.

8 MANAGEMENT AND MITIGATION OF IMPACTS

Please refer to the table below, which summarises the mitigation measures recommended by both the Specialists and Cape EAPrac. This table summarises the mitigations, and details whether they should be included as conditions of approval, or whether they have been included as actions in the EMPr. The mitigations reflected in this table must be read in conjunction with the EMPr attached in Appendix H, where the Environmental Impact Management Outcomes and responsible parties for the implementation of these mitigations are provided in more detail (in compliance with appendix 4 of the 2014 EIA regulations).

The table furthermore reflects to which stage of the development the proposed mitigation measures are applicable. In instances where suggested mitigations have already been incorporated into the design phase, they have been reflected as such²⁷.

Table 39: Recommended mitigation measures required for the construction, operation and decommissioning of the proposed Themeda PV development.

²⁷ There are overlapping mitigations suggested by different specialists. In such instances, they have been reflected for each specialist discipline.

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMPr	Construction ²⁸ Phase	Operational Phase	Decommissioning Phase
Terrestrial Biodiversity					
Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible. Brush cutting of vegetation beneath the panels should be, implemented, otherwise controlled grazing by small livestock like sheep. No topsoil stripping or complete vegetation removal beneath the panels. No imported material to be placed under the modules		✓	✓	✓	
Where possible, existing access routes and walking paths must be made use of .		✓	✓	✓	
All laydown, chemical toilets etc. should be restricted to medium sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded. No storage of vehicles or equipment will be allowed outside of the designated project areas.		✓	✓	✓	
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species.		✓		✓	
Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion.		✓		✓	✓
A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment.		✓	✓	✓	✓
A carefully considered surface water/drainage management plan must be developed for the site including attention to the use of environmentally friendly cleaning chemicals for cleaning of panels during the operational phase. No mass herbicide application to be applied beneath modules during operation.		✓	✓	✓	✓
It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants		✓	✓	✓	✓

²⁸ In this instance, the construction phase includes mitigation measures associated with pre-construction and planning.

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMPr	Construction²⁸ Phase	Operational Phase	Decommissioning Phase
A fire management plan needs to be compiled and implemented to restrict the impact fire might have on the surrounding areas.		✓	✓	✓	✓
Rocks removed in the construction phased may not be dumped, but can be used in areas where erosion control needs to be performed		✓		✓	
Any individual of the nationally protected trees or protected plants that was observed needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. Preferably, the trees/plants should be avoided. Hi visibility flags must be placed near any protected plants in order to avoid any damage or destruction of the species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program.		✓	✓	✓	✓
The Solar panel surfaces may not have reflective surfaces which can lead to veld fires		✓		✓	
The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.		✓	✓	✓	
Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals.		✓	✓	✓	
No trapping, killing, or poisoning of any wildlife is to be allowed. Signs must be put up to enforce this.		✓	✓	✓	✓
Try incorporating motion detection lights as much as possible to reduce the duration of illumination. Heights of light columns to be minimised to reduce light spill. Baffles, hoods, or louvres to also be used to reduce light spill.		✓	✓		
Facility lighting during construction & operation should be kept to a minimum and should make use of latest technology to ensure that light disturbance is minimised. This will also reduce the attraction of insects (and in turn insectivorous bats) to the facility. Lighting to be limited to O&M complex and substation. No Perimeter security lighting to be allowed (if perimeter security is a concern, security cameras rather than lighting.)		✓	✓	✓	
Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible.		✓	✓	✓	
All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.		✓	✓	✓	✓

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMPr	Construction ²⁸ Phase	Operational Phase	Decommissioning Phase
Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons.		✓	✓	✓	✓
Heat generated from the substations must be monitored to ensure it does not negatively affect the local fauna		✓	✓	✓	✓
All areas to be developed must be walked through prior to any activity to ensure no nests or fauna species are found in the area. Should any Species of Conservation Concern not move out of the area, or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken.	✓	✓	✓		
Any holes/deep excavations must be dug and planted in a progressive manner; Should the holes overnight they must be covered temporarily to ensure no small fauna species fall in and subsequently inspected prior to backfilling		✓	✓		
Ensure that all AC cables and connections are insulated successfully to reduce electrocution risk.		✓	✓		
Wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.		✓	✓		
Use environmentally friendly cleaning and dust suppressant products.		✓	✓		
Fencing mitigations: <ul style="list-style-type: none"> - Top 2 strands must be smooth wire - Routinely retention loose wires - Minimum 30cm between wires - Place markers on fences 		✓	✓		
Once the development layout has been confirmed, the open areas must be fenced off appropriately pre-construction in order to allow animals to move or be moved into these areas before breaking ground activities occur. Construction activities must take place systemically. The perimeter fence should not be completed -i.e. leaving sections unfenced to allow fauna to escape. Drilling etc should start one side of the site and progress towards the section of the site where fences are incomplete.		✓	✓		
The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprint of the roads must be kept to prescribed widths.		✓	✓	✓	
An alien management plan must be implemented quarterly for 2 years after initial clearing phase.		✓	✓		✓
Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes wetting of exposed soft soil surfaces. No non environmentally friendly suppressants may be used as this could result in pollution of water sources.		✓	✓		✓

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMPr	Construction ²⁸ Phase	Operational Phase	Decommissioning Phase
Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. Refuse bins will be emptied and secured;		✓	✓		
Temporary storage of domestic waste shall be in covered waste skips; and Maximum domestic waste storage period will be 10 days.		✓	✓		
Toilets at the recommended Health and Safety standards must be provided. These should be emptied twice a day, to prevent staff from using the surrounding vegetation		✓	✓		
The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility. Under no circumstances may domestic waste be burned on site		✓	✓		
Refuse bins will be emptied and secured. Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 10 days.		✓	✓		
Suitable temporary solid waste facilities are to be incorporated into the design to prevent unsanitary conditions. These are to be cleared weekly and waste collected by the local waste management department. The residents must be encouraged to recycle.		✓		✓	
All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of Red / Orange List species, their identification, conservation status and importance, biology, habitat requirements and management requirements the Environmental Authorisation and within the EMPr.		✓	✓	✓	✓
Speed limits must be put in place to reduce erosion.		✓	✓	✓	✓
Where possible, existing access routes and walking paths must be made use of.		✓	✓		
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events and strong winds.		✓	✓	✓	
A stormwater management plan must be compiled and implemented.		✓	✓		
A spill response kit must be available at all times. The incident must be reported on and if necessary, a biodiversity specialist must investigate the extent of the impact and provide rehabilitation recommendations.		✓	✓	✓	
Appropriate/Adequate fire management plan need to be implemented.		✓	✓	✓	

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMP	Construction ²⁸ Phase	Operational Phase	Decommissioning Phase
Avifauna					
Concentrate all surface infrastructure on habitat of medium to low avifaunal sensitivity. The development footprint of the various individual facilities must be kept as small as possible and sensitive habitats must be avoided.		✓	✓		
Where possible, existing access roads should be used and the construction of new roads should be kept to a minimum.		✓	✓		
Prevent an overspill of construction activities into areas that are not part of the proposed construction site.		✓	✓		
Use indigenous plant species native to the study area during landscaping and rehabilitation.		✓	✓		
All AC internal electrical reticulation should be placed underground		✓	✓		
Apply bird deterrent devices at selective areas (for example at the corners and middle part of the facility) to the PV panels to discourage birds from colonising the infrastructure or to discourage birds from constructing nests. These could include visual or bio-acoustic deterrents such as highly reflective rotating devices, anti-perching devices such as bird guards, scaring or chasing activities involving the use of trained dogs or raptors and/or netting. Nests should be removed when nest-building attempts are noticed under the guidance of the ECO.		✓	✓	✓	
Reduce or minimise the use of outdoor lighting to avoid attracting birds to the lights or to reduce potential disorientation to migrating birds.		✓		✓	
Use indigenous plant species native to the study area during landscaping and rehabilitation.		✓	✓	✓	
Implement at least an additional bird survey (pre-construction surveys - see section dealing with monitoring and EMP) during the peak wet season to obtain additional quantified data on the occurrence or flyways of waterbird taxa. The data will enable informed decisions regarding the use of deterrent devices.	✓		✓		
Apply systematic reflective/dynamic markers to the boundary fence to increase the visibility of the fence for approaching birds (e.g. korhaan taxa) and to avoid potential bird collisions with the fence structure.	✓		✓		
Install bird guards/spikes above conductors at pylons on existing powerlines on the property		✓	✓		
Fit powerline spans with bird flight diverters to existing powerlines on the property		✓	✓		
All construction sites/areas must be demarcated on site layout plans (preferably), and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the construction sites that are not part of the demarcated development area		✓	✓		

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMPr	Construction²⁸ Phase	Operational Phase	Decommissioning Phase
should be considered as “no-go” areas for employees, machinery or even visitors.					
All road networks must be planned with care to minimise dissection or fragmentation of important avifaunal habitat type. Where possible, the use of existing roads is encouraged.		✓	✓		
Killing or poaching of any bird species should be avoided by means of awareness programs presented to the labour force. The labour force should be made aware of the conservation issues pertaining to the bird taxa occurring on the study site. Any person found deliberately harassing any bird species in any way should face disciplinary measures, following the possible dismissal from the site.		✓	✓	✓	✓
Checks must be carried out at regular intervals to identify areas where erosion is occurring. Appropriate remedial action, including the rehabilitation of eroded areas should be undertaken.		✓	✓	✓	
Open fires is strictly prohibited and only allowed at designated areas.		✓	✓	✓	✓
Agricultural					
Vegetation clearance must be restricted to areas where infrastructure is constructed.		✓	✓		
No materials removed from development area must be allowed to be dumped in nearby livestock farming areas.		✓	✓		
Prior arrangements must be made with the landowners to ensure that livestock and game animals are moved to areas where they cannot be injured by vehicles traversing the area.		✓	✓		
No boundary fence must be opened without the landowners' permission.		✓	✓		
Access to areas outside of the authorised development footprint should be strictly prohibited.		✓	✓		
All left-over construction material must be removed from site once construction on a land portion is completed.		✓	✓		
No open fires made by the construction teams are allowable during the construction phase.		✓	✓		
Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint.		✓	✓		
Unnecessary land clearance must be avoided.		✓	✓		
Level any remaining soil removed from excavation pits (where the PV modules will be mounted) that remained on the surface, instead of allowing small stockpiles of soil to remain on the surface.		✓	✓		

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMPr	Construction²⁸ Phase	Operational Phase	Decommissioning Phase
Where possible, conduct the construction activities outside of the rainy season.		✓	✓		
Stormwater channels must be designed to minimise soil erosion risk resulting from surface water runoff.		✓	✓		
Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills.		✓	✓		
Any waste generated during construction must be stored into designated containers and removed from the site by the construction teams.		✓	✓		
Any left-over construction materials must be removed from site.		✓	✓		
The construction site must be monitored by the Environmental Control Officer (ECO) to detect any early signs of fuel and oil spills and waste dumping.		✓	✓		
Ensure battery transport and installation by accredited staff / contractors.		✓	✓		
Compile (and adhere to) a procedure for the safe handling of battery cells during transport and installation.		✓	✓		
The area around the project, including the internal access roads, must regularly be monitored to detect early signs of soil erosion on-set.		✓		✓	
If soil erosion is detected, the area must be stabilised using geo-textiles and facilitated re-vegetation.		✓		✓	
Maintenance must be undertaken regularly on all vehicles and maintenance machinery to prevent hydrocarbon spills.		✓		✓	
No domestic and other waste must be left at the site and must be transported with the maintenance vehicles to an authorised waste dumping area.		✓		✓	
Heritage					
Implementation of a chance find procedure for the project.		✓	✓		
Monitoring of the project area during construction by the ECO.	✓		✓		
Visual					
To reduce the intensity of cumulative views of multiple projects, a 50m agri-buffer on external property boundary is recommended.	This mitigation is already incorporated into the design of the facility. Please refer to Site Layout Plans in Appendix D.				
Medium sized thornveld trees in this area should be retained, encouraged to grow, and planted to a density of approximately 2 trees per 100m square.		✓	✓	✓	
The area should be fenced off to allow for a continuation of the existing low intensity animal farming. The buffer can include roads, power lines and other infrastructure.		✓	✓		

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMPr	Construction²⁸ Phase	Operational Phase	Decommissioning Phase
The area needs to be managed such that there is no risk from wildfire, and may require tractor-mowing to reduce veld grass growth.		✓	✓		
Continued management of the agri-buffer to ensure that the area does not become fire risk.		✓	✓		
Movement of large vehicles required for the removal of the PV panels, power lines, mono-poles and substations		✓			✓
Rehabilitation of impacted areas to agriculturally viable grasslands.		✓			✓
Social					
Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.		✓	✓		
Where feasible, efforts should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.		✓	✓		
Before the construction phase commences the proponent should meet with representatives from the DLM to establish the existence of a skills database for the area. If such as database exists it should be made available to the contractors appointed for the construction phase.		✓	✓		
The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.		✓	✓		
Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.		✓	✓		
The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.		✓	✓		
The proponent should liaise with the DLM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work.		✓	✓		
The DLM, in conjunction with the local business sector and representatives from the local hospitality industry, should identify strategies aimed at maximising the potential benefits associated with the project.		✓			

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMPr	Construction²⁸ Phase	Operational Phase	Decommissioning Phase
The proponent should consider the option of establishing a Monitoring Forum (MF) in order to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should be established before the construction phase commences, and should include key stakeholders, including representatives from DLM, farmers, and the contractor(s). The MF should also be briefed on the potential risks to the local community associated with construction workers.		✓	✓		
The proponent and the contractor(s) should, in consultation with representatives from the MF, develop a code of conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be dismissed. All dismissals must comply with the South African labour legislation.		✓	✓		
The proponent and the contractor should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase.		✓	✓		
The construction area should be fenced off before construction commences and no workers should be permitted to leave the fenced off area.		✓	✓		
The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contractor to effectively manage and monitor the movement of construction workers on and off the site.		✓	✓		
The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days of their contract coming to an end.		✓	✓		
It is recommended that no construction workers, except for security personnel, should be permitted to stay over-night on the site.		✓	✓		
The proponent should implement a policy that no employment will be available at the gate.		✓	✓		
The proponent should prepare a Stakeholder Engagement Plan (SEP) and Community Health, Safety and Security Plan (CHSSP) prior to commencement of the construction phase.		✓	✓		
The proponent should enter into an agreement with local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.		✓	✓		
Traffic movement and construction related activities should be contained within clearly designated areas.		✓	✓		
Strict traffic speed limits must be enforced.		✓	✓		
All farm gates must be closed after passing through.		✓	✓		

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMPr	Construction²⁸ Phase	Operational Phase	Decommissioning Phase
Contractors appointed by the proponent should provide daily transport for construction workers to and from the site. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties.		✓	✓		
The proponent should hold contractors liable for compensating farmers in full for any stock losses and/or damage to farm infrastructure that can be linked to construction related activities and or workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors, and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities.		✓	✓		
The Environmental Management Plan (EMP) must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested.		✓	✓		
Contractors appointed by the proponent must ensure that construction workers found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation.		✓	✓		
Establishment of a fire break around the construction area before work commences should be investigated.		✓	✓		
Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas.		✓	✓		
Smoking on site should be confined to designated areas.		✓	✓		
Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high-risk dry, windy winter months.		✓	✓		
Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle.		✓	✓		
Contractor should provide fire-fighting training to selected construction staff.		✓	✓		
The movement of construction vehicles on the site should be confined to agreed access road/s.		✓	✓		
The movement of heavy vehicles associated with the construction phase should be timed to avoid times days of the week, such as weekends, when the volume of traffic travelling along the access roads may be higher.		✓	✓		

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMPr	Construction²⁸ Phase	Operational Phase	Decommissioning Phase
Dust suppression measures should be implemented, such as wetting on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.		✓	✓		
All vehicles must be road worthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.		✓	✓		
An Environmental Control Officer (ECO) should be appointed to monitor the construction phase.		✓	✓		
Existing internal roads should be used where possible. In the event that new roads are required, these roads should be rehabilitated on the completion of the construction phase.		✓	✓		
The footprint associated with the construction related activities (access roads, construction camps, workshop etc.) should be minimised.		✓	✓		
All areas disturbed by construction related activities, such as access roads on the site, construction camps etc., should be rehabilitated at the end of the construction phase.		✓	✓		
The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation programme should be included in the EMP.		✓	✓		
The implementation of the Rehabilitation Programme should be monitored by the ECO.		✓	✓		
Implement a skills development and training programme aimed at maximizing the number of employment opportunities for local community members.		✓		✓	
Maximise opportunities for local content, procurement, and community shareholding.		✓		✓	
The enhancement measures listed in SIA, i.e. to enhance local employment and business opportunities during the construction phase, also apply to the operational phase.		✓		✓	
The proponents should liaise with the DLM to identify projects that can be supported by SED contributions.		✓		✓	
Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community.		✓		✓	
Traffic					
Ensure staff transport is done in the 'off peak' periods and by bus, if possible.		✓	✓		
Stagger material, component, and abnormal loads delivery.		✓	✓		

Mitigation Measures Identified by participating specialists.	Condition of Approval	Included in EMPr	Construction ²⁸ Phase	Operational Phase	Decommissioning Phase
Upgrade of existing / new access points.		✓	✓		
Reduction in the speed of vehicles.		✓	✓		
Implementation of pedestrian safety initiatives.		✓	✓		
Regular maintenance of farm fences & access cattle grids.		✓	✓		
Construction of gravel roads in terms of TRH20.		✓	✓		
Implement a road maintenance program under the auspices of the respective transport department.		✓	✓		
Possible use of approved dust suppressant techniques.		✓	✓		
Appropriate, timely and high-quality maintenance required in terms of TRH20.		✓	✓		
Adequate road signage according to the SARTSM.		✓	✓		

9 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 are outlined in the various annexures attached in Appendix F.

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. This public participation plan was approved and the approval thereof is attached in Appendix F9.

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.

9.1 CONSULTATION WITH AUTHORITIES AND ORGANS OF STATE.

In order to comply with this requirement, the proposal is to provide all parties listed in sub sections a, b and c above with access to full digital copies of the Draft Scoping Reports (DSR) and Draft Impact Reports Assessment Reports (DEIR), Draft Environmental Management Programmes (EMPr) 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

9.2 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.

9.3 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 40: 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 - (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;	2 site notices have been at the boundary of the property and the main access point to the property. No deviation or 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 have been 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 has been notified of this environmental process and has been provided with access to the digital copies of the documentation. The Ward Councillors have

Regulated Requirement	Proposed Actions
	been 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 were 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 were 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 were 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. A Further advert, notifying I&AP's of the availability of the Draft EIR was also placed in the same 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 (iii) any other disadvantage.	Notifications have included 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.
(3) A notice, notice board or advertisement referred to in subregulation (2) must - (a) give details of the application or proposed application which is subjected to public participation; and (b) state - (i) whether basic assessment or S&EIR procedures are being applied to the application; (ii) the nature and location of the activity to which the application relates; (iii) where further information on the application or proposed application can be obtained; and (iv) the manner in which and the person to whom representations in respect of the application or proposed application may be made.	All notice boards have been placed in terms of this requirement and no deviation or additional actions in terms of regulation 660 is required.
(4) A notice board referred to in subregulation (2) must - (a) be of a size at least 60cm by 42cm; and (b) display the required information in lettering and in a format as may be determined by the competent authority.	All notice boards have complied with this requirement.

Regulated Requirement	Proposed Actions
<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>	<p>This will be complied with if final reports are produced later in the environmental process.</p>
<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 all relevant authorities agree to such combination of processes.</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"> - Draft Scoping Report - Draft Environmental Impact Report - Draft Environmental Management Programme - All Maps and Plans - All specialist reports that form part of these environmental processes.

9.4 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 was available for a 30 Day review and comment period extending from **24 March 2022 – 26 April 2022**. A copy of these notifications is attached in Annexure F4.

In addition to the notification letters that were sent out to all potential interested and affected parties, state departments and organs of state, a site notice was placed at two positions along the boundary of the site and an advert was placed in "Die Noordwester" newspaper informing potential I&AP's of the availability of the Draft Scoping Reports.



Figure 57: Site Notices Placed on the Boundary of the Property

D Lorenzo Otto was die 'man of the match.'

Hoërskool Lichtenburg se eerste meisie-hokkiespan se wedstryd wat 1 – 1 geëindig het tydens die PUK-reeks by Hoërskool Marais Viljoen is Marze Rall en Nelize Jacobs as 'Man of the match' aangewys.

Die Bloumasjien (1ste span rugby) van Hoërskool Lichtenburg het die kragmeting teen Hoërskool Marais Viljoen met 31 -24 gewen op die tuiskveld van Marais Viljoen. 'Man of the match' was Dries Scheepers en Willem Fourie. Op die foto bring Meyers Olivier sy opponent grond toe.

Stoneham Boerbokstoet
STAAK BOERDERY VEILING
26 MAART 2022
LICHTENBURG SKOUGRONDE | 10:00

800+
Boerbokke

ALLE JONG DOITJES GEËNT-TEEN ENSOOTIESE ABORSIE EN DIE RES VAN KUDDE 'N JAARLIKSE INENTING MET OVI - CLOS P

STOET OOIE 80 + 90 LAMMERS
440 KUDDE OOIE (ALLE STADIA)
113 JONG OOIE (6 MAANDE)
107 RAMME (6 MAANDE)
20 RAMME 2016 - 2020

Vir meer inligting besoek: André Kock & Son Livestock Auctioneer/Estate Agent Facebook Blad.

HENDRE BOTHA : 082 781 0362
CR BOTHA : 079 031 3171
IJ FLEETWOOD : 082 202 4833

LUKAS BURGER-RAMME
WORD IN DIE KUDDE GEBRUIK
ALLE VOLWASSE OOIE REEDS OP STAMBOEK

ANDRÉ KOCK & SON LIVESTOCK AUCTIONEER
053 927 1981

ANDRÉ KOCK & SEUN VERKOOP VOORWAARDES: Rekeninge moet verleen word direk na afloop van veiling. dmv kontant, of bewys van elektroniese betaling voor diere gelaai kan word. Kontakthantingsgeloofsaam gelyk word op alle kontaktramaakies. FICA dokumentasie (10 / passpoort en bewys van verblyf) moet teenwoordig wees om transaksie of te handel.

CDP AANLYN VOORWAARDES: Jie Fiec Dokumentasie met registrasie 2) 24 Aanlynveilingsoptimiseer betaalbaar.

Cape EAPrac
PUBLIC PARTICIPATION PROCESS
Themeda PV and Aristida PV on Portion 7 of the Farm Elandsfontein 34

Scoping and Environmental Impact Reporting Process

Notice is hereby given of a Public Participation Process in terms of the National Environmental Management Act (Act No 107 of 1998) and the National Heritage Resources Act (NHRA)(No.25 of 1999).

Applications for two Scoping and Environmental Impact Reporting processes have been submitted to the National Department of Forestry, Fisheries and the Environment for two Photovoltaic (PV) energy developments (Themeda PV and Aristida PV) on portion 7 of the Farm Elandsfontein 34 near Lichtenburg in the North West Province.

Proponents: Themeda PV (Pty) Ltd & Aristida PV (Pty) Ltd.

Environmental Consultant: Cape EAPrac

Proposal: It is the intention of the proponents, as a Renewable Energy Independent Power Producers to develop 2 x 100MW (MegaWatt) Solar Photovoltaic (PV) Facilities on the abovementioned property, with associated infrastructure including, on site substations, auxiliary buildings, inverter stations, battery energy storage systems, access and internal roads, laydown areas, perimeter fences, security infrastructure and electrical reticulation infrastructure.

The procedures for a Scoping and Environmental Impact Reporting process in terms of the 2014 Regulations are being followed for these projects. The following activities, in terms of Government Notice R983, R984 & R985 may be applicable: GN R983: 11(i), 19(i), 12(xii)(a)(c) GN R984: 1, 2 & 15 GN R985: 4(a)(h)(aa) & 18(a)(h)(aa)

Draft Scoping Reports are available for review and comment from **24 March 2022 – 26 April 2022**. Copies of the Draft Scoping Reports and online registration forms are available on the Cape EAPrac website: www.cape-eaprac.co.za. Should any parties not have access to this online platform, they should contact to Cape EAPrac, who will provide an alternative means to access the available information.

Please Note: When registering as an Interested and Affected Party you consent to the lawful processing of personal information for the intended purposes, as described by the Protection of Personal Information Act, 2013.

Cape EAPrac (Attention: Mr Dale Holder)
 P O Box 2070 George 6530
 Telephone: 044 874 0365 Facsimile: 044 874 0432
 Email: dale@cape-eaprac.co.za

REGISTRATION REQUESTS AND COMMENTS ON THE DRAFT SCOPING REPORTS MUST BE SUBMITTED IN WRITING TO THE DETAILS ABOVE NO LATER THAN 26 APRIL 2022.

Figure 58: Newspaper Advert notifying I&AP's of the Availability of the Draft Scoping Report.

The full copy of the advert as well as additional photographic evidence of the site notices is included in Annexure F3.

9.5 COMMENTS AND RESPONSES ON DRAFT SCOPING REPORT

During the comment period on the Draft Scoping Report, comments were received from the following parties:

- Department of Forestry, Fisheries and the Environments – Integrated Environmental Authorisations
- Department of Forestry, Fishery and the Environment – Conservation and Biodiversity Directorate.
- Department of Forestry, Fishery and the Environment – Forestry Directorate.
- Eskom
- The federation for a sustainable environment.

Copies of these comments are attached in Annexure F5 and the responses thereto are included in Annexure F2.

9.6 AVAILABILITY OF DRAFT SCOPING REPORT

The draft scoping report was available for a 30 day comment period extending from **24 March 2022 – 26 April 2022**. Copies of the report were available at the following locations:

- Cape EAPrac Website: 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.

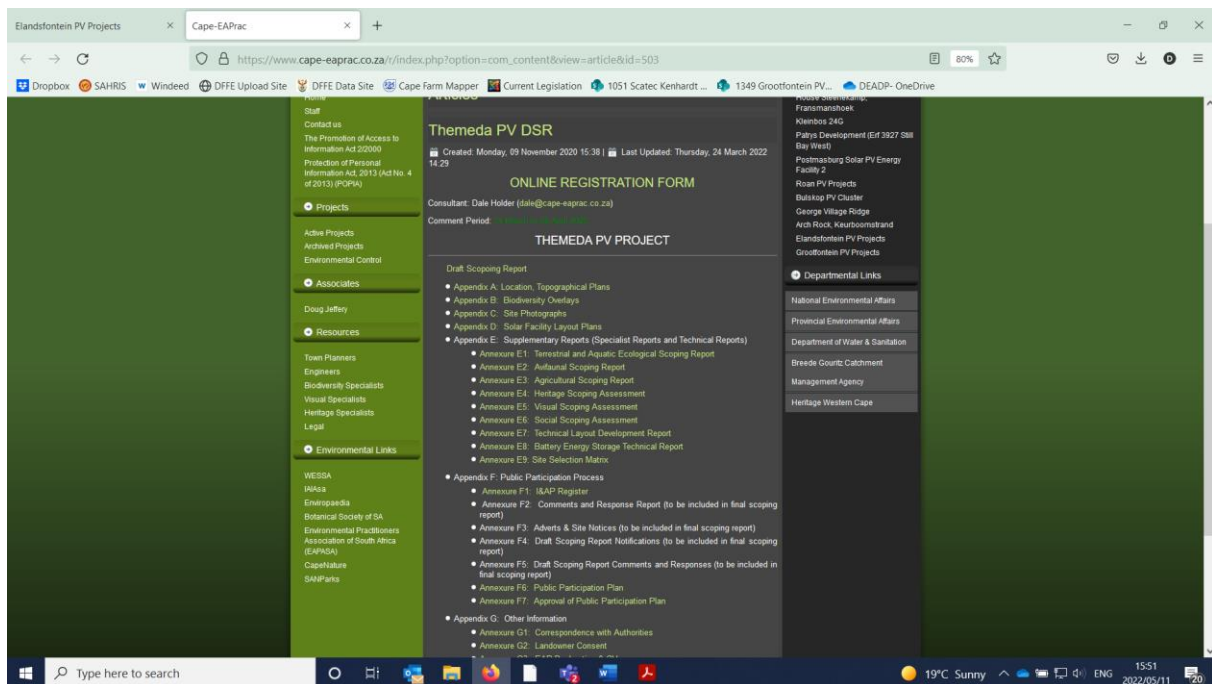


Figure 59: Draft Scoping Report as available on the Cape EAPrac Website.

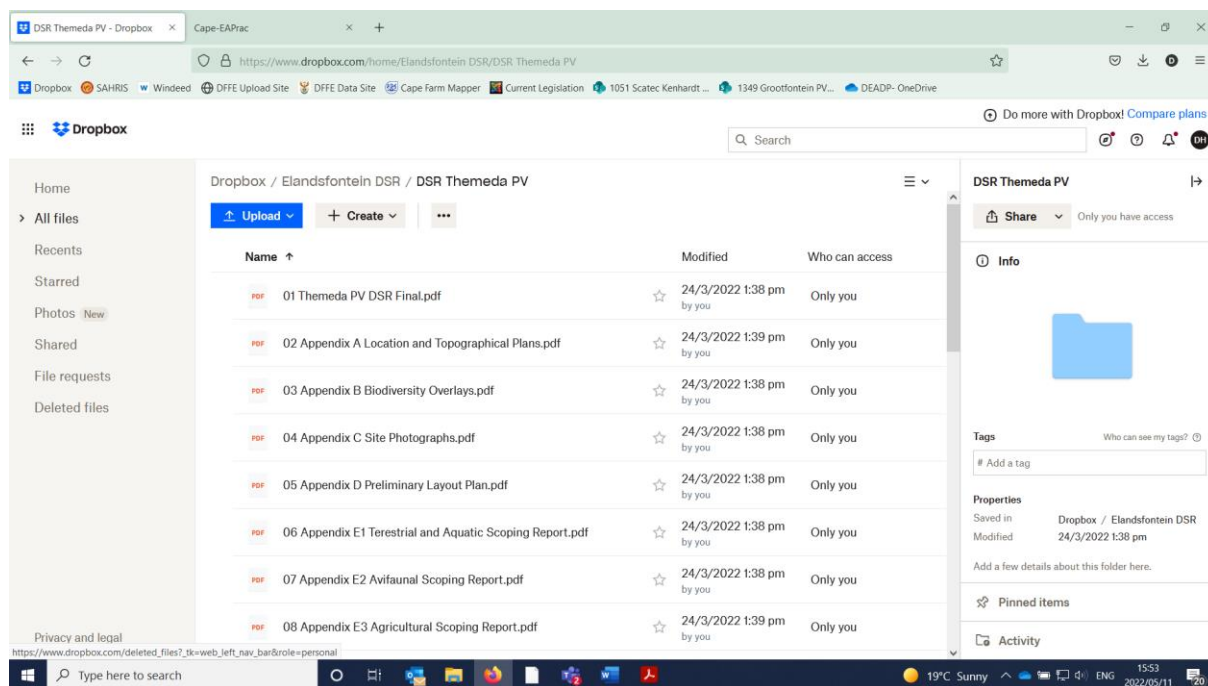


Figure 60: Draft Scoping Report as available via direct download from Dropbox.

Certain I&AP's has issues technical constraints in which they were not able to access Dropbox. In such instances an additional WeTransfer link was provided to these parties.

9.7 AVAILABILITY OF DRAFT ENVIRONMENTAL IMPACT REPORT.

All registered I&AP's were notified of the availability of this Draft Environmental Impact Report for review and comment. In addition to the written notifications of availability, an additional Advert was placed in "Die Noordwester" local newspaper. Further details on the public participation during this Impact Assessment stage of the Environmental Process will be included in the Final Environmental Impact Report that will be submitted to the Competent Authority for consideration and decision making.

10 REMAINDER OF THE ENVIRONMENTAL ASSESSMENT PROCESS

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

- 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.

11 CONCLUSION & RECOMMENDATIONS

This environmental process is currently being undertaken to present proposals to the public and potential I&APs and to identify and assess environmental impacts, issues and concerns raised as a result of the proposed development.

Cape EAPrac is of the opinion that the information contained in this Draft Environmental Report and the documentation attached hereto is sufficient to allow the I&APs to apply their minds to the potential

negative and/or positive impacts associated with the development, in respect of the activities applied for.

This environmental process has not identified any fatal flaws with the proposal and as such it is our reasoned view that the project should be considered for authorisation, subject to the outcome of the public participation process and on condition that all the mitigation measures outlined in section 7 of the report are adopted and implemented. All specialists concur that the development as proposed (Layout Alternative 2) and Access Road Alternative 1 can be considered for approval subject to the implementation of all mitigation measures. All impacts range from high positive to medium negative and all high, very high and critical negative impacts have been avoided by the risk adverse approach or mitigated to acceptable levels.

All stakeholders are requested to review the Draft EIR and the associated appendices, and provide comment, or raise issues of concern, directly to Cape EAPrac within the specified 30-day comment period. All comments received during this comment period will be considered, responded and included in the Final EIR that will be submitted to DFFE for decision making.

It is Cape EAPrac's reasoned opinion that the preferred Alternative (Layout Alternative 2 and Access Road Alternative 1) can be approval by the competent Authority subject to the outcome of the public participation process and on condition that all the suggested mitigation measures are implemented, all other legislative approvals be obtained, and that the final EMPr be strictly adhered to.

12 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
CEMP _r	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
EMP _r	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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²⁹ This list of references does not include the specialist reports attached in annexure E1 – E6.

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